TURNING TOOLS / ROTATING TOOLS / TOOLING SOLUTIONS

MITSUBISHI

MITSUBISHI MATERIALS

2016
2017

C007A



YOUR GLOBAL CRAFTSMAN STUDIO

USING THIS CATALOG

●This catalog was made in JULY 2015.

●Please note that products in this catalog are continuously reviewed and updated. The products therefore may be changed in the future and thus become different from this catalog.

●Stock status is mentioned for the products in this catalog. However, please note that the products here may be replaced by new grades and products in the future.

●Stock status indication

- ● : **Inventory maintained.**
- ○ : **Inventory maintained. (Available Summer 2015)**
- ○ : **Inventory maintained. (Available Winter 2015)**
- ★ : **Inventory maintained in Japan.**
- ▲ : **This item to be discontinued within two years.**
- □ : **Non stock, produced to order only.**

(Note) Please contact us regarding grades and order numbers that are not mentioned in this catalog.

HOW TO USE THIS CATALOG

In this catalog our cutting tools are classified into three main categories, turning tools, milling tools and drilling tools, which are arranged according to types of machining respectively. This helps you to find the most suitable products through some references as follows. Please read the instructions to find the best products for your purpose.

①To find the products through INDEX.

・Turning tools are classified by green coloring.
・Milling tools are classified by blue coloring.
・Drilling tools are classified by red coloring.
For the others, refer to the index on the following title page.

②To find the series of products from the contents of the inside title.

Contents of each block are listed on the inside title.

③To find the product from the classification of each book according to applications.

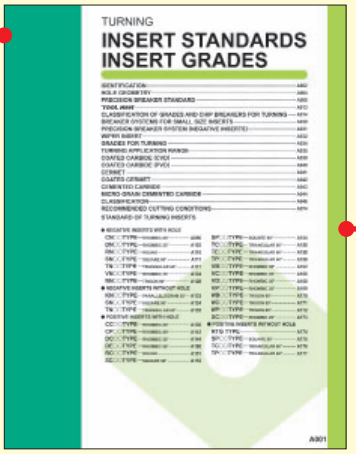
The classification page of each block provides the series of products to be selected according to applications and purposes.

④To find the product through the index of tool numbers on front pages.

In case the tool number of the product or the name of parts are known, refer to the index of tool numbers alphabetically listed on front pages.

⑤How to use the block page.

The usage guide for the section page is shown on the left page of the inside title (not for all sections). Refer to this page to know how to read the product information and how the page is organized.

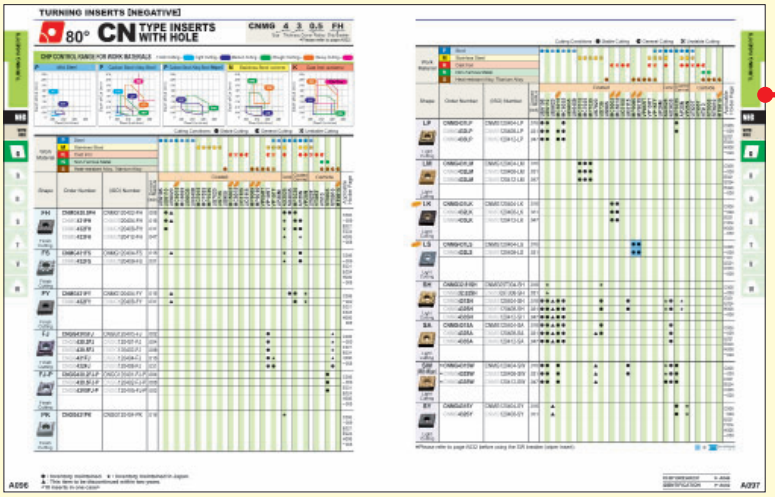


Left Page of the Inside Title Classification coloring for turning tools.

Right Page of the Inside Title Classification coloring for turning inserts.

Inside Title for Turning Inserts

●How the Text and Index are organized



Large Index Product Section

INFORMATION

Web CATALOG : http://www.mitsubishicarbide.net/mmus/en/

★Please refer to page PR17.

CUTTING TOOLS

2016-2017

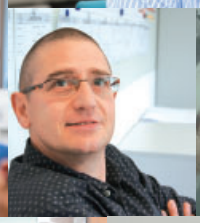
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MITSUBISHI
MITSUBISHI MATERIALS

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Mitsubishi Materials is changing and moving forward.

To get closer to our customers and offer customized solutions to every problem.
To increase customer satisfaction.
To spread our enthusiasm as professional craftsmen.
We have therefore created a new brand message.
Our global family will retain this message in their hearts and minds and will always strive to deliver superior service and solutions meeting our customers' needs.





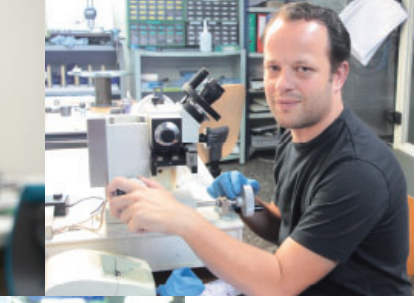








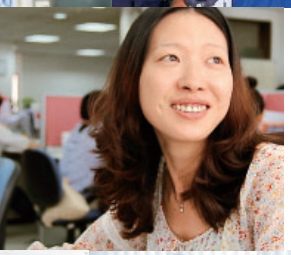










NEW BRAND MESSAGE

YOUR GLOBAL CRAFTSMAN STUDIO

Mitsubishi Materials is not just a tool manufacturer.
We are committed to promptly responding to customers' challenges with the dedication of a professional craftsman and doing our best to actively contribute to their success.
We strive to become the only tool manufacturer globally offering "your personal craftsman studio", a unique service for our customers.

It is the place where you can:

Find state-of-the-art technologies and products.
Find solutions, anytime, anywhere in the world.
Share our excitement on the latest technology trends and product innovation.

It is the studio where we think, share, create and develop together with our customers exciting solutions to meet their specific needs.

YOUR GLOBAL CRAFTSMAN STUDIO
MITSUBISHI MATERIALS

[The meaning of our logo] ▶▶▶
Our logo shows people, standing on a circle, holding hands. The circle represents the earth. Holding hands reflect our commitment to grow and succeed "hand in hand" with our customers and closely work with them improving performance across the globe.
The shape of the logo embodies a variety of ideas. It captures the image of "cutting tools" combined with the dominant letter "M" of the Mitsubishi Materials brand name. It also depicts a flame that symbolizes our passion for craftsmanship.

Available database of cutting tools (ISO 13399 compliance)

1. What is ISO 13399?

International standard with Cutting tool data representation and exchange.
Cutting tools are required to have parameters up to the world standards like in the regulation of the database and CAD data. Another purpose of ISO 13399 is to establish smooth data communication between systems.

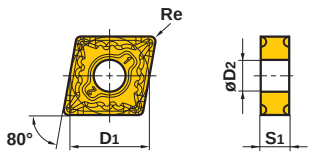
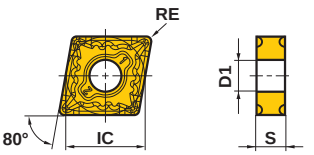
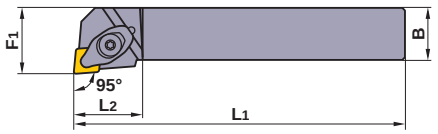
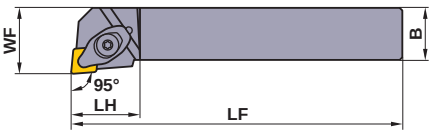
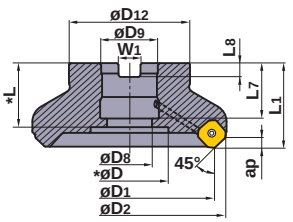
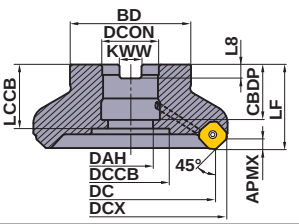
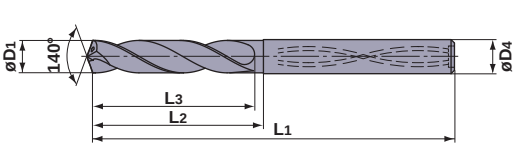
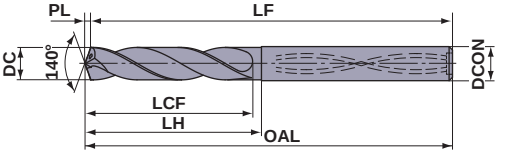
2. Purpose

Troublesome conversion with the manufacturers is unnecessary when you have cutting tool data that complies with ISO 13399. This can then be imported to PLM, CAD, CAM, CNC, or even as a tool management system.
Mitsubishi Materials offers cutting tool data based on ISO 13399 to effectively support improved quality and cost reduction efficiency in your improved threading and new products creation.

3. Dimension symbols conforming to ISO 13399

As shown below, new dimension symbols complying with ISO 13399.

Examples of change in dimensions

	Previous	New
① Inserts		
② Holder		
③ Milling Cutter		
④ Solid Drills		

✱Note 1 See pages 5 to 6 for details.

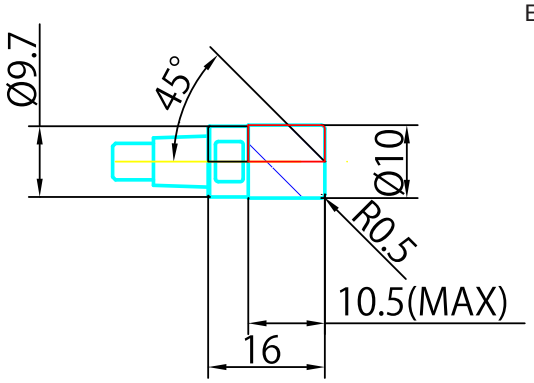
4. CAD (ISO13399 compliance)

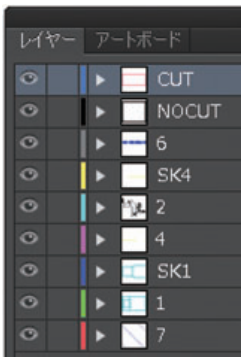
As shown below, DXF (2 dimensions) and STEP (3 dimensions) data complying with ISO 13399 are updated regularly to the Web CATALOG.

①DXF
(Full layer)

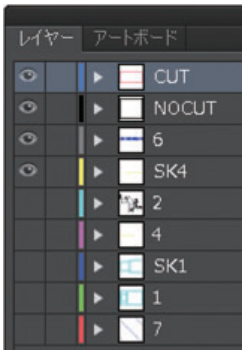
②DXF
(CUT/NO CUT layer)

Ex. IMX10C4HV100R05010

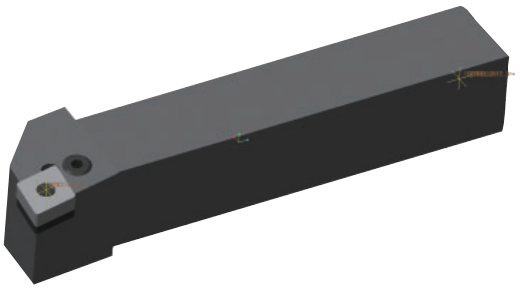


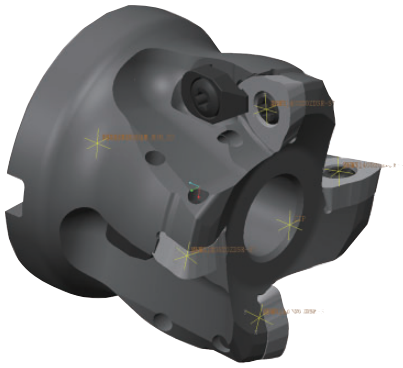




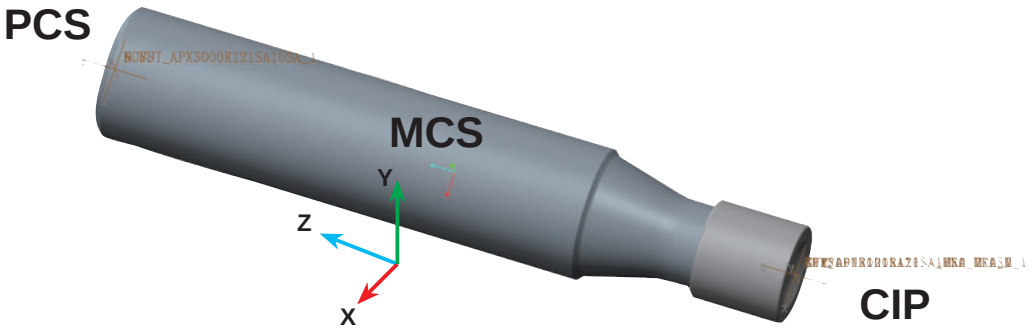


③STEP data (details, insert assembled model)





④STEP data (simple model)



✱Note 2 Download and refer to the "Web CATALOG" of PR17
✱Note 3 CAD is updated regularly. However, in rare cases, it may not be possible to provide the desired product. Please consult us.

Dimensions and symbols (ISO 13399 compliance)

Alphabetical

① Inserts

Symbol	Content
AN	Clearance angle major
AS	Clearance angle wiper edge
BCH	Corner chamfer length
BS	Wiper edge length
CDX	Maximum groove depth
CF	Blade tip
CW	Cutting width
D1	Fixing hole diameter
DC	Cutting diameter
DCON	Fixing part diameter
DMIN	Minimum cutting diameter
DMM	Shank diameter
EDR	Radius honing
EPSR	Insert included angle
FHCSA	Fixing hole countersunk angle
FHCSD	Fixing hole diameter top
GAN	Insert rake angle
IC	Inscribed circle
INSL	Insert length
KAPR	Tool cutting edge angle
KRISN	Cutting edge angle major
L	Cutting edge length
LBB	Breaker width
LE	Cutting edge effective length
LF	Cutting Edge, Length
LU	Usable length
M	m-dimension
PDPT	Overhang
PDX	Profile distance X
PDY	Profile distance Y
PNA	Profile included angle
PSIRL	Cutting edge angle major left hand
PSIRR	Cutting edge angle major right hand
RAL	Relief angle left hand
RAR	Relief angle right hand
RE	Corner radius
S	Thickness
W1	Insert width

② Turning

Symbol	Content
B	Shank width
CDX	Maximum groove depth
CUTDIA	Maximum cut off diameter
DAXN	Axial groove outside diameter minimum
DAXX	Axial groove outside diameter maximum
DCB	Fixing hole diameter
DCON	Fixing part depth
DMIN	Min. Cutting Diameter
DMM	Shank diameter
GAMF	Rake angle normal
H	Shank height
HBH	Head bottom offset height
HBKW	Head back offset width
HF	Functional height
HTB	Body height
KAPR	Cutting edge angle
LB	Body length
LDRED	Neck length
LF	Functional length
LH	Head length
LU	Usable length
OAH	Overall height
OAL	Overall length
OAW	Overall width
PSIR	Lead angle
WF	Functional width

✱Note 1 This symbol complies with TS standard or DTS standard of ISO 13399.
✱Note 2 The above does not include the unset symbols or original Mitsubishi Materials symbols of ISO 13399.
✱Note 3 Changes and additions may be made because the table above also includes symbols under deliberation.

③ Milling

Symbol	Content
APMX	Max. depth of cut
AZ	Plunge depth maximum
BD	Body diameter
BHTA	Neck taper angle
CBDP	Connection bore depth
CRKS	Connection retention knob thread size
DAH	Diameter access hole
DBC	Diameter bolt circle
DC	Cutting diameter
DCB	Fixing hole diameter
DCCB	Fixing bolt seat diameter
DCON	Fixing part depth
DCON_MS	Contact surface diameter machine side
DCON_WS	Contact surface diameter work piece side
DCX	Maximum hole diameter
DHUB	Contact surface diameter
DMM	Shank diameter
DN	Neck diameter
GAMF	Rake angle radial
GAMP	Rake angle axial
KAPR	Tool cutting edge angle
KWW	Keyway width
LCCB	Fixing bolt seat thickness
LE	Cutting edge effective length
LF	Functional length
LH	Neck length
LPCON	Overall head length
LU	Cutting edge length
LUX	Maximum neck length
OAL	Overall length
PRFRAD	Profile radius
PSIR	Lead angle
RMPX	Ramping angle
WT	Weight of item
ZEFP	Peripheral effective cutting edge count

④ Drilling

Symbol	Content
BD	Body diameter
CDN	Front oil filling hole diameter
CNT	Rear oil filling hole diameter
CRKS	Connection retention knob thread size
CZC	Taper size
DC	Cutting diameter
DCFSMS	Flange diameter
DCON	Fixing part depth
DMM	Shank diameter
LCF	Length chip flute
LF	Functional length
LH	Neck length
LPR	Protruding length
LU	Usable length
OAL	Overall length
PL	Point length
SDL	Step diameter length
ZEFP	Peripheral effective cutting edge count

⑤ Others

Symbol	Content
ASP	Adjusting screw protrusion
BD	Body diameter
CRKS	Connection retention knob thread size
CZC	Taper size
DBC	Diameter bolt circle
DC	Cutting diameter
DCB	Fixing hole diameter
DCON	Fixing part diameter
DCON_MS	Contact surface diameter machine side
DCON_WS	Contact surface diameter work piece side
DF	Flange outer diameter
DMM	Shank diameter
FLGT	Flange diameter
HF	Fixing seat dimension
KWW	Keyway width
LB	Body length
LF	Functional length
LP	Overhang
LPR	Distance from end of collar
LS	Shank length
LSCX	Clamping length maximum
LU	Usable length
MHA	Mounting hole angle
MHD	Mounting hole distance
MHH	Mounting hole height
OAL	Overall length
RE	Corner radius
RPMX	Rotational speed maximum

NEW PRODUCTS

MIRACLE SIGMA

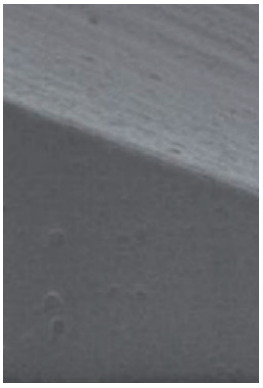
What is MIRACLE SIGMA?

1. Next-generation PVD
2. PVD coating revolution
3. Smooth and sharp edge technology

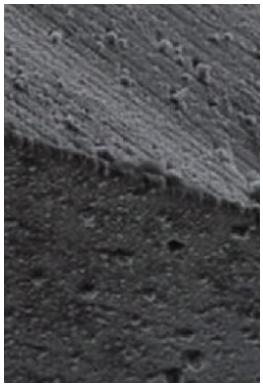
→ Provides Long tool life, high quality, and High efficiency

→ Improved productivity and cost reduction

This new PVD coating added technology offers the next generation of Miracle coating with shape maintainability giving you the MIRACLE SIGMA.
High efficiency offers increased productivity and cost cutting.
The following is an example.



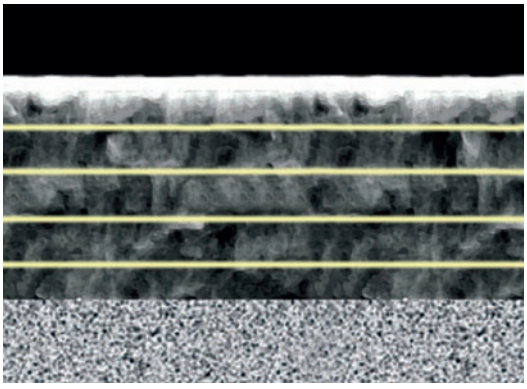
SMART MIRACLE coating



Conventional cutting edge

ZERO-μ

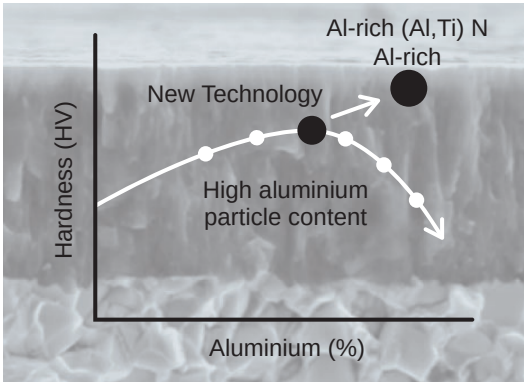
The unique ZERO-μ Surface
Achieves smoothness while retaining sharpness, and provides long tool life.
ZERO-μ also provides a better surface finish, low coefficient of friction, improved chip discharge, and less cutting resistance.



*Multi-layered coating (image)

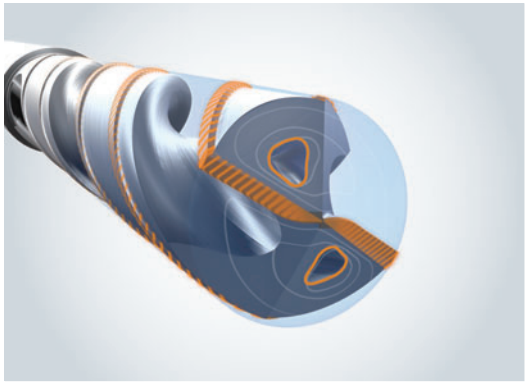
TOUGH-Σ

INNOVATIVE PVD COATING TECHNOLOGY
Extremely tough, smooth, and wear resistant coating provides long tool life and productivity when milling.



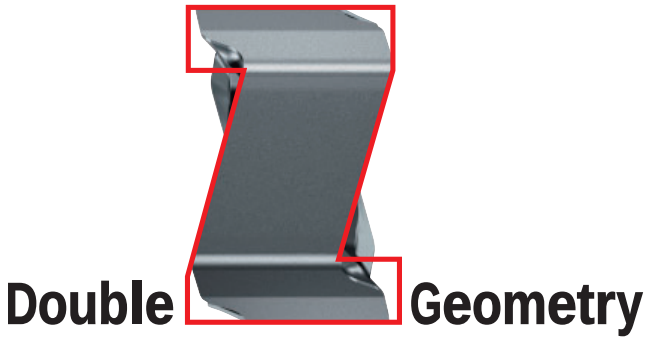
Al-rich (Al,Ti) N

New Al-rich (Al, Ti)N with increased Aluminum content improves film hardness and stabilizes the hardness aspect. Additionally, resistance to wear,abrasion and welding are drastically improved when turning heat resistance alloys.



TRI-cooling Technology®

On drills over ø6mm.
Unique coolant hole shape improves coolant flow and maintains the high hardness aspect to provide long tool life.



Double sided Z Geometry

Unique insert minimizes chatter and vibration. Z Insert Geometry provides lower cutting resistance

Mitsubishi Materials' proprietary double sided, Z Geometry insert features a sharp cutting edge with low cutting resistance by utilizing features from both conventionally positive and negative rake inserts.

✱NOTE 1. MIRACLE SIGMA products are not given the MIRACLE SIGMA mark.

NEW PRODUCTS

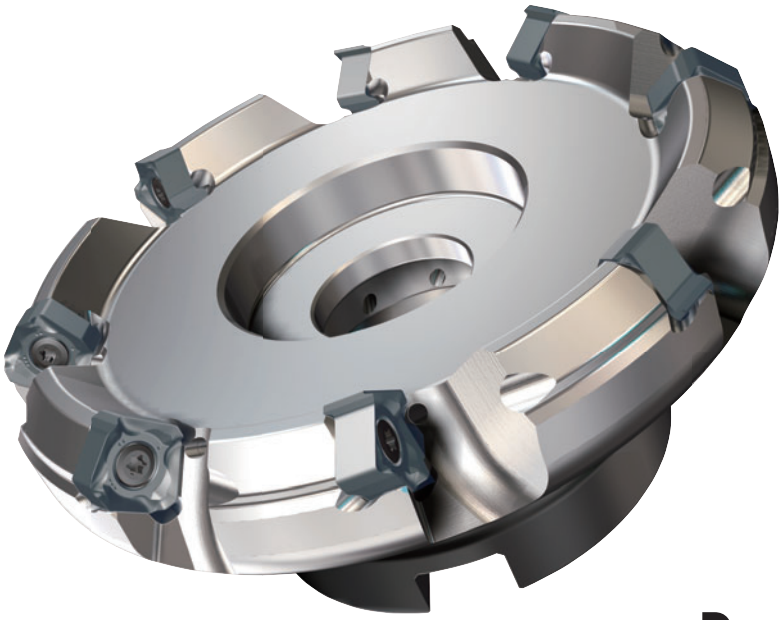
K008

Low cutting resistance and double sided insert face mill for general machining

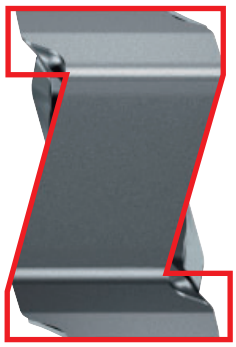
WSX445

Unique geometry minimizes chatter and vibration!

Mitsubishi Materials' proprietary double sided, Z Geometry insert features a sharp cutting edge with low cutting resistance by utilizing features from both conventionally positive and negative rake inserts.







Double Z Geometry

BREAKER SYSTEM

Breaker series for varied depths of cut and feeds

Focus on cutting edge sharpness ← Stable Cutting (Continuous cutting, Without scale, etc.) — Unstable Cutting (Interrupted cutting, With scale, etc.) → **Focus on cutting edge strength**



***L*breaker**

The high rake angle boosts cutting performance. Positive land retains strength and provides low cutting resistance.

***M*breaker**

First recommendation for general applications. A good balance of edge strength and sharpness is provided by the optimized positive land and rake angle.

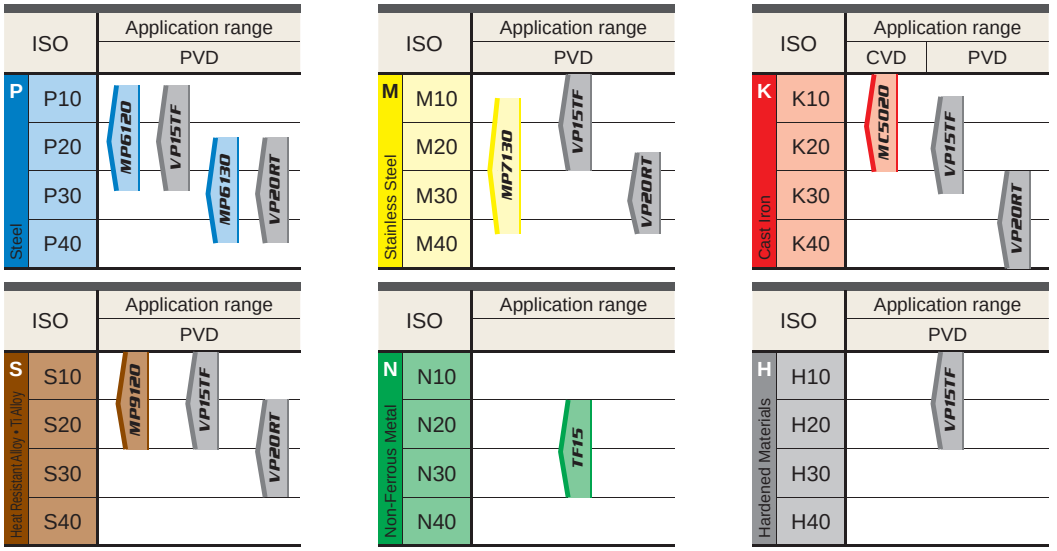
***R*breaker**

For unstable applications. Enhanced edge strength and retention of sharpness is provided by the negative land and positive rake angle respectively.

***H*breaker**

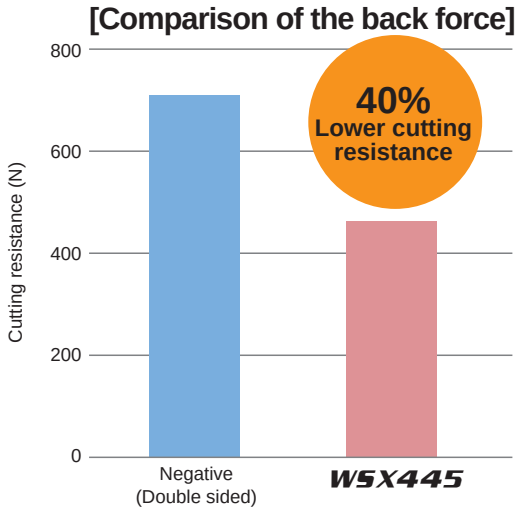
For demanding applications. A stronger land and reduced positive rake angle provides maximum edge strength.

INSERT GRADE FOR A WIDE RANGE OF MATERIALS



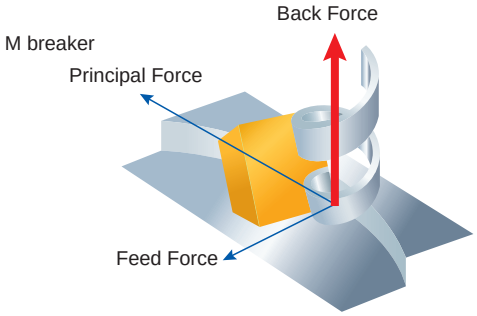
CUTTING RESISTANCE

WSX445's low cutting resistance equals that of single sided insert cutters.The low axial and radial forces reduce vibrations to a minimum.



WSX445
Conventional insert

<Cutting condition>
Work material : AISI 4140
Cutter Dia. : 5 inch
Cutting speed : 655 SFM
Feed per tooth : .008 IPT
Depth of cut : ap= .157 inch
ae= 4 inch
Coolant : Dry cutting,
Single insert



<Back force>
Cutting force in the axial direction. Back force can cause inaccuracy and vibration, resulting in deflection of the work piece as well as cutting tools.

CHIP DISCHARGE EFFECT

WSX445 chips are discharged away from the tool because of the negative/positive design.
This helps to prevent chip jamming and reduce damage to the coolant holes.

WSX445



The chips generated by WSX445 are discharged outwardly as shown here.

Conventional negative insert A



Conventional negative insert B



The chips generated by the milling tool designs above do not discharge properly, pack into the flutes and cause problems.

<Cutting condition>
Work material : AISI 4140
Cutting speed : 490 SFM
Feed per tooth : .008 IPT
Depth of cut : ap= .157 inch
ae= 4 inch
Coolant : Dry cutting

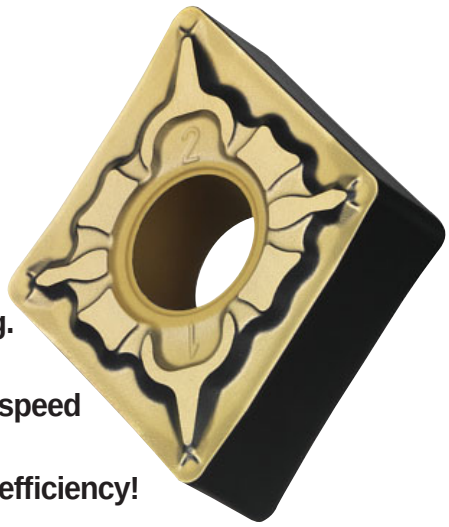
NEW PRODUCTS

A038

P

ISO Turning Inserts for Steels

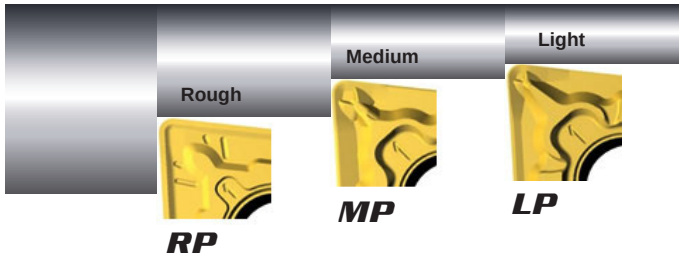
MC6015
MC6025 + **LP**
MP
RP



The beginning of a new high efficiency in steel turning.
Ultra-thick film nano texture TOUGH grip and 2 in 1 technology enables long life without sacrifice to high-speed cutting.
This combination with new breakers vastly increases efficiency!

ISO USE CLASSIFICATION SYMBOLS	APPLICATION RANGE
P01	MC6015
P10	MC6015
P20	MC6025
P30	MC6025
P40	

For General Steel

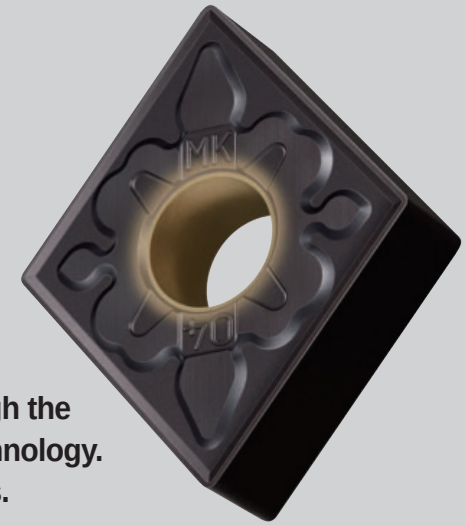


A039

K

ISO Turning Inserts for Cast Iron

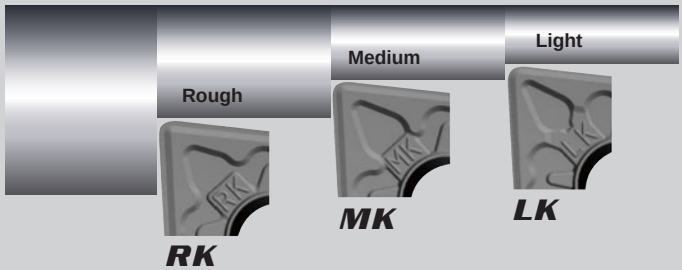
MC5005
MC5015 + **LK**
MK
RK



Reduced cycle time and cost!
High efficiency examples exceeding 1970 SFM cutting velocity appearing one after the other through the use of ultra-thick film nano texture, TOUGH grip technology.
Line up of new breakers selected by load conditions.

ISO USE CLASSIFICATION SYMBOLS	APPLICATION RANGE
K01	MC5005
K10	MC5005
K20	MC5015
K30	MC5015
K40	

For cast iron



M

ISO Turning Inserts for Stainless Steel

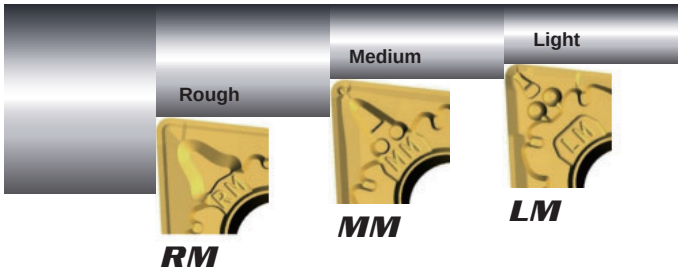
MC7015 MC7025 MP7035 + LM MM RM



Stainless steel turning revolution!
New ultra-hard substrate provides long life and high deformation resistance by controlling boundary wear and burrs.
New breaker with sharpness and strength.

ISO USE CLASSIFICATION SYMBOLS	APPLICATION RANGE
M01	MC7015
M10	MC7015 / MC7025
M20	MC7025
M30	MC7025 / MP7035
M40	MP7035

For Stainless Steel

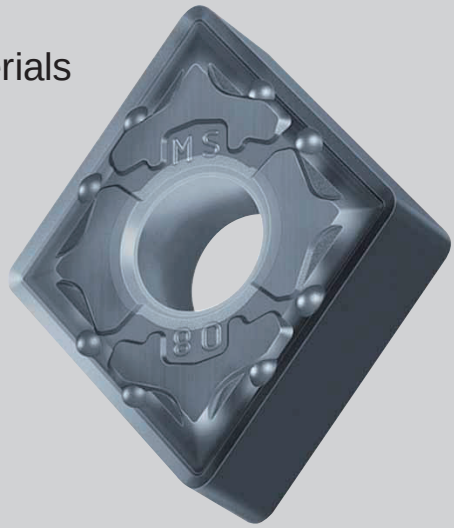


A040

S

ISO Turning Inserts for Difficult-to-Cut Materials

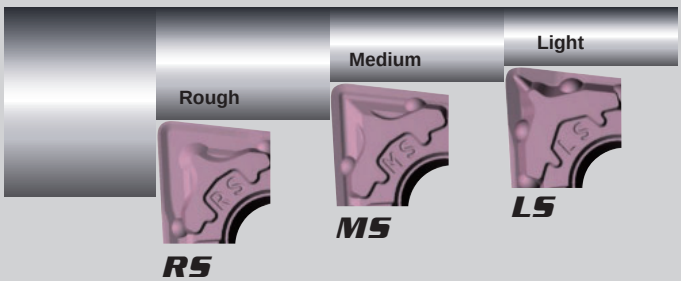
MP9005 MP9015 MT9015 + LS MS RS



Cutting edge boundary fracturing and chipping of high heat resistance alloy turning completely solved!
Al-rich (Al,Ti)N coating realizes improved film hardness and stable high hardness aspect.

ISO USE CLASSIFICATION SYMBOLS	APPLICATION RANGE
S01	MP9005
S10	MP9005 / MP9015
S20	MP9015 / MT9015
S30	MT9015
S40	MT9015

For Super Alloy



NEW PRODUCTS

B004

MIRACLE SIGMA

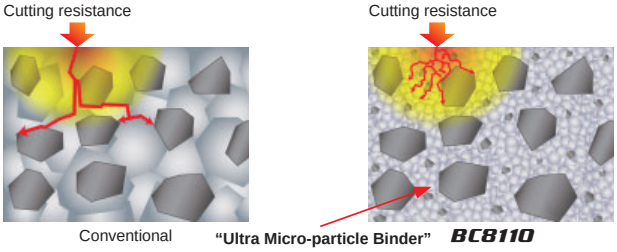
Coated CBN Grade for High Hardened Steel Turning

BC8110

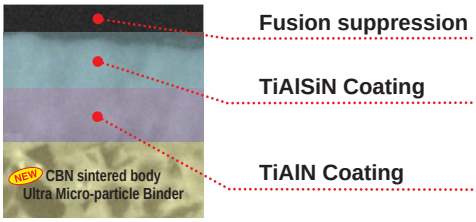


New Generation Coating Technology. Excellent wear resistance provides increased efficiency when turning hardened steels.

The newly developed Ultra Micro-particle Binder prevents sudden fracturing.



Newly developed special ceramic coating



F004

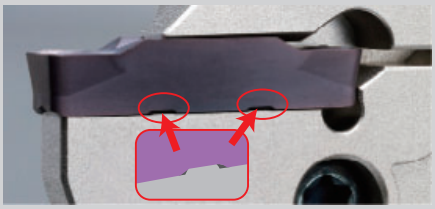
Grooving System

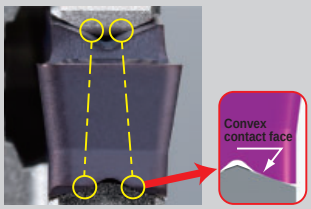
GY Series



Grooving Revolution
Innovative clamping system ensures reliable grooving.
Application expanded

Highly reliable insert clamping





I364

Exchangeable Head End Mills

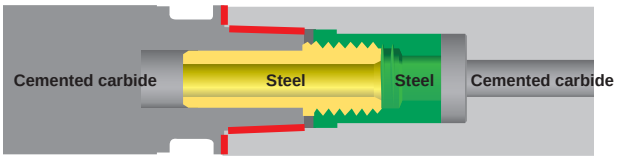
iMX Endmill Series





Carbide head to Carbide holder with Dual contact expands the application possibilities.

Rigidity near that of a solid tool secured by ultra-hardening of all head and holder clamping surfaces.
Several head choices provide high efficiency.



I202

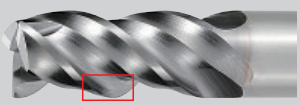
Vibration Control End Mills for Machining Difficult-to-Cut Materials

SMART MIRACLE®

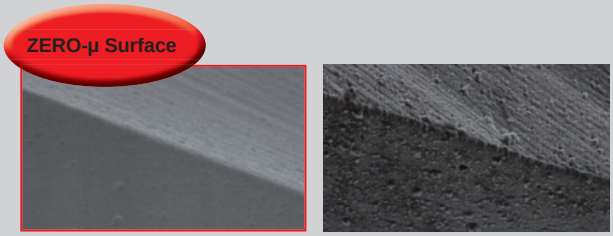




Revolutionary performance for difficult-to-cut materials.



ZERO-μ Surface



SMART MIRACLE coating

Conventional

NEW PRODUCTS

MIRACLE SIGMA

Carbide End Mills

MS plus





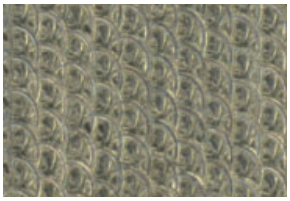
High precision end mills with excellent wear resistance for general machining.

Applicable to finish cutting with improved edge sharpness and cutting edge shape.

MS plus

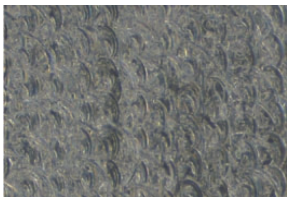


End cutting edge shape



Regular cutting path

Conventional



Unclear cutting path

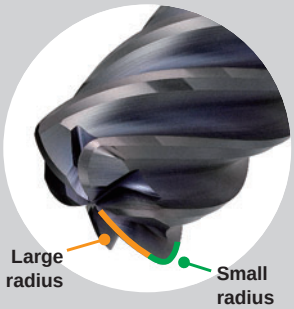
I306

IMPACT MIRACLE

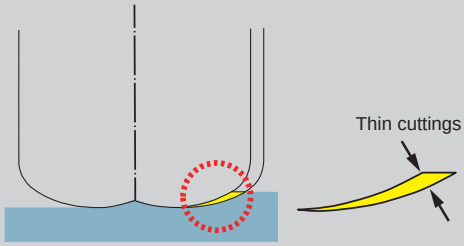
Corner Radius End mill for High Efficiency Machining Series

VFFDRB





High hardness and high efficiency machining realized



Thin cuttings and a long cutting edge combine for high performance and long life.

VFFDRB



Conventional



Reduced cutting resistance in the radial direction suppresses tool vibration and deflection.

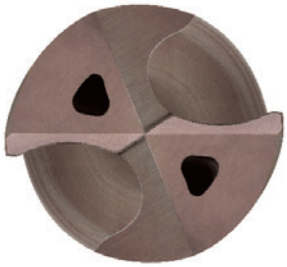
L006

Carbide Solid Drills

WSTAR Drill Series

MVE/MVS

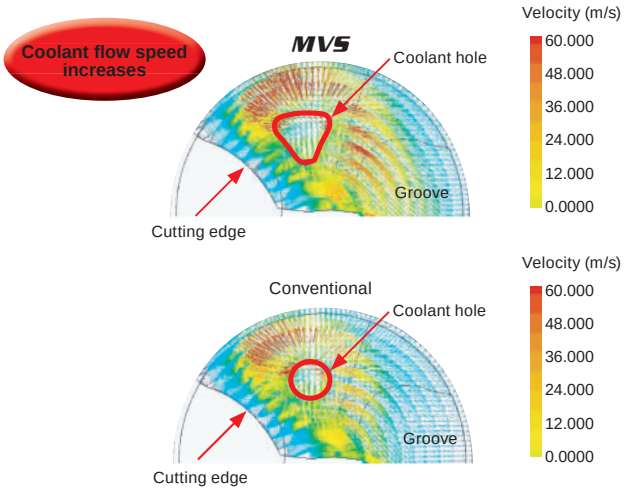




PVD coating provides long tool life for a wide range of applications.

TRI-cooling Technology®

On drills over ø6mm



L168

Indexable Drill

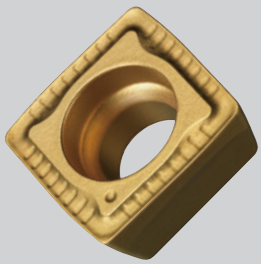
MVX



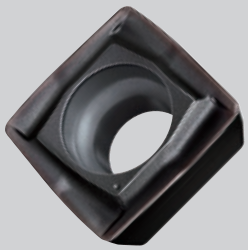


High rigidity body produced by utilizing the cutting-edge technology. Economical 4-corner insert.

Ideal combination of outer CVD insert and inner PVD insert.



All-round UM breaker

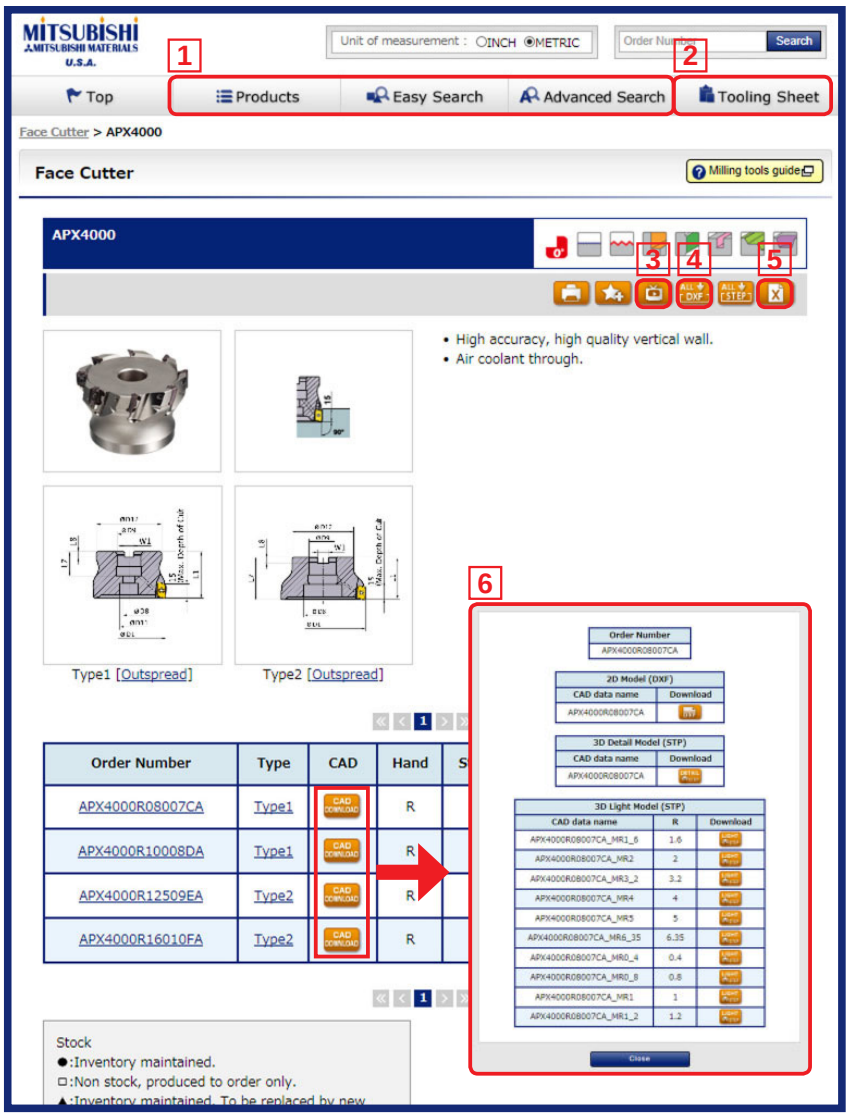


US breaker for Stainless Steel

Mitsubishi Material Web catalog

Web CATALOG

Language: English, Japanese, Chinese, Brazilian Portuguese

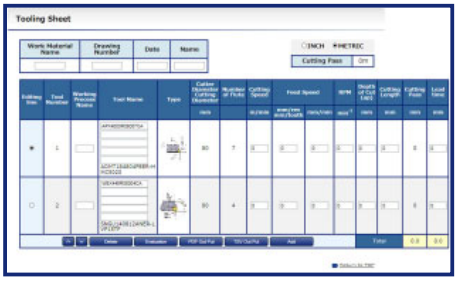


1 Enhanced search function!

Optimum tool can be selected from cutting mode, work, and cutting conditions as well as item number.

2 Tooling sheet mounting

Tooling Sheet "Simple registration in tooling sheet by pressing a button. Cutting time and operation time can be calculated in no time at all"



3 Favorite registration function

Favorite product can be registered.

4 Youtube

Product screen can be viewed.

5 Excel & image data download

Product image and dimensional drawings as well as product information data (excel) can also be downloaded.

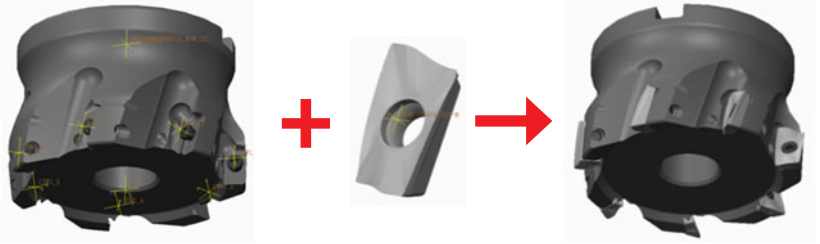
6 ISO 13399 compatible CAD data updated regularly!

ISO 13399 compliance DXF/STEP (simple/detailed) data can be downloaded.

3D simple model (STEP) example



3D detailed model (STEP) example



* CAD is updated regularly. However, in rare cases, it may not be possible to provide the desired product. Please consult us.

Access the Web catalog here.
http://www.mitsubishicarbide.net

e-Learning system

Mitsubishi Materials EXPERT program
You can study cutting technology.

http://mmc-permanent.learnways.com

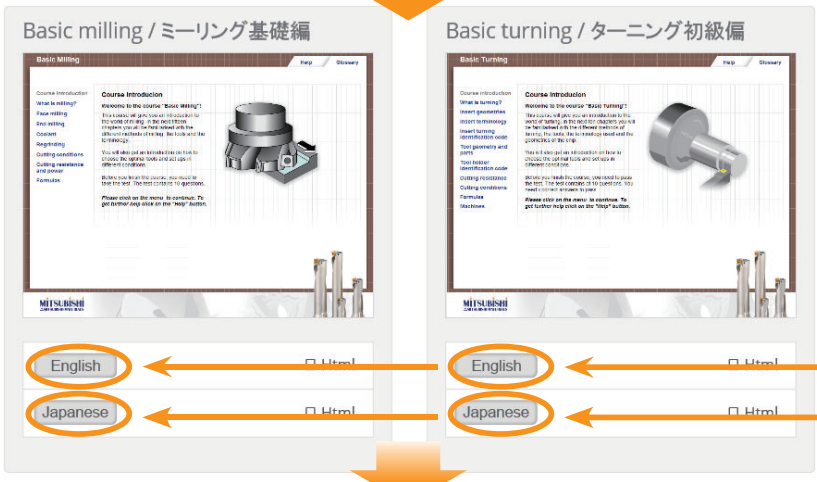
Language: English, Japanese



http://www.mitsubishicarbide.com

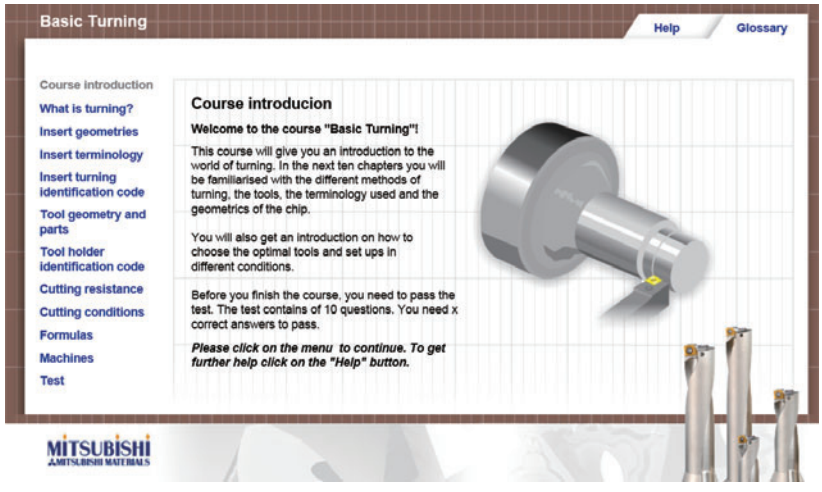
To selection screen of each cutting technology course without the need for registration.





Can participate in milling, turning, drilling, and other courses for free.

●Can select English/Japanese



Can be used on tablet, PC and smart phone for free.



APPLICATION

Cutting Formulas for iOS and Android

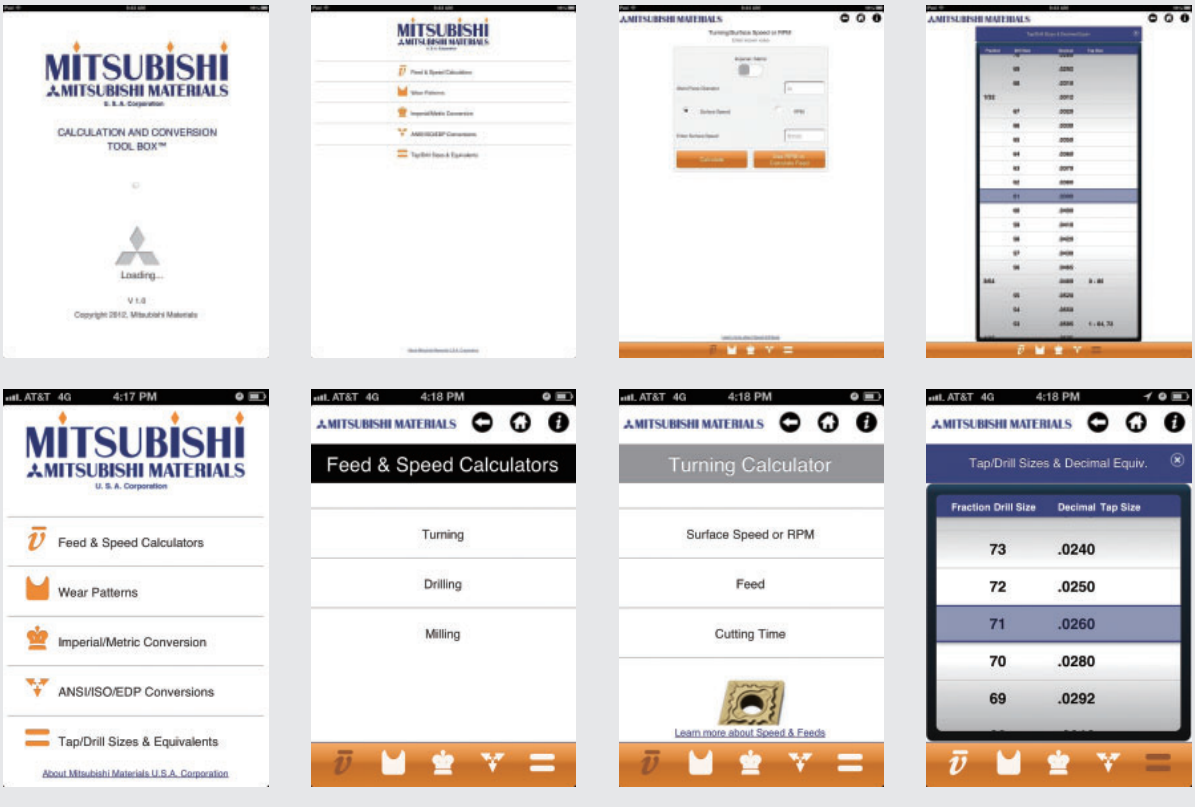
Mitsubishi Materials "Tool Box" app available on i-Tunes and Google play – Free.



Features

- Feed and Speed calculators
- Wear Patterns
- Imperial and Metric conversions
- ANSI / ISO / EDP product conversions
- About Mitsubishi Materials
- Contact us dedicated e-mail address
- Tap / Drill Sizes and Equivalents
- Social Media - You Tube, Twitter and Face Book
- Links to www.mitsubishicarbide.com
- Link to www.mmus.com landing page
- Free app located on i-Tunes app store and Google play for the tablet and mobile Phone
- Simple to use

Image of the screen



This Tool Box app is a visual tool to input values for determining results targeted to help users to estimate speed and feeds, machining time, and other essential calculations.

Download Link!

Download on the App Store

ANDROID APP ON Google play



Welcome to the Chicago Technical Center

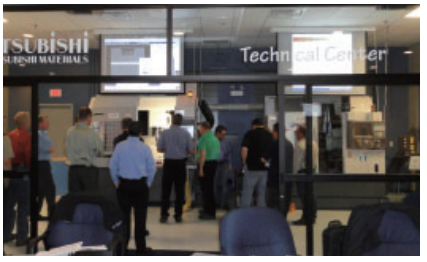
Our purpose is to provide services which satisfy our customers' needs by demonstrating the capabilities of our newest products.

Comfortable classroom for presentations.
In plant, or in office training available for students, customers, distributors and integrators.



Witness the proper application of our newest, most productive, products.

Modern machines for live demonstrations.





Lodging, meals, and ground transportation provided.
Our Technical Center is conveniently located in Schaumburg, IL. For details and registration you may reach us at 800-486-2341, contact your MMUS Sales Repersentative or by email at MarketingServices@mmus.com.

Memo

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INDEX FOR TOOL NUMBER

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APMT○○○○PDER-M○	Insert (For BAP300/400/SRM2 type cutter)	J020,J021,K151,K153,K156
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BC5	Clamp set (For F type boring bar)	M003
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BF-DCGT○○○-○○2	Insert (Class G tolerance)	B039
BF-DNGA○○○-TS2	Insert (Class G tolerance)	B025
BF-DCGW○○○-TS2	Insert (Class G tolerance)	B040
BF-DNGG○○○-TA4	Insert (Class G tolerance)	B024
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TNMG○○○RK	Insert (Class M tolerance)	A123
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TPGH○○○R/LFS	Insert (Class G tolerance)	A159
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TPGT○○○R/LF	Insert (Class G tolerance)	B058
TPGV○○○R/LF	Insert (Class G tolerance)	B059
TPGX○○○	Insert (Class G tolerance)	A161,B043,B059
TPGX○○○R/L	Insert (Class G tolerance)	A160
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WNMG○○○SH	Insert (Class M tolerance)	A129
WNMG○○○SW	Insert (Class M tolerance)	A129
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XDGX1750○○PD○R-GM	Insert (For AXD4000 type cutter)	J019,K069
XDGX1750○○PDFR-GL	Insert (For AXD4000 type cutter)	J019,K069
XDGX2270○○PDFR-GL	Insert (For AXD7000 type cutter)	J019,K077
XNMU160○○○R-○S	Insert (For VFX5 type end mill)	J032,K092
XNMU190○○○R-○S	Insert (For VFX6 type end mill)	J033,K096
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XNS○○○	Clamp screw	M007
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SAFETY OF CUTTING TOOL PRODUCTS

1. Use of Cutting Tool Products

Packages of Mitsubishi products carry a safety warning label. However, tools are not labeled with detailed warning instructions. Please read the "Safety of Cutting Tool Products" in this catalog before handling cutting tool products and cemented carbide materials. Moreover, as a part of your workers' safety education, please notify the contents of the "Safety of Cutting Tool Products" to all workers.

2. Basic Characteristics of Hard Tool Materials

In Terms of "Safety of Cutting Tool Products"

Hard Tool Materials : General term for tool materials like cemented carbide alloy, cermet, ceramics, sintered CBN, sintered diamond, high speed steel and alloy steel, etc.

Physical Characteristics

Appearance : Varies depending on the type of material, e.g. gray, black, gold, etc.

Smell : None

Hardness, Specific Gravity :

Hard Tool Materials	Hardness (HV)	Specific Gravity	Hard Tool Materials	Hardness (HV)	Specific Gravity
High Speed Steel (HSS)	200—1200kg/mm^2	7—9	Sintered CBN	2000—5000kg/mm^2	3—5
Cemented Carbide	500—3000kg/mm^2	9—16	Sintered Diamond	8000—12000kg/mm^2	3—5
Cermet	500—3000kg/mm^2	5—9	Alloy Steel	200—1200kg/mm^2	7—9
Ceramics	1000—4000kg/mm^2	2—7	Diamond Electroforming Product	8000—12000kg/mm^2	3—5

Constituents

Carbide, nitride, carbon nitride, oxide, W, Ti, Al, Si, Ta, B, V and metals such as Fe, Co, Ni, Cr, Mo.

3. Safety of Cutting Tool Products

○Hard tool materials have a large specific gravity. Thus, they require special attention as heavy materials when the size or quantity is large.

○Hard tool materials generates dust and mist during grinding operations or heating. This dust and mist can be harmful to the human body when coming in contact with the eyes or skin, or if substantial quantities are swallowed. When grinding and machining, it is recommended to use local exhaust ventilation and respirators, a dust protective mask, glasses, gloves and so on. If dust makes contact with the hands, thoroughly wash the affected area with soap and water. Don't eat in the exposed area, and wash hands thoroughly before eating. Remove dust from the clothing by a cleaner or washing, but don't shake off.

○Cobalt dust can affect the skin, respiratory organs and heart through repeated or prolonged contact.

○For further information, please refer to MSDS (Material Safety Data Sheet).

Home page: http://www.mitsubishicarbide.com/msds/

4. Handling Cutting Tool Products

○Surface conditions affect toughness of cutting tools. Therefore, use a diamond grinding wheel for finishing.

○Hard tool materials are extremely hard and brittle at the same time. Thus, they may be broken by shock and tightening with excess force.

○Hard tool materials and ferrous materials have different thermal expansion ratios. Shrinkage or swell fit products may suffer from cracks when applied temperature is higher or lower than the appropriate temperature for the tool.

○Pay special attention regarding storing hard tool materials. Toughness of hard tool materials is lowered when they corrode due to coolant and other liquid.

○When brazing hard tool materials, if the temperature is too high or too low from the melting point of the brazing material, loosening and breakage may occur.

○After regrinding cutting tools, make sure that there are no cracks.

○Machining hard tool materials on EDM may cause cracks on the surface due to remaining electrons resulting in lowering the toughness. Eliminate cracks by grinding, etc.

SUGGESTIONS ON HOW TO USE CUTTING TOOLS

Products	Hazard	Countermeasure
All Cutting Tools	◎Cutting tools have sharp cutting edges. Handling them with bare hands may cause injuries.	＊Take precautions such as wearing gloves especially when handling tools and during installation.
	◎Improper use of tools and application of inappropriate cutting conditions may cause the tool to break and be discharged from the machine providing risk of injury.	＊Ensure safety guards and goggles are used. ＊Refer to handling explanatory notes and catalogs. Use tools under recommended cutting conditions.
	◎Impact load and rapid increase of cutting resistance due to excessive wear may cause the tool to break and be expelled from the machine providing risk of injury.	＊Ensure safety guards and goggles are used. ＊Exchange tools before excessive wear occurs.
	◎Cutting tools and workpieces become extremely hot during cutting. Touching them with bare hands may cause burns.	＊Take precautions such as wearing gloves.
	◎Expelled hot chips produced in cutting produces risk of injuries and burns.	＊Ensure safety guards and goggles are used. ＊During swarf removal and machine cleaning ensure the machine is stopped and wear gloves. Please use tools, such as cutting nippers and cutting clippers.
	◎In cutting, sparks, hot chips and heat generation caused by tool breakage provides a risk of igniting a fire.	＊Avoid using cutting tools in places where there is a possibility of igniting a fire. ＊In case of using non-water soluble oil, make sure to have a fire prevention countermeasure.
	◎Using machines, chucks, and tools with poor balance at high revolutions may cause tools to break providing risk of injuries.	＊Ensure safety guards and goggles are used. ＊Check the machine for vibration, chattering, and abnormal noise.
	◎Handling machined parts with burrs using bare hands may cause injuries.	＊Wear gloves.
Indexable Inserts Type Tools	◎If inserts and spare parts are not held securely, they may become loose and be ejected producing risk of injuries.	＊Clean insert locating seat and spare parts before setting inserts. ＊Use the tool provided for setting inserts, and ensure the inserts and spare parts are clamped securely. Do not use the tool provided for things other than prescribed inserts and spare parts.
	◎Clamping inserts and spare parts too tightly by using tools such as extension pipes may cause them to break and be scattered.	＊Do not use extra tools for more leverage. Only use the tool provided.
	◎When applying high cutting speed, spare parts and inserts may be expelled due to centrifugal force. Pay special attention on each safety guidline.	＊Refer to the handling explanatory notes and catalogs. Use tools under recommended cutting conditions.
Cutters and Other Rotating Tools	◎Milling cutters have sharp edges. Handling them with bare hands may cause injuries.	＊Take precautions such as wearing gloves.
	◎Poor balance or off center revolving of tools may cause vibration and chattering which could cause the tool to break and be discharged.	＊Apply cutting speed within the range of recommended cutting conditions. ＊Adjust accuracy and balance of spindles and bearings periodically to prevent off center revolving and chattering caused by wear on these parts.
Drilling Tools	◎Through cutting in cases when the workpiece revolves may produce a disk shaped peice with sharp edges when the cutting tool breaks through.	＊Ensure safety guards and goggles are used. Also install a cover on the chuck.
	◎Drills with an extremely small diameter have a very sharp point which may puncture the skin if not handled carefully. If the drill breaks during cutting, the broken parts may be scattered.	＊Handle with care. Take precautions such as wearing gloves and goggles.
Brazed Tools	◎Weakening of the braze and breakage of inserts may cause injury.	＊Before using them, ensure they are brazed securely. ＊Do not use them under conditions which produce very high temperature.
Others	◎Machine and tools may be damaged if they are used for purposes other than the prescribed application.	＊Use them strictly for the prescribed application.

INFORMATION

This catalog completes the basic precautions for safety use of our company's products. For further information, please refer to the guideline, catalogs or contact us. We are not responsible for any accidents caused by modifying tools without our permission.

GUIDE TO TURNING INSERTS

●Section organization

①Organized according to turning insert shape.
(Refer to the index on the next page.)
②Inserts are arranged in order of :
·Negative inserts (with hole→without hole)
·Positive inserts (with hole→without hole)
③Breakers are arranged in order of :
Finish Cutting→Light Cutting→Medium Cutting
→Rough Cutting→Heavy Cutting

●Graph of chip control by work material

Depicts recommended chip breakers and chip control range according to work material and cutting application. Graphs are colored according to cutting applications (Finish→Light→Medium→Rough→Heavy) and contain recommended breakers for each application.

Finish Cutting : Light Cutting : Medium Cutting :
Rough Cutting : Heavy Cutting :

GRADE APPLICATION RECOMMENDED FOR EACH WORK MATERIAL
cutting conditions suitable for each work materials are shown as a general guide to select grade.
● Stable Cutting ◕ General Cutting ✠ Unstable Cutting

SHAPE & ANGLE MARK

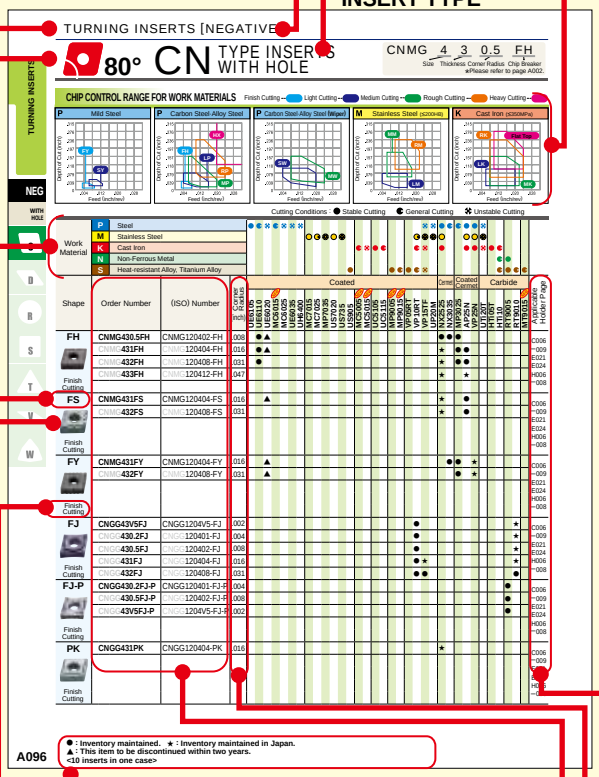
INDICATION OF NEGATIVE/POSITIVE TYPE

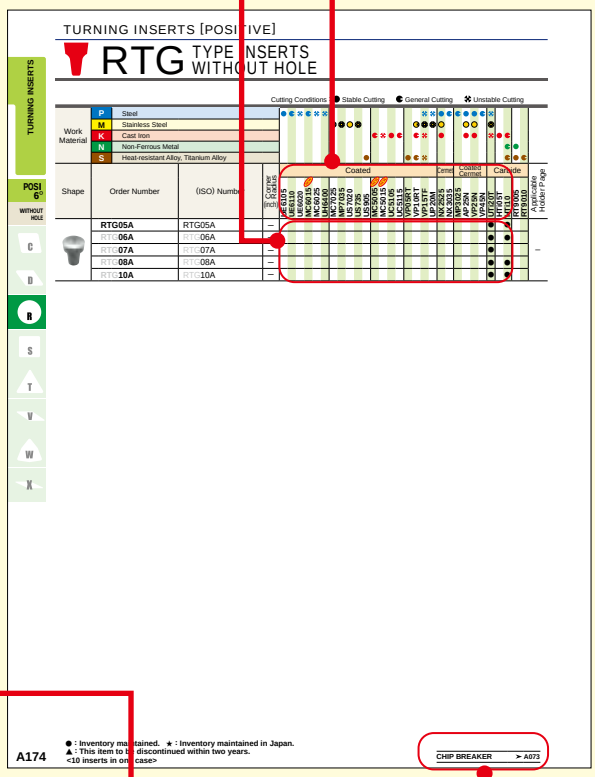
TITLE OF PRODUCT ACCORDING TO THE INSERT TYPE

PRODUCT SECTION

INSERT GRADES

STOCK STATUS





LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

APPLICABLE HOLDER PAGE
indicates reference pages for details of applicable holders.

CUTTING APPLICATION
is shown in order of: Finish→Light →Medium→Rough→Heavy.

PAGE REFERENCE ·IDENTIFICATION
indicates reference pages, on the right hand page of each double-page spread.

PHOTO OF INSERT

INDICATION OF CHIP BREAKER
indicates the designation for a chip breaker.

INSERT CORNER RADIUS (RE)

INSERT NUMBER

●To Order: Please specify insert number and grade.

TURNING

INSERT STANDARDS
INSERT GRADES

IDENTIFICATION A002
HOLE GEOMETRY A004
PRECISION BREAKER STANDARD A008
TOOL NAVI A013
CLASSIFICATION OF GRADES AND CHIP BREAKERS FOR TURNING A014
BREAKER SYSTEMS FOR SMALL SIZE INSERTS A030
PRECISION BREAKER SYSTEM (NEGATIVE INSERTS) A031
WIPER INSERT A032
GRADES FOR TURNING A034
TURNING APPLICATION RANGE A035
COATED CARBIDE (CVD) A038
COATED CARBIDE (PVD) A040
CERMET A041
COATED CERMET A042
CEMENTED CARBIDE A043
MICRO-GRAIN CEMENTED CARBIDE A044
CLASSIFICATION A046
RECOMMENDED CUTTING CONDITIONS A074

STANDARD OF TURNING INSERTS

● NEGATIVE INSERTS WITH HOLE
- CN○○TYPE ··· RHOMBIC 80° A096
- DN○○TYPE ··· RHOMBIC 55° A103
- RN○○TYPE ··· ROUND A110
- SN○○TYPE ··· SQUARE 90° A111
- TN○○TYPE ··· TRIANGULAR 60° A117
- VN○○TYPE ··· RHOMBIC 35° A124
- WN○○TYPE ··· TRIGON 80° A128

● NEGATIVE INSERTS WITHOUT HOLE
- KN○○TYPE ··· PARALLELOGRAM 55° ··· A133
- SN○○TYPE ··· SQUARE 90° A134
- TN○○TYPE ··· TRIANGULAR 60° A135

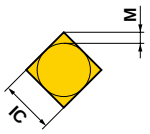
● POSITIVE INSERTS WITH HOLE
- CC○○TYPE ··· RHOMBIC 80° A136
- CP○○TYPE ··· RHOMBIC 80° A142
- DC○○TYPE ··· RHOMBIC 55° A144
- DE○○TYPE ··· RHOMBIC 55° A150
- RC○○TYPE ··· ROUND A151
- SC○○TYPE ··· SQUARE 90° A152
- SP○○TYPE ··· SQUARE 90° A154
- TC○○TYPE ··· TRIANGULAR 60° A155
- TE○○TYPE ··· TRIANGULAR 60° A158
- TP○○TYPE ··· TRIANGULAR 60° A159
- VB○○TYPE ··· RHOMBIC 35° A162
- VC○○TYPE ··· RHOMBIC 35° A166
- VD○○TYPE ··· RHOMBIC 35° A168
- VP○○TYPE ··· RHOMBIC 35° A169
- WB○○TYPE ··· TRIGON 80° A170
- WC○○TYPE ··· TRIGON 80° A171
- WP○○TYPE ··· TRIGON 80° A172
- XC○○TYPE ··· RHOMBIC 25° A173

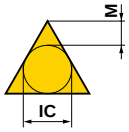
● POSITIVE INSERTS WITHOUT HOLE
- RTG TYPE A174
- SP○○TYPE ··· SQUARE 90° A175
- TC○○TYPE ··· TRIANGULAR 60° A176
- TP○○TYPE ··· TRIANGULAR 60° A177

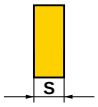
IDENTIFICATION

① Symbol for Insert Shape

Symbol	Insert Shape
H	Hexagonal
O	Octagonal
P	Pentagonal
S	Square
T	Triangular
C	Rhombic 80°
D	Rhombic 55°
E	Rhombic 75°
F	Rhombic 50°
M	Rhombic 86°
V	Rhombic 35°
W	Trigon
L	Rectangular
A	Parallelogram 85°
B	Parallelogram 82°
K	Parallelogram 55°
R	Round
X	Special









Triangular insert with a facet (Secondary Cutting Edge)

③ Symbol for Tolerance Class

Symbol	Tolerance of Nose Height **M** (inch)	Tolerance of Inscribed Circle **IC** (inch)	Tolerance of Thickness **S** (inch)
A	±.0002	±.001	±.001
F	±.0002	±.0005	±.001
C	±.0005	±.001	±.001
H	±.0005	±.0005	±.001
E	±.001	±.001	±.001
G	±.001	±.001	±.005
J	±.002	±.002	±.005
K*	±.0005	±.002 – ±.006	±.001
L*	±.001	±.002 – ±.006	±.001
M*	±.003 – ±.007	±.002 – ±.006	±.005
N*	±.003 – ±.007	±.002 – ±.006	±.001
U*	±.005 – ±.015	±.003 – ±.01	±.005

*As a rule, the sides of these inserts are as sintered. Tolerance differs with insert size. For the accuracy of class M, refer to the table on the right.

Detail of M Class Insert Tolerance

●Tolerance of Nose Height **M** (inch)

I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
.250	±.003	±.003	±.003	±.004	±.0063	–
.375	±.003	±.003	±.003	±.004	±.0063	–
.500	±.005	±.005	±.005	±.006	–	–
.625	±.006	±.006	±.006	±.007	–	–
.750	±.006	±.006	±.006	±.007	–	–
1.000	–	±.007	–	–	–	–
1.250	–	±.008	–	–	–	–

●Tolerance of Inscribed Circle **IC** (inch)

I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
.250	±.002	±.002	±.002	±.002	±.002	–
.375	±.002	±.002	±.002	±.002	±.002	±.002
.500	±.003	±.003	±.003	±.003	–	±.003
.625	±.004	±.004	±.004	±.004	–	±.004
.750	±.004	±.004	±.004	±.004	–	±.004
1.000	–	±.005	–	–	–	±.005
1.250	–	±.006	–	–	–	±.006

③ Symbol for Tolerance Class

	①		③	
INCH	T	N	M	G
METRIC	T	N	M	G
		②		④

② Symbol for Relief Angle

Symbol	Relief Angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Other Relief Angle
Major Relief Angle	

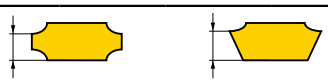
④ Symbol for Chipbreaker and Clamping System

Inch			Metric									
Figure	I.C. .250" and over	I.C. under .250"	Symbol	Hole	Hole Configuration	Chip Breaker	Figure	Symbol	Hole	Hole Configuration	Chip Breaker	Figure
	A	D	W	With Hole	Cylindrical Hole + One Countersink (40—60°)	No		A	With Hole	Cylindrical Hole	No	
	M	P	T	With Hole		One Sided		M	With Hole	Cylindrical Hole	One Sided	
	G	K	Q	With Hole	Cylindrical Hole + Double Countersink (40—60°)	No		G	With Hole	Cylindrical Hole	Double Sided	
	N	E	U	With Hole		Double Sided		N	Without Hole	–	No	
	R	S	B	With Hole	Cylindrical Hole + One Countersink (70—90°)	No		R	Without Hole	–	One Sided	
	F	L	H	With Hole		One Sided		F	Without Hole	–	Double Sided	
Special Design	X	X	C	With Hole	Cylindrical Hole + Double Countersink (70—90°)	No		X	–	–	–	Special Design
			J	With Hole		Double Sided						

Note: Dimension symbols conforming to ISO13399. See pages PR3-PR6 for details.

Inch		Diameter of Inscribed Circle (inch)	Metric						
I.C. .250" and over	I.C. under .250"		R	W	V	D	C	S	T
	1.2 (5)	.156		**02**		**04**	**03**	**03**	**06**
	1.5 (6)	.187		**L3**	**08**	**05**	**04**	**04**	**08**
	1.8 (7)	.219		**03**	**09**	**06**	**05**	**05**	**09**
2		.250		**04**	**11**	**07**	**06**	**06**	**11**
2.5		.313		**05**	**13**	**09**	**08**	**07**	**13**
3		.375	**09**	**06**	**16**	**11**	**09**	**09**	**16**
4		.500	**12**	**08**	**22**	**15**	**12**	**12**	**22**
5		.625		**10**		**19**	**16**	**15**	**27**
6		.750	**19**	**13**		**23**	**19**	**19**	**33**
7		.875				**27**	**22**	**22**	**38**
8		1.000	**25**			**31**	**25**	**25**	**44**
10		1.250	**31**			**38**	**32**	**31**	**54**
		6.00mm	**06**						
		8.00mm	**08**						
		10.00mm	**10**						
		12.00mm	**12**						
		16.00mm	**16**						
		20.00mm	**20**						
		25.00mm	**25**						
		32.00mm	**32**						

⑤ Symbol for Insert Size



Thickness is from the bottom of the insert to the top of the cutting edge.

Inch		Thickness (inch)	Metric
I.C. .250" and over	I.C. under .250"		
–	**0.9**	.055	**S1**
–	**1**	.063	**01**
–	**1.1**	.070	**T0**
–	**1.2**	.078	**T1**
–	**1.5 (3)**	.094	**02**
–	**1.8**	.109	**T2**
2	–	.125	**03**
2.5	–	.156	**T3**
3	–	.187	**04**
3.5	–	.219	**05**
4	–	.25	**06**
5	–	.313	**07**
6	–	.375	**09**

⑥ Symbol for Insert Thickness

⑤	⑥				⑩
4	**3**	**2**	**(E)**	**(N)** -	**MP**
22	**04**	**08**	**(E)**	**(N)** -	**MP**
		⑦	⑧	⑨	

⑦ Symbol for Insert Corner Configuration

Inch	Corner Radius (inch)	Metric
V0	Sharp Nose	**00**
V3	.0012	**V3**
V5	.002	**V5**
0.2	.004	**01**
0.5	.008	**02**
1	.016	**04**
2	.031	**08**
3	.047	**12**
4	.063	**16**
5	.079	**20**
6	.094	**24**
7	.110	**28**
8	.126	**32**
00	Round Insert	**M0**

⑧ Symbol for Cutting Edge Condition

Figure	Cutting Edge	Symbol
	Sharp Cutting Edges	**F**
	Round Cutting Edges	**E**
	Chamfered Cutting Edges	**T**
	Chamfered and Rounded Cutting Edges	**S**

Mitsubishi Materials omit the honing symbol.

⑨ Symbol for Cutting Direction

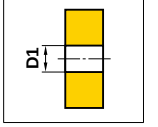
Figure	Hand	Symbol
	Right	**R**
	Left	**L**
	Neutral	**N**

⑩ Symbol for Chip Breaker

LP	**MP**	**RP**
		
LM	**MM**	**RM**
		
LK	**MK**	**RK**
		
LS	**MS**	**RS**
		
FP	**LP**	**MP**
		
MA	**SW**	**MW**
		
HZ	**HX**	**HV**
		

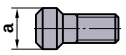
HOLE GEOMETRY

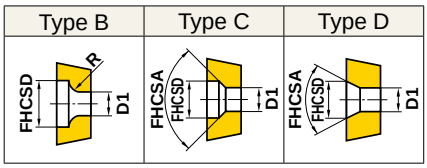
Type A



NEGATIVE

Insert Number		(ISO) Number		Dimension (inch)	Hole Type
				D1	
CNGA CNGG CNMA CNMG CNMM CNMP	32◌ 33◌ 43◌ 54◌ 64◌ 86◌	CNGA CNGG CNMA CNMG CNMM CNMP	0903◌◌ 0904◌◌ 1204◌◌ 1606◌◌ 1906◌◌ 2509◌◌	.150 .150 .203 .250 .312 .359	A A A A A A
DNGA DNGG DNGM DNMA DNMG DNMM DNMX	33◌ 43◌ 44◌	DNGA DNGG DNGM DNMA DNMG DNMM DNMX	1104◌◌ 1504◌◌ 1506◌◌	.150 .203 .203	A A A
SNGA SNGG SNMA SNMG SNMM	32◌ 43◌ 54◌ 64◌ 85◌ 86◌	SNGA SNGG SNMA SNMG SNMM	0903◌◌ 1204◌◌ 1506◌◌ 1906◌◌ 2507◌◌ 2509◌◌	.150 .203 .250 .312 .359 .359	A A A A A A
TNGA TNGG TNMA TNMG TNMM TNMX	22◌ 32◌ 33◌ 43◌ 54◌ 66◌	TNGA TNGG TNMA TNMG TNMM TNMX	1103◌◌ 1603◌◌ 1604◌◌ 2204◌◌ 2706◌◌ 3309◌◌	.089 .150 .150 .203 .250 .312	A A A A A A
VNGA VNGG VNGM VNMG VNMM	33◌	VNGA VNGG VNGM VNMG VNMM	1604◌◌	.150	A
WNMA WNMG	32◌ 32.5◌ 33◌ 43◌	WNMA WNMG	0603◌◌ 06T3◌◌ 0604◌◌ 0804◌◌	.150 .150 .150 .203	A A A A
RNMG	43	RNMG	120400	.203	A

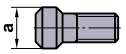


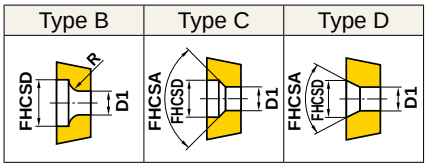


POSITIVE

Insert Number		(ISO) Number		Dimension (inch)			Applicable Screw	Hole Type
				D1	FHCSD	FHCSA (°)		
CCET CCGT CCGW	21.5◌	CCET CCGT CCGW	0602◌◌	.110	.148	R	TS (M2.5) with **a** = .130″	B
	32.5◌		09T3◌◌	.173	.236	R	TS (M4) with **a** = .213″	B
	43◌		1204◌◌	.217	.295	R	TS (M5) with **a** = .268″	B
CCGH CCMH	21.5◌	CCGH CCMH	0602◌◌	.110	.154	R	TS (M2.5) with **a** = .130″	B
CCGT	03S1◌◌	CCGT	03S1◌◌	.079	.114	R	TS (M1.6) with **a** = .098″	B
	04T0◌◌		04T0◌◌	.094	.138	R	TS (M2) with **a** = .106″	B
CCMT	21.5◌	CCMT	0602◌◌	.110	.148	R	TS (M2.5) with **a** = .130″	B
	2.52◌		0803◌◌	.134	.177	R	TS (M3) with **a** = .154″	B
	32.5◌		09T3◌◌	.173	.236	R	TS (M4) with **a** = .213″	B
	43◌		1204◌◌	.217	.295	R	TS (M5) with **a** = .268″	B
CCMW	21.5◌	CCMW	0602◌◌	.110	.148	R	TS (M2.5) with **a** = .130″	B
	32.5◌		09T3◌◌	.173	.236	R	TS (M4) with **a** = .213″	B
	43◌		1204◌◌	.217	.295	R	TS (M5) with **a** = .268″	B
CPGT	2.51.5◌	CPGT	0802◌◌	.134	.177	R	TS (M3) with **a** = .154″	B
	32◌		0903◌◌	.173	.236	R	TS (M4) with **a** = .213″	B
CPMH	2.51.5◌	CPMH	0802◌◌	.138	.209	78°	TS (M3) with **a** = .197″	D
	32◌		0903◌◌	.177	.248	78°	TS (M4) with **a** = .220″	D
CPMT	21.5◌	CPMT	0602◌◌	.110	.148	R	TS (M2.5) with **a** = .130″	B
	32.5◌		09T3◌◌	.173	.236	R	TS (M4) with **a** = .213″	B
CPMX	2.51.5◌	CPMX	0802◌◌	.138	.220	78°	TS (M3) with **a** = .197″	D
	32◌		0903◌◌	.181	.260	80°	TS (M4) with **a** = .220″	D
DCET DCGT DCGW	21.5◌	DCET DCGT DCGW	0702◌◌	.110	.148	R	TS (M2.5) with **a** = .130″	B
	32.5◌		11T3◌◌	.173	.236	R	TS (M4) with **a** = .213″	B
DCMT DCMW	21.5◌	DCMT DCMW	0702◌◌	.110	.148	R	TS (M2.5) with **a** = .130″	B
	32.5◌		11T3◌◌	.173	.236	R	TS (M4) with **a** = .213″	B
	43◌		1504◌◌	.217	.295	R	TS (M5) with **a** = .268″	B
DEGX	43◌	DEGX	1504◌◌	.201	.276	85°	CS (M4.5) with **a** = .248″	C
RCMX	1003M0	RCMX	1003M0	.142	.177	21°		D
	1204M0		1204M0	.165	.209	21°		D
	1606M0		1606M0	.205	.260	21°	for lever lock holder	D
	2006M0		2006M0	.256	.311	21°		D
	2507M0		2507M0	.283	.354	21°		D
	3209M0		3209M0	.374	.457	21°		D

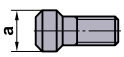
HOLE GEOMETRY

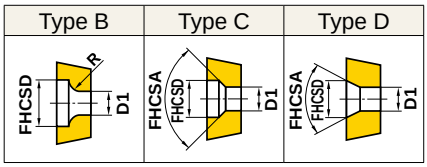




POSITIVE

Insert Number		(ISO) Number		Dimension (inch)			Applicable Screw	Hole Type
				D1	FHCSD	FHCSA (°)		
RCMX	1606M0-○○	RCMX	1606M0-○○	.205	.260	21°		D
	2006M0-○○		2006M0-○○	.256	.311	21°	for lever lock holder	D
	2507M0-○○		2507M0-○○	.283	.354	21°		D
	3209M0-○○		3209M0-○○	.374	.457	21°		D
RCGT RCMT	0602M0	RCGT RCMT	0602M0	.110	.148	R	TS (M2.5) with **a** = .130″	B
	0803M0		0803M0	.134	.177	R	TS (M3) with **a** = .154″	B
	10T3M0		10T3M0	.173	.236	R	TS (M4) with **a** = .213″	B
SCMT SCMW	32.5○	SCMT SCMW	09T3○○	.173	.236	R	TS (M4) with **a** = .213″	B
	43○		1204○○	.217	.295	R	TS (M5) with **a** = .268″	B
SPGX	32○	SPGX	0903○○	.189	.250	58°	TS (M4) with **a** = .213″	C
	42○		1203○○	.232	.303	58°	TS (M5) with **a** = .268″	C
SPMT	32○	SPMT	0903○○	.173	.236	R	TS (M4) with **a** = .213″	B
	42○		1203○○	.217	.295	R	TS (M5) with **a** = .268″	B
SPMW	32○	SPMW	0903○○	.181	.236	R	TS (M4) with **a** = .213″	B
	42○		1203○○	.224	.295	R	TS (M5) with **a** = .268″	B
TCGT	1.21○	TCGT	0601○○	.091	.126	R	TS (M2) with **a** = .106″	B
	21.5○		1102○○	.110	.148	R	TS (M2.5) with **a** = .130″	B
	32.5○		16T3○○	.173	.236	R	TS (M4) with **a** = .213″	B
TCMT	1.51.5○	TCMT	0802○○	.091	.118	R	TS (M2) with **a** = .106″	B
	1.81.5○		0902○○	.098	.130	R	TS (M2.2) with **a** = .118″	B
	21.5○		1102○○	.110	.148	R	TS (M2.5) with **a** = .130″	B
	2.52○		1303○○	.134	.177	R	TS (M3) with **a** = .154″	B
	32.5○		16T3○○	.173	.236	R	TS (M4) with **a** = .213″	B
TCMW	21.5○	TCMW	1102○○	.110	.148	R	TS (M2.5) with **a** = .130″	B
	2.52○		1303○○	.134	.177	R	TS (M3) with **a** = .154″	B
	32.5○		16T3○○	.173	.236	R	TS (M4) with **a** = .213″	B
TEGX	32○	TEGX	1603○○	.169	.238	88°	FC (M4) with **a** = .220″	D
TPGH	1.51.5○	TPGH	0802○○	.094	.157	78°	TS (M2) with **a** = .150″	D
	1.81.5○		0902○○	.114	.169	78°	TS (M2.5) with **a** = .173″	D
	22○		1103○○	.134	.188	78°	TS (M3) with **a** = .189″	D
	32○		1603○○	.173	.254	78°	TS (M4) with **a** = .220″	D
TPGX	1.51.5○	TPGX	0802○○	.098	.150	88°	TS (M2) with **a** = .126″	C
	1.81.5○		0902○○	.118	.169	88°	TS (M2.5) with **a** = .146″	C
	22○		1103○○	.138	.189	88°	TS (M3) with **a** = .161″	C
	32○		1603○○	.189	.250	58°	TS (M4) with **a** = .213″	D





POSITIVE

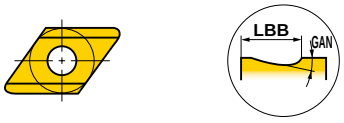
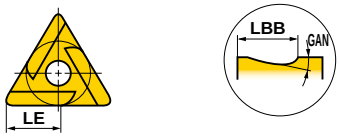
Insert Number		(ISO) Number		Dimension (inch)			Applicable Screw	Hole Type
				D1	FHCSD	FHCSA (°)		
TPMH	1.51.5○	TPMH	0802○○	.098	.157	78°	TS (M2) with **a** = .150″	D
	1.81.5○		0902○○	.114	.169	78°	TS (M2.5) with **a** = .173″	D
	22○		1103○○	.134	.189	78°	TS (M3) with **a** = .189″	D
	32○		1603○○	.173	.254	78°	TS (M4) with **a** = .220″	B
TPMT	1.81.5○	TPMT	0902○○	.098	.130	R	TS (M2.2) with **a** = .118″	B
	21.5○		1102○○	.110	.148	R	TS (M2.5) with **a** = .130″	B
	32.5○		16T3○○	.173	.236	R	TS (M4) with **a** = .213″	B
TPMX	1.81.5○L	TPMX	0902○○L	.126	.169	88°	TS (M2.5) with **a** = .146″	C
	22○L		1103○○L	.146	.189	88°	TS (M3) with **a** = .161″	C
	22○		1103○○	.138	.189	88°	TS (M3) with **a** = .161″	C
VBET	22○	VBET	1103○○	.115	.148	R	TS (M2.5) with **a** = .130″	B
VBGT	22○	VBGT	1103○○	.115	.148	R	TS (M2.5) with **a** = .130″	B
	33○		1604○○	.178	.236	R	TS (M4) with **a** = .213″	B
VBMT	22○	VBMT	1103○○	.115	.149	R	TS (M2.5) with **a** = .130″	B
	33○		1604○○	.178	.238	R	TS (M4) with **a** = .213″	B
VCGT	1.51.5○	VCGT	0802○○	.097	.126	R	TS (M2) with **a** = .106″	B
	33○		1604○○	.173	.236	R	TS (M4) with **a** = .213″	B
	43.57.5		220530	.217	.295	R	TS (M5) with **a** = .268″	B
VCMT	1.51.5○	VCMT	0802○○	.097	.126	R	TS (M2) with **a** = .106″	B
	22○		1103○○	.110	.148	R	TS (M2.5) with **a** = .130″	B
	33○		1604○○	.173	.236	R	TS (M4) with **a** = .213″	B
VCMW	22○	VCMW	1103○○	.110	.148	R	TS (M2.5) with **a** = .130″	B
	33○		1604○○	.173	.236	R	TS (M4) with **a** = .213″	B
VDGX	32○	VDGX	1603○○	.177	.238	88°	FC (M4) with **a** = .220″	D
WBGT	1.21○○	WBGT	0201○○	.091	.126	R	TS (M2) with **a** = .106″	B
	1.51.5○○		L302○○	.091	.126	R	TS (M2) with **a** = .106″	B
WCGT	1.21○○	WCGT	0201○○	.091	.118	R	TS (M2) with **a** = .106″	B
	1.51.5○○		L302○○	.091	.118	R	TS (M2) with **a** = .106″	B
	21.5○		0402○○	.110	.148	R	TS (M2.5) with **a** = .130″	B
	32.5○		06T3○○	.173	.236	R	TS (M4) with **a** = .213″	B
WCMT	1.21○○	WCMT	0201○○	.091	.118	R	TS (M2) with **a** = .106″	B
	1.51.5○○		L302○○	.091	.118	R	TS (M2) with **a** = .106″	B
	21.5○○		0402○○	.110	.148	R	TS (M2.5) with **a** = .130″	B
	32.5○○		06T3○○	.173	.236	R	TS (M4) with **a** = .213″	B
WPGT **WPMT**	21.5○	WPGT WPMT	0402○○	.110	.148	R	TS (M2.5) with **a** = .130″	B
	32○		0603○○	.173	.236	R	TS (M4) with **a** = .213″	B
XCMT	22○	XCMT	1503○○	.110	.148	R	TS (M2.5) with **a** = .138″	B

PRECISION BREAKER STANDARD

STANDARD FOR LEFT AND RIGHT HAND INSERTS

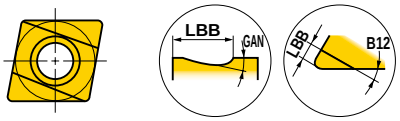
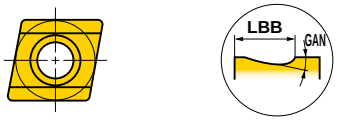
NEGATIVE INSERTS

Unit : inch

Geometry	Insert Number	(ISO) Number	LBB	LE	GAN	B12
 Right hand insert shown.	**DNGG431R/L**	DNGG150404R/L	.110	–	15°	–
	DNGG432R/L	DNGG150408R/L	.110	–	15°	–
 Right hand insert shown.	**SNGG321L**	SNGG090304L	.071	.063	15°	–
	SNGG432R	SNGG120408R	.091	.146	15°	–
 Right hand insert shown.	**TNGG321L**	TNGG160304L	.091	.213	15°	–
	TNGG331L	TNGG160404L	.091	.213	15°	–
	TNGG431R/L	TNGG220404R/L	.110	.370	15°	–

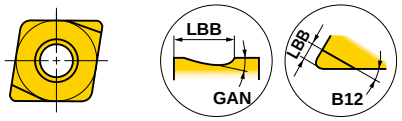
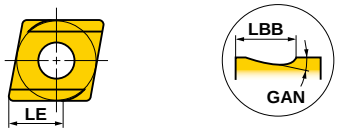
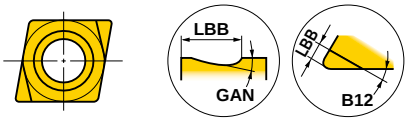
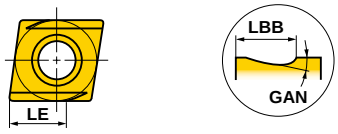
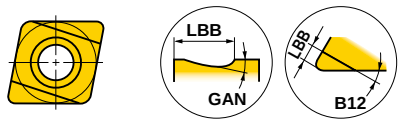
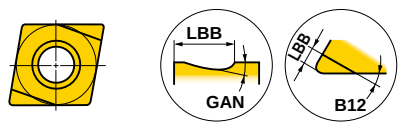
POSITIVE INSERTS

Unit : inch

Geometry	Insert Number	(ISO) Number	LBB	LE	GAN	B12
 Right hand insert shown.	**CCET21.5V3R/LSR**	CCET0602V3R/L-SR	.087	–	30°	20°
	CCET21.50.2R/LSR	CCET060201R/L-SR	.087	–	30°	20°
	CCET21.50.5R/LSR	CCET060202R/L-SR	.087	–	30°	20°
	CCET21.51R/LSR	CCET060204R/L-SR	.087	–	30°	20°
	CCET32.5V3R/LSR	CCET09T3V3R/L-SR	.126	–	30°	20°
	CCET32.50.2R/LSR	CCET09T301R/L-SR	.126	–	30°	20°
	CCET32.50.5R/LSR	CCET09T302R/L-SR	.126	–	30°	20°
	CCET32.51R/LSR	CCET09T304R/L-SR	.126	–	30°	20°
 Right hand insert shown.	**CCET21.5V0R/LSN**	CCET060200R/L-SN	.039	–	20°	–
	CCET21.5V3R/LSN	CCET0602V3R/L-SN	.039	–	20°	–
	CCET21.50.2R/LSN	CCET060201R/L-SN	.039	–	20°	–
	CCET21.50.5R/LSN	CCET060202R/L-SN	.039	–	20°	–
	CCET21.51R/LSN	CCET060204R/L-SN	.039	–	20°	–
	CCET32.5V0R/LSN	CCET09T300R/L-SN	.059	–	20°	–
	CCET32.5V3R/LSN	CCET09T3V3R/L-SN	.059	–	20°	–
	CCET32.50.2R/LSN	CCET09T301R/L-SN	.059	–	20°	–
	CCET32.50.5R/LSN	CCET09T302R/L-SN	.059	–	20°	–
	CCET32.51R/LSN	CCET09T304R/L-SN	.059	–	20°	–
 Right hand insert shown.	**CCET21.5V3R/LWSN**	CCET0602V3R/LW-SN	.039	–	20°	–
	CCET32.5V3R/LWSN	CCET09T3V3R/LW-SN	.059	–	20°	–

POSITIVE INSERTS

Unit : inch

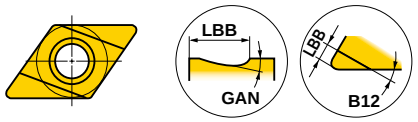
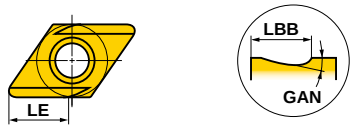
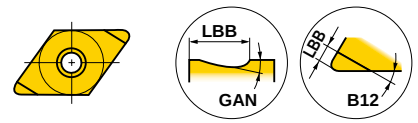
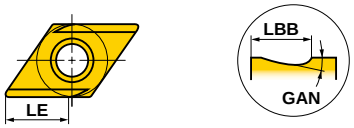
Geometry	Insert Number	(ISO) Number	LBB	LE	GAN	B12
 Right hand insert shown.	**CCGH21.50.5R/LF**	CCGH060202R/L-F	.047	–	15°	20°
	CCGH21.51R/LF	CCGH060204R/L-F	.055	–	15°	20°
 Right hand insert shown.	**CCGT21.5V3RSN**	CCGT0602V3R-SN	.039	.118	20°	–
	CCGT21.50.2R/LSN	CCGT060201R/L-SN	.039	.118	20°	–
	CCGT21.50.5R/LSN	CCGT060202R/L-SN	.039	.118	20°	–
	CCGT32.5V3R/LSN	CCGT09T3V3R/L-SN	.059	.197	20°	–
	CCGT32.50.2R/LSN	CCGT09T301R/L-SN	.059	.197	20°	–
	CCGT32.50.5R/LSN	CCGT09T302R/L-SN	.059	.197	20°	–
	CCGT32.51R/LSN	CCGT09T304R/L-SN	.059	.197	20°	–
 Left hand insert only.	**CCGT03S1V3L-F**	CCGT03S1V3L-F	.031	–	17°	35°
	CCGT03S101L-F	CCGT03S101L-F	.031	–	17°	35°
	CCGT03S102L-F	CCGT03S102L-F	.031	–	17°	35°
	CCGT03S104L-F	CCGT03S104L-F	.031	–	17°	35°
	CCGT04T0V3L-F	CCGT04T0V3L-F	.039	–	17°	35°
	CCGT04T001L-F	CCGT04T001L-F	.039	–	17°	35°
	CCGT04T002L-F	CCGT04T002L-F	.039	–	17°	35°
	CCGT04T004L-F	CCGT04T004L-F	.039	–	17°	35°
 Right hand insert shown.	**CCGT21.5V3R/LSS**	CCGT0602V3R/L-SS	.039	.118	14°	–
	CCGT21.50.2R/LSS	CCGT060201R/L-SS	.039	.118	14°	–
	CCGT21.50.5R/LSS	CCGT060202R/L-SS	.039	.118	14°	–
	CCGT32.5V3R/LSS	CCGT09T3V3R/L-SS	.039	.197	14°	–
	CCGT32.50.2R/LSS	CCGT09T301R/L-SS	.039	.197	14°	–
	CCGT32.50.5R/LSS	CCGT09T302R/L-SS	.039	.197	14°	–
 Right hand insert shown.	**CPGT2.51.51R/LF**	CPGT080204R/L-F	.071	–	15°	20°
	CPGT320.5R/LF	CPGT090302R/L-F	.071	–	15°	20°
	CPGT321R/LF	CPGT090304R/L-F	.071	–	15°	20°
 Right hand insert shown.	**CPMH2.51.51R/LF**	CPMH080204R/L-F	.039	–	15°	20°
	CPMH321R/LF	CPMH090304R/L-F	.055	–	15°	20°

PRECISION BREAKER STANDARD

STANDARD FOR LEFT AND RIGHT HAND INSERTS

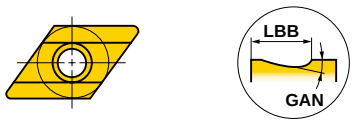
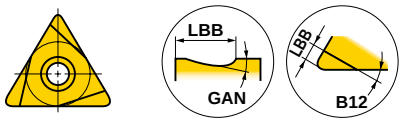
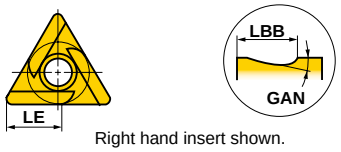
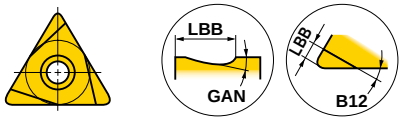
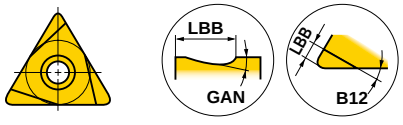
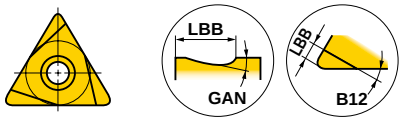
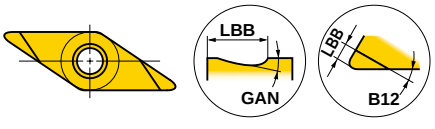
POSITIVE INSERTS

Unit : inch

Geometry	Insert Number	(ISO) Number	LBB	LE	GAN	B12
 Right hand insert shown.	**DCET21.5V3R/LSR**	DCET0702V3R/L-SR	.098	–	30°	20°
	DCET**21.50.2R/LSR**	DCET070201R/L-SR	.098	–	30°	20°
	DCET**21.50.5R/LSR**	DCET070202R/L-SR	.098	–	30°	20°
	DCET**21.51R/LSR**	DCET070204R/L-SR	.098	–	30°	20°
	DCET**32.5V3R/LSR**	DCET11T3V3R/L-SR	.146	–	30°	20°
	DCET**32.50.2R/LSR**	DCET11T301R/L-SR	.146	–	30°	20°
	DCET**32.50.5R/LSR**	DCET11T302R/L-SR	.146	–	30°	20°
	DCET**32.51R/LSR**	DCET11T304R/L-SR	.146	–	30°	20°
 Right hand insert shown.	**DCET21.5V0R/LSN**	DCET070200R/L-SN	.039	–	20°	–
	DCET**21.5V3R/LSN**	DCET0702V3R/L-SN	.039	–	20°	–
	DCET**21.50.2R/LSN**	DCET070201R/L-SN	.039	–	20°	–
	DCET**21.50.5R/LSN**	DCET070202R/L-SN	.039	–	20°	–
	DCET**21.51R/LSN**	DCET070204R/L-SN	.039	–	20°	–
	DCET**32.5V0R/LSN**	DCET11T300R/L-SN	.059	–	20°	–
	DCET**32.5V3R/LSN**	DCET11T3V3R/L-SN	.059	–	20°	–
	DCET**32.50.2R/LSN**	DCET11T301R/L-SN	.059	–	20°	–
	DCET**32.50.5R/LSN**	DCET11T302R/L-SN	.059	–	20°	–
	DCET**32.51R/LSN**	DCET11T304RL-SN	.059	–	20°	–
 Right hand insert shown.	**DCET21.5V3R/LWSN**	DCET0702V3R/LW-SN	.039	–	20°	–
	DCET**32.5V3R/LWSN**	DCET11T3V3R/LW-SN	.059	–	20°	–
 Right hand insert shown.	**DCGT21.5V3RSN**	DCGT0702V3R-SN	.039	.138	20°	–
	DCGT**21.50.2RSN**	DCGT070201R-SN	.039	.138	20°	–
	DCGT**21.50.5R/LSN**	DCGT070202R/L-SN	.039	.138	20°	–
	DCGT**32.5V3R/LSN**	DCGT11T3V3R/L-SN	.059	.256	20°	–
	DCGT**32.50.2R/LSN**	DCGT11T301R/L-SN	.059	.256	20°	–
	DCGT**32.50.5R/LSN**	DCGT11T302R/L-SN	.059	.256	20°	–
	DCGT**32.51R/LSN**	DCGT11T304R/L-SN	.059	.256	20°	–
 Right hand insert shown.	**DCGT21.50.5R/LF**	DCGT070202R/L-F	.039	–	17°	20°
	DCGT**21.51R/LF**	DCGT070204R/L-F	.039	–	17°	20°
	DCGT**32.50.5R/LF**	DCGT11T302R/L-F	.039	–	14°	20°
	DCGT**32.51R/LF**	DCGT11T304R/L-F	.039	–	14°	20°
 Right hand insert shown.	**DCGT21.5V3R/LSS**	DCGT0702V3R/L-SS	.039	.138	14°	–
	DCGT**21.50.2R/LSS**	DCGT070201R/L-SS	.039	.138	14°	–
	DCGT**21.50.5R/LSS**	DCGT070202R/L-SS	.039	.138	14°	–
	DCGT**32.5V3RSS**	DCGT11T3V3R-SS	.039	.256	14°	–
	DCGT**32.50.2RSS**	DCGT11T301R-SS	.039	.256	14°	–
	DCGT**32.50.5RSS**	DCGT11T302R-SS	.039	.256	14°	–

POSITIVE INSERTS

Unit : inch

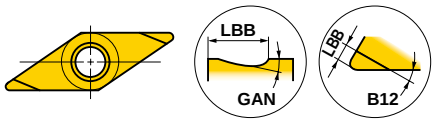
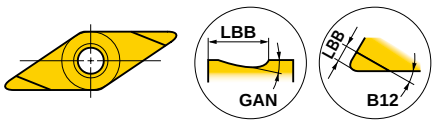
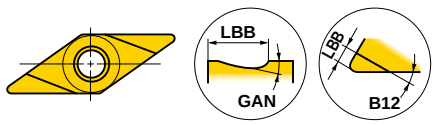
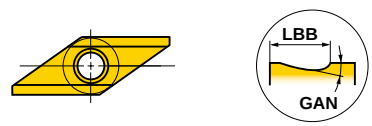
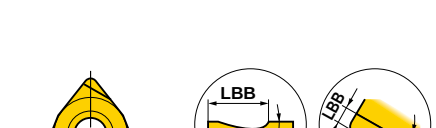
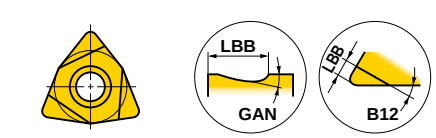
Geometry	Insert Number	(ISO) Number	LBB	LE	GAN	B12
 Right hand insert shown.	**DEGX430.5R/L**	DEGX150402R/L	.110	–	20°	–
	DEGX431R/L	DEGX150404R/L	.110	–	20°	–
	DEGX432R/L	DEGX150408R/L	.110	–	20°	–
 Left hand insert only.	**TCGT1.21V3LF**	TCGT0601V3L-F	.039	–	14°	20°
	TCGT1.210.2LF	TCGT060101L-F	.039	–	14°	20°
	TCGT1.210.5LF	TCGT060102L-F	.039	–	14°	20°
	TCGT1.211LF	TCGT060104L-F	.039	–	14°	20°
 Right hand insert shown.	**TEGX320.5R/L**	TEGX160302R/L	.079	.236	20°	–
	TEGX321R/L	TEGX160304R/L	.079	.236	20°	–
 Right hand insert shown.	**TPGH1.51.50.5R/LFS**	TPGH080202R/L-FS	.035	–	15°	20°
	TPGH1.51.51R/LFS	TPGH080204R/L-FS	.035	–	15°	20°
	TPGH1.81.50.5R/LFS	TPGH090202R/L-FS	.039	–	15°	20°
	TPGH1.81.51R/LFS	TPGH090204R/L-FS	.039	–	15°	20°
	TPGH220.5R/LFS	TPGH110302R/L-FS	.055	–	15°	20°
	TPGH221R/LFS	TPGH110304R/L-FS	.055	–	15°	20°
 Right hand insert shown.	**TPGX1.51.50.5R/L**	TPGX080202R/L	.051	–	10°	20°
	TPGX1.51.51R/L	TPGX080204R/L	.051	–	10°	20°
	TPGX1.81.50.5R/L	TPGX090202R/L	.063	–	10°	20°
	TPGX1.81.51R/L	TPGX090204R/L	.063	–	10°	20°
	TPGX1.81.52R/L	TPGX090208R/L	.055	–	10°	20°
	TPGX220.5L	TPGX110302L	.071	–	10°	20°
	TPGX221R/L	TPGX110304R/L	.071	–	10°	20°
	TPGX222R/L	TPGX110308R/L	.071	–	10°	20°
 Right hand insert shown.	**TPGV1.81.50.5LF**	TPGV090202L-F	.063	–	10°	20°
	TPGV1.81.51R/LF	TPGV090204R/L-F	.063	–	10°	20°
	TPGV220.5LF	TPGV110302L-F	.071	–	10°	20°
	TPGV221R/LF	TPGV110304R/L-F	.071	–	10°	20°
 Right hand insert shown.	**VCGT1.51.50.5R/LF**	VCGT080202R/L-F	.031	–	13°	20°
	VCGT1.51.51R/LF	VCGT080204R/L-F	.031	–	13°	20°

PRECISION BREAKER STANDARD

STANDARD FOR LEFT AND RIGHT HAND INSERTS

POSITIVE INSERTS

Unit : inch

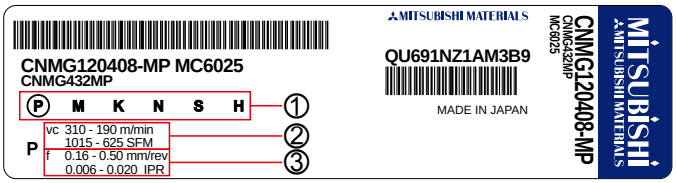
Geometry	Insert Number	(ISO) Number	LBB	LE	GAN	B12
 Right hand insert shown.	**VDGX320.5R/L**	VDGX160302R/L	.079	–	25°	20°
	VDGX321R/L	VDGX160304R/L	.079	–	25°	20°
 Right hand insert shown.	**VBGT220.5R/LF**	VBGT110302R/L-F	.039	–	13°	20°
	VBGT221R/LF	VBGT110304R/L-F	.039	–	13°	20°
	VBGT330.5R/LF	VBGT160402R/L-F	.059	–	13°	20°
	VBGT331R/LF	VBGT160404R/L-F	.059	–	13°	20°
 Right hand insert shown.	**VBET22V3R/LSR**	VBET1103V3R/L-SR	.098	–	30°	20°
	VBET220.2R/LSR	VBET110301R/L-SR	.098	–	30°	20°
	VBET220.5R/LSR	VBET110302R/L-SR	.098	–	30°	20°
	VBET221R/LSR	VBET110304R/L-SR	.098	–	30°	20°
 Right hand insert shown.	**VBET22V0R/LSN**	VBET110300R/L-SN	.039	–	20°	–
	VBET22V3R/LSN	VBET1103V3R/L-SN	.039	–	20°	–
	VBET220.2R/LSN	VBET110301R/L-SN	.039	–	20°	–
	VBET220.5R/LSN	VBET110302R/L-SN	.039	–	20°	–
	VBET221R/LSN	VBET110304R/L-SN	.039	–	20°	–
 Right hand insert shown.	**VBET22V3R/LWSN**	VBET1103V3R/LW-SN	.039	–	20°	–
 Left hand insert shown.	**WBGT1.21V3LF**	WBGT0201V3L-F	.039	–	13°	30°
	WBGT1.210.2LF	WBGT020101L-F	.039	–	13°	30°
	WBGT1.210.5LF	WBGT020102L-F	.039	–	13°	30°
	WBGT1.211LF	WBGT020104L-F	.039	–	13°	30°
	WBGT1.51.5V3LF	WBGTL302V3L-F	.039	–	13°	30°
	WBGT1.51.50.2LF	WBGTL30201L-F	.039	–	13°	30°
	WBGT1.51.50.5R/LF	WBGTL30202R/L-F	.039	–	13°	30°
	WBGT1.51.51R/LF	WBGTL30204R/L-F	.039	–	13°	30°
 Right hand insert shown.	**WCGT1.210.5R/L**	WCGT020102R/L	.039	–	15°	30°
	WCGT1.211R/L	WCGT020104R/L	.039	–	15°	30°
	WCGT1.51.50.5R	WCGTL30202R	.039	–	15°	30°
	WCGT1.51.51L	WCGTL30204L	.039	–	15°	30°

TOOL NAVI

OUTLINE

TOOL NAVI supports our customers with information and supplies suitable cutting conditions for each workpiece by selecting optimal indexable insert together with the optional tool.

LABEL INDICATION



∗1. The above is an example. There may be inserts recommended for multiple work materials.
∗2. Please contact us for recommended cutting conditions using coefficient values other than the above.

①Workpiece materials

P : Steel (Material reference : Carbon steel, alloy steel 180HB)
M : Stainless steel (Material reference : Austenitic stainless steel 180HB)
K : Cast iron (Material reference : Gray cast iron, ductile cast iron 180HB)
N : Aluminum alloy, Non-ferrous metal
S : Material reference : Titanium alloy 320HB, Ni, Co-based alloy 400HB
H : Hardened steel 60HRC

②Cutting speed standards

Work Material	Tool Life		Work Material	Hardness
	Life	Performance		
P	90min.	15min.	Carbon steel, alloy steel	180HB
M	90min.	15min.	Stainless steel	180HB
K	90min.	15min.	Cast iron	180HB
S	25min.	5min.	Titanium alloy	320HB
			Ni, Co-based alloy	400HB
H	80min.	10min.	Hardened steel	HRC60

③Feed rate

Minimum and maximum feed rate settings are based on the chip control range of the chip breaker.

∗3. N : Life based on each grade. For stable conditions choose the performance cutting speed and for unstable choose the tool life feed rate.
∗4. The tool life is based on the following (VB wear). Some materials include elements other than this.
PMKS • • • VB=0.3mm
H • • • VB=0.1mm

TOOL LIFE

Cutting speed has a large affect on tool life. TOOL NAVI is based on Taylor's equation (relationship vc x Tn=C between tool grade, cutting conditions, and tool life). Therefore, performance speed and tool life is found for each work material. When the customer requires different tool life, obtain coefficient values of the grade you use from the charts below. Multiply the coefficient values by the cutting speed to calculate the new cutting speed.

P Grade (Steel) cutting speed coefficient values.

Grade \ Tool life	15min	30min	45min	60min	90min
UE6105	1.00	0.79	0.69	0.63	0.55
MC6015	1.00	0.82	0.72	0.67	0.59
MC6025	1.00	0.83	0.75	0.69	0.62
UE6035	1.00	0.88	0.82	0.78	0.73
MP3025	1.00	0.85	0.77	0.72	0.65
NX2525	1.00	0.87	0.80	0.76	0.70

M Grade (Stainless Steel) cutting speed coefficient values.

Grade \ Tool life	15min	30min	45min	60min	90min
MC7015	1.00	0.83	0.75	0.70	0.63
MC7025	1.00	0.90	0.84	0.80	0.75
MP7035	1.00	0.84	0.76	0.71	0.62
US735	1.00	0.78	0.68	0.61	0.53

K Grade (Cast Iron) cutting speed coefficient values.

Grade \ Tool life	15min	30min	45min	60min	90min
MC5005	1.00	0.83	0.75	0.70	0.63
MC5015	1.00	0.83	0.75	0.69	0.62

(ex.) Medium cutting of steel
The 1st recommendation : MC6025
Indexable inserts : CNMG432MA
Recommended cutting speed : vc = 1017SFM
(Tool life : 15min.)

↓

Tool life required by the customer : 30min.
1017×0.83≒843SFM

HARDNESS OF WORKPIECE

Hardness of the workpiece also affects tool life. Mitsubishi's TOOL NAVI suggests cutting speed variations when hardness of the workpiece differs. Obtain the suitable coefficient value for each workpiece from the chart below. Multiply the coefficient value by the recommended cutting speed of the grade you use to calculate the new cutting speed.

Work Material	Soft ← (Hardness of workpiece) → Hard											
	120HB	140HB	160HB	180HB	200HB	220HB	240HB	260HB	280HB	300HB	320HB	340HB
P	1.34	1.19	1.08	1.00	0.92	0.85	0.80	0.75	0.71	0.68	0.64	0.61
M	1.41	1.23	1.10	1.00	0.91	0.85	0.78	0.72	0.68	0.64	0.61	0.58
K	1.27	1.19	1.09	1.00	0.97	0.91	0.88	0.85	0.81	0.78	0.75	0.72

CLASSIFICATION OF GRADES AND CHIP BREAKERS FOR TURNING

● Selection of optimum inserts for turning

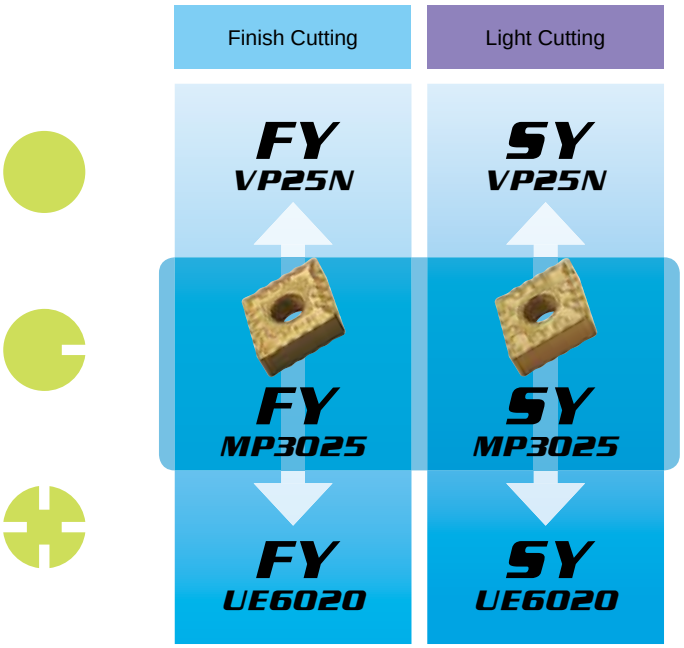
The following diagrams show for each work material, the optimal combination of suitable grades and chip breakers for each application area in turning.

CUTTING CONDITIONS

Stable Cutting	Continuous Cutting Constant Depth of Cut Pre-Machined Securely Clamped Component
General Cutting	
Unstable Cutting	Heavy Interrupted Cutting Irregular Depth of Cut Low Clamping Rigidity

CUTTING AREA

F	Finish Cutting
L	Light Cutting
M	Medium Cutting
R	Rough Cutting
H	Heavy Cutting



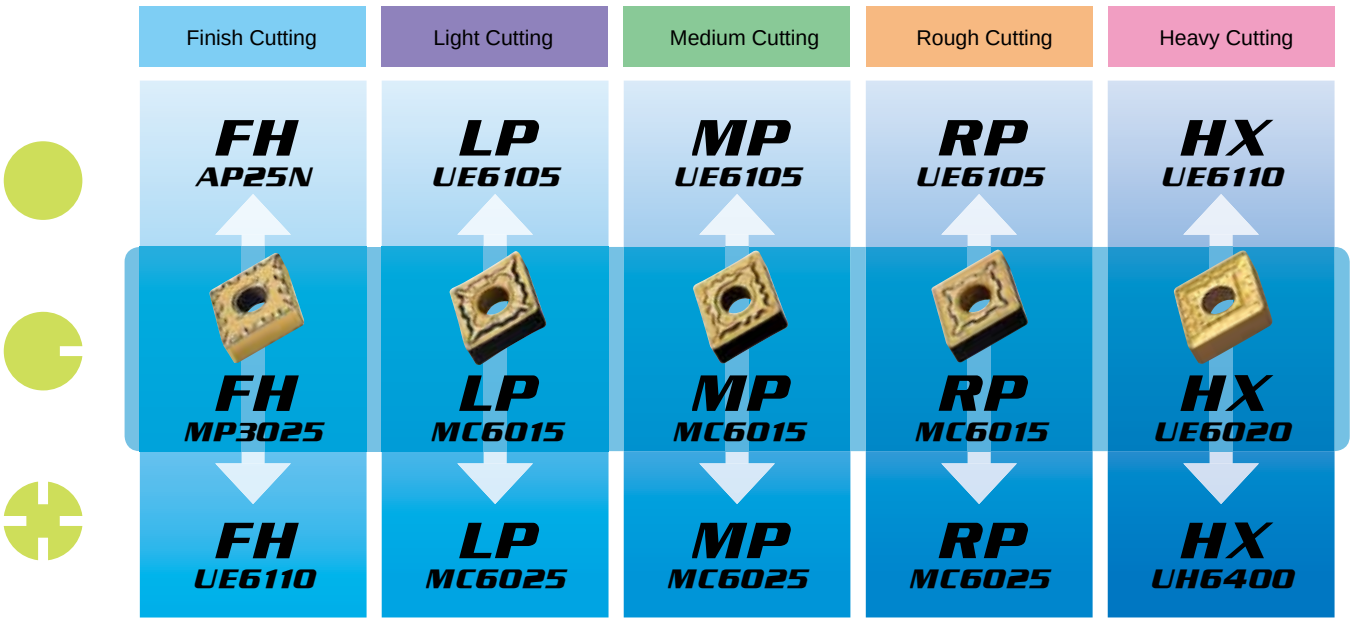
P Mild Steel (EX. : ASTM A283, AISI 1010)

NEGATIVE INSERTS

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	FY	VP25N	935—1460	.004—.010	.008—.032
	L	SY	VP25N	850—1330	.007—.013	.020—.048
General Cutting	F	FY	MP3025	900—1380	.004—.010	.008—.032
	L	SY	MP3025	820—1260	.007—.013	.020—.048
Unstable Cutting	F	FY	UE6020	935—1510	.004—.010	.008—.032
	L	SY	UE6020	850—1380	.007—.013	.020—.048

Stable Cutting	F Finish Cutting
General Cutting	L Light Cutting
Unstable Cutting	M Medium Cutting
	R Rough Cutting
	H Heavy Cutting



P Carbon Steel • Alloy Steel (EX. : AISI 1045, AISI 4140)

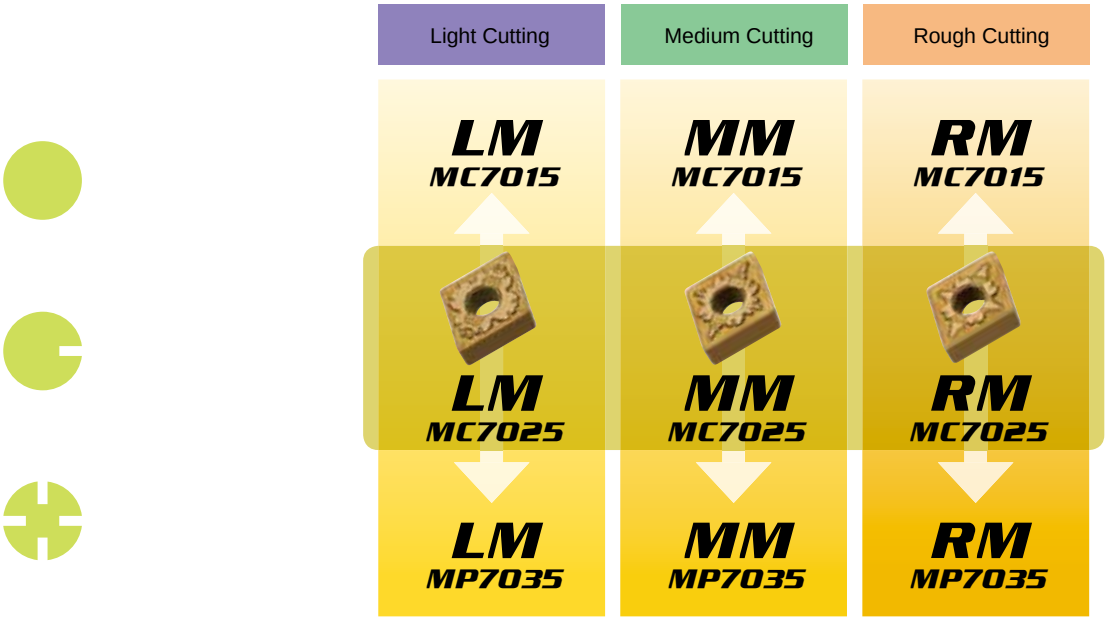
NEGATIVE INSERTS

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	FH	AP25N	705—1115	.004—.008	.008—.040
	L	LP	UE6105	720—1330	.004—.016	.012—.079
	M	MP	UE6105	655—1215	.007—.020	.012—.158
	R	RP	UE6105	620—1150	.010—.024	.060—.237
	H	HX	UE6110	525—900	.020—.050	.119—.434
General Cutting	F	FH	MP3025	690—1065	.004—.008	.008—.040
	L	LP	MC6015	690—1165	.004—.016	.012—.079
	M	MP	MC6015	620—1065	.007—.020	.012—.158
	R	RP	MC6015	590—1015	.010—.024	.060—.237
	H	HX	UE6020	510—820	.020—.050	.119—.434
Unstable Cutting	F	FH	UE6110	755—1280	.004—.008	.008—.040
	L	LP	MC6025	690—1115	.004—.016	.012—.079
	M	MP	MC6025	620—1015	.007—.020	.012—.158
	R	RP	MC6025	590—970	.010—.024	.060—.237
	H	HX	UH6400	440—640	.020—.050	.119—.434

CLASSIFICATION OF GRADES AND CHIP BREAKERS FOR TURNING

Stable Cutting	L Light Cutting
General Cutting	M Medium Cutting
Unstable Cutting	R Rough Cutting



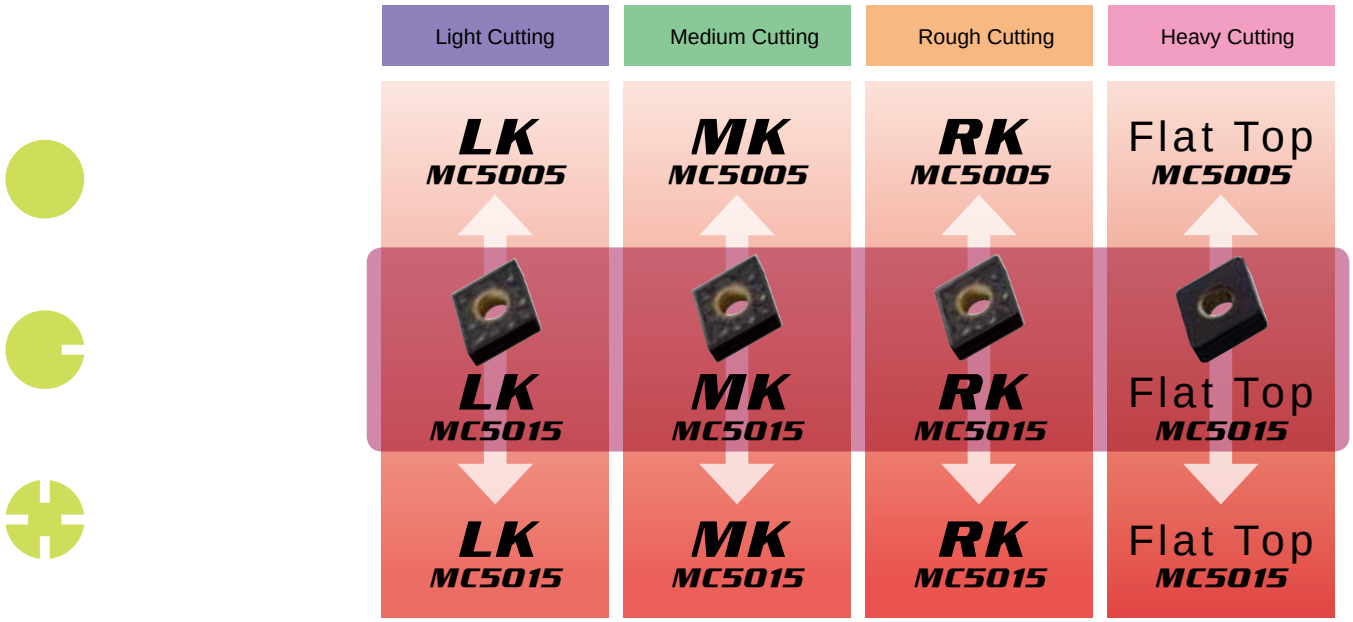
M Stainless Steel (EX. : AISI 304, AISI 306)

NEGATIVE INSERTS

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	L	LM	MC7015	590—935	.004—.012	.012—.079
	M	MM	MC7015	525—835	.006—.018	.028—.197
	R	RM	MC7015	510—805	.010—.022	.060—.237
General Cutting	L	LM	MC7025	525—705	.004—.012	.012—.079
	M	MM	MC7025	475—640	.006—.018	.028—.197
	R	RM	MC7025	460—605	.010—.022	.060—.237
Unstable Cutting	L	LM	MP7035	310—510	.004—.012	.012—.079
	M	MM	MP7035	280—460	.006—.018	.028—.197
	R	RM	MP7035	280—440	.010—.022	.060—.237

Stable Cutting	L Light Cutting
General Cutting	M Medium Cutting
Unstable Cutting	R Rough Cutting
	H Heavy Cutting



K Cast Iron • Ductile Cast Iron (EX. : AISI No 45 B)

NEGATIVE INSERTS

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	L	LK	MC5005	715—1100	.004—.016	.012—.079
	M	MK	MC5005	640—1000	.008—.022	.036—.158
	R	RK	MC5005	600—950	.010—.024	.060—.237
	H	Flat Top	MC5005	600—950	.008—.024	.099—.237
General Cutting	L	LK	MC5015	625—1000	.004—.016	.012—.079
	M	MK	MC5015	580—930	.008—.022	.036—.158
	R	RK	MC5015	540—860	.010—.024	.060—.237
	H	Flat Top	MC5015	540—860	.008—.024	.099—.237
Unstable Cutting	L	LK	MC5015	625—1000	.004—.016	.012—.079
	M	MK	MC5015	580—930	.008—.022	.036—.158
	R	RK	MC5015	540—860	.010—.024	.060—.237
	H	Flat Top	MC5015	540—860	.008—.024	.099—.237

CLASSIFICATION OF GRADES AND CHIP BREAKERS FOR TURNING

Stable Cutting	F Finish Cutting
General Cutting	L Light Cutting
Unstable Cutting	M Medium Cutting
	R Rough Cutting



S Titanium Alloy (EX. : Ti-6Al-4V)

NEGATIVE INSERTS

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	FJ	RT9010	150—310	.003—.008	.004—.040
	L	LS	MT9015	115—260	.004—.010	.008—.030
	M	MS	MT9015	130—260	.004—.010	.020—.158
	R	RS	MT9015	100—220	.008—.013	.036—.158
General Cutting	F	FJ	RT9010	150—310	.003—.008	.004—.040
	L	LS	MT9015	115—260	.004—.010	.008—.030
	M	MS	MT9015	130—260	.004—.010	.020—.158
	R	RS	MT9015	100—220	.008—.013	.036—.158
Unstable Cutting	F	FJ	RT9010	150—310	.003—.008	.004—.040
	L	MJ	RT9010	130—260	.003—.010	.016—.060
	M	MS	RT9010	130—260	.004—.010	.020—.158
	R	GJ	RT9010	115—245	.007—.014	.040—.119

Stable Cutting	F Finish Cutting
General Cutting	L Light Cutting
Unstable Cutting	M Medium Cutting
	R Rough Cutting



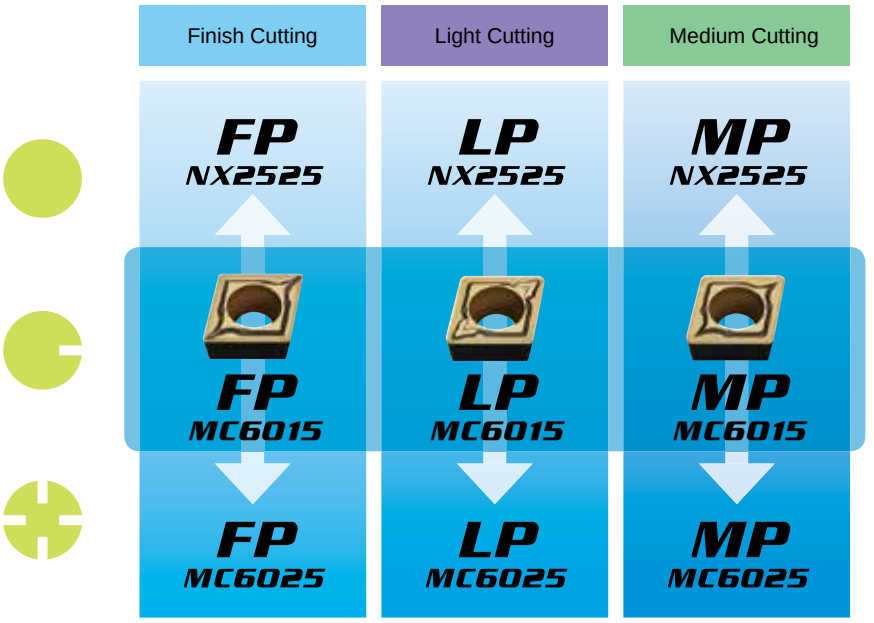
S Ni, Co-Based Alloy (EX. : Inconel®718)

NEGATIVE INSERTS

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	FJ	VP10RT	100—195	.003—.008	.004—.040
	L	LS	MP9005	90—330	.004—.010	.008—.030
	M	MS	MP9005	90—300	.004—.010	.020—.158
	R	RS	MP9015	60—220	.008—.013	.036—.158
General Cutting	F	FJ	VP10RT	100—195	.003—.008	.004—.040
	L	LS	MP9015	75—260	.004—.010	.008—.030
	M	MS	MP9015	75—245	.004—.010	.020—.158
	R	RS	MP9015	60—220	.008—.013	.036—.158
Unstable Cutting	F	FJ	VP15TF	65—130	.003—.008	.004—.040
	L	MJ	VP15TF	65—115	.003—.010	.016—.060
	M	MS	VP15TF	65—115	.004—.010	.020—.158
	R	GJ	VP15TF	50—100	.007—.014	.040—.119

CLASSIFICATION OF GRADES AND CHIP BREAKERS FOR TURNING



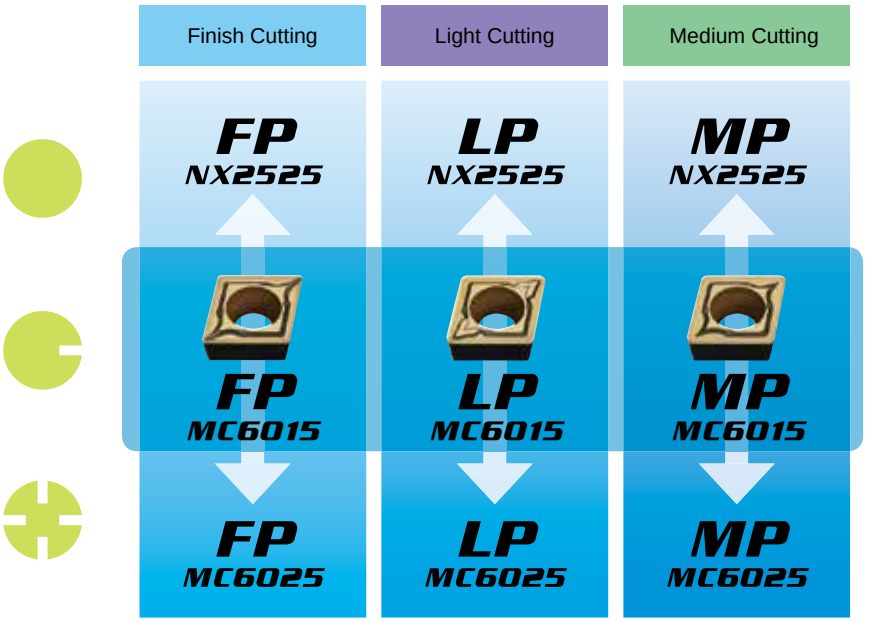
- Stable Cutting
- General Cutting
- Unstable Cutting
- F Finish Cutting
- L Light Cutting
- M Medium Cutting

P Mild Steel (EX. : ASTM A283, AISI 1010)

7° POSITIVE INSERTS WITH HOLE

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	FP	NX2525	740—1050	.002—.008	.008—.036
	L	LP	NX2525	740—1050	.003—.010	.008—.040
	M	MP	NX2525	605—870	.004—.012	.012—.079
General Cutting	F	FP	MC6015	820—1395	.002—.008	.008—.036
	L	LP	MC6015	820—1395	.003—.010	.008—.040
	M	MP	MC6015	670—1150	.004—.012	.012—.079
Unstable Cutting	F	FP	MC6025	820—1330	.002—.008	.008—.036
	L	LP	MC6025	820—1330	.003—.010	.008—.040
	M	MP	MC6025	670—1100	.004—.012	.012—.079



- Stable Cutting
- General Cutting
- Unstable Cutting
- F Finish Cutting
- L Light Cutting
- M Medium Cutting

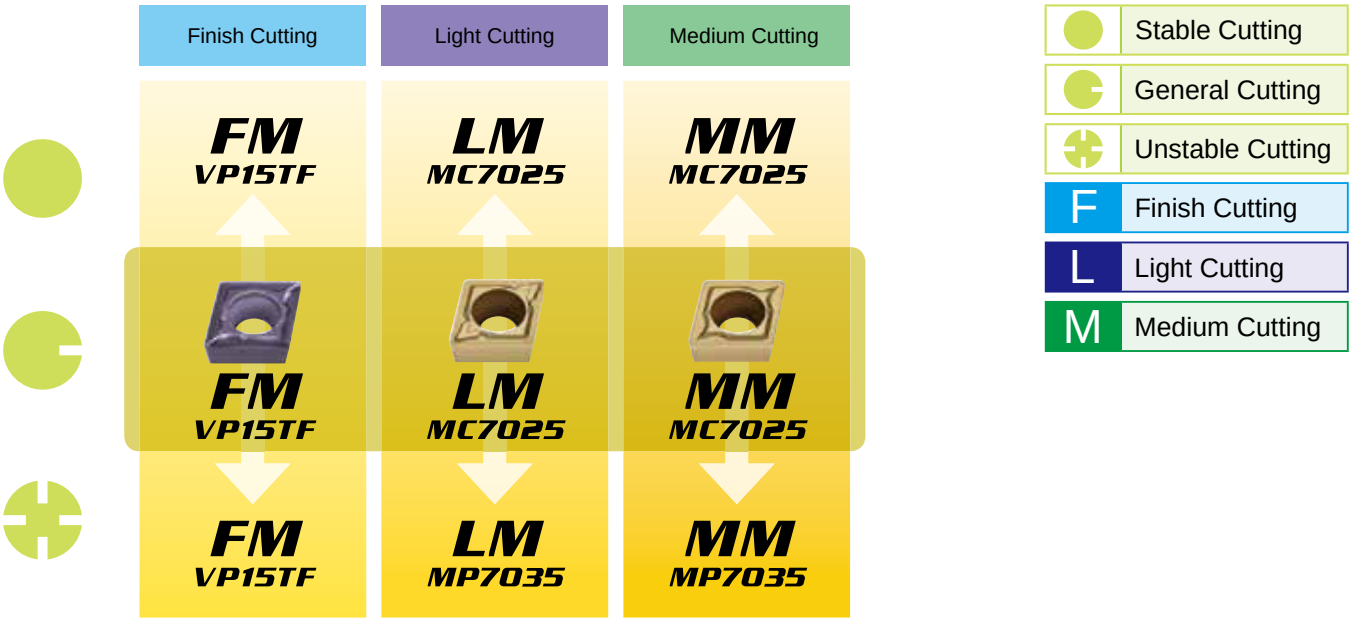
P Carbon Steel • Alloy Steel (EX. : AISI 1045, AISI 4140)

7° POSITIVE INSERTS WITH HOLE

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	FP	NX2525	540—770	.002—.008	.008—.036
	L	LP	NX2525	540—770	.003—.010	.008—.040
	M	MP	NX2525	440—640	.004—.012	.012—.079
General Cutting	F	FP	MC6015	605—1015	.002—.008	.008—.036
	L	LP	MC6015	605—1015	.003—.010	.008—.040
	M	MP	MC6015	490—850	.004—.012	.012—.079
Unstable Cutting	F	FP	MC6025	605—970	.002—.008	.008—.036
	L	LP	MC6025	605—970	.003—.010	.008—.040
	M	MP	MC6025	490—805	.004—.012	.012—.079

CLASSIFICATION OF GRADES AND CHIP BREAKERS FOR TURNING

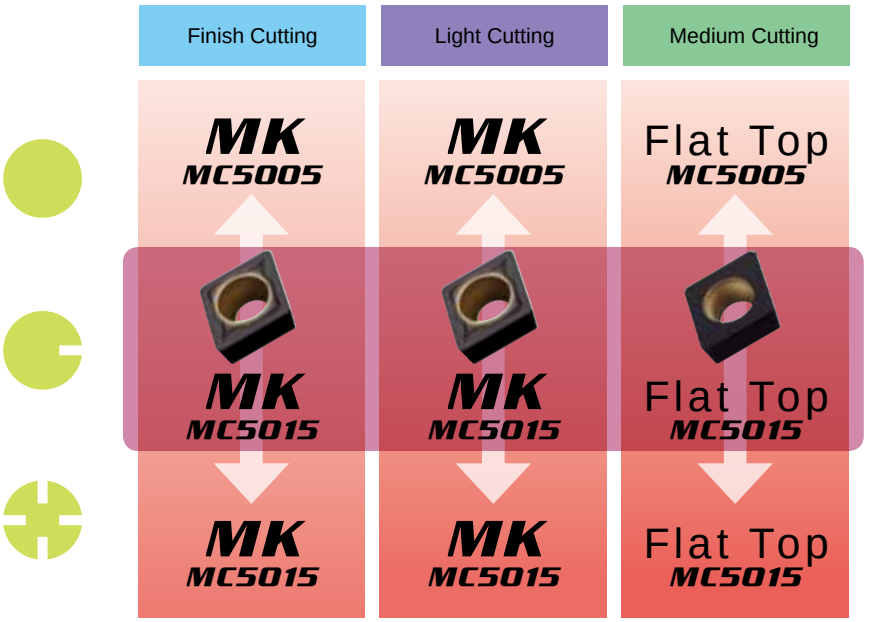


M Stainless Steel (EX. : AISI 304, AISI 306)

7° POSITIVE INSERTS WITH HOLE

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	FM	VP15TF	245—410	.002—.008	.008—.036
	L	LM	MC7025	460—620	.003—.010	.008—.040
	M	MM	MC7025	375—510	.004—.012	.012—.079
General Cutting	F	FM	VP15TF	245—410	.002—.008	.008—.036
	L	LM	MC7025	460—620	.003—.010	.008—.040
	M	MM	MC7025	375—510	.004—.012	.012—.079
Unstable Cutting	F	FM	VP15TF	245—410	.002—.008	.008—.036
	L	LM	MP7035	280—440	.003—.010	.008—.040
	M	MM	MP7035	230—375	.004—.012	.012—.079



Stable Cutting
General Cutting
Unstable Cutting
F Finish Cutting
L Light Cutting
M Medium Cutting

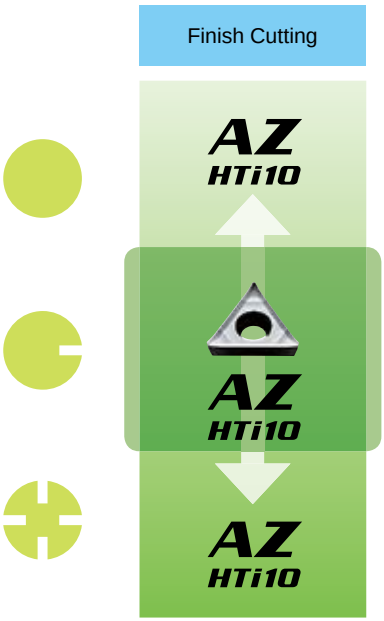
K Cast Iron • Ductile Cast Iron (EX. : AISI No 45 B)

7° POSITIVE INSERTS WITH HOLE

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	MK	MC5005	515—820	.004—.012	.012—.079
	L	MK	MC5005	515—820	.004—.012	.012—.079
	M	Flat Top	MC5005	515—820	.004—.012	.012—.079
General Cutting	F	MK	MC5015	470—745	.004—.012	.012—.079
	L	MK	MC5015	470—745	.004—.012	.012—.079
	M	Flat Top	MC5015	470—745	.004—.012	.012—.079
Unstable Cutting	F	MK	MC5015	470—745	.004—.012	.012—.079
	L	MK	MC5015	470—745	.004—.012	.012—.079
	M	Flat Top	MC5015	470—745	.004—.012	.012—.079

CLASSIFICATION OF GRADES AND CHIP BREAKERS FOR TURNING



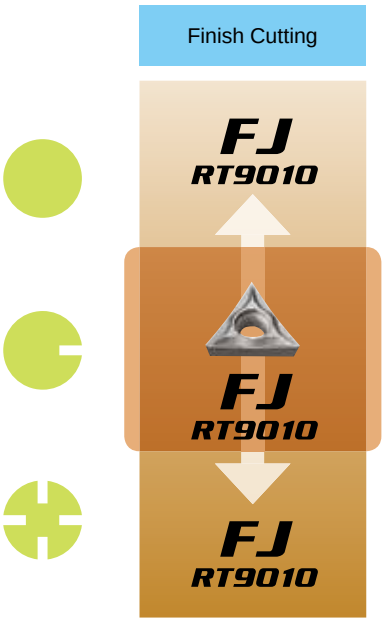
- Stable Cutting
- General Cutting
- Unstable Cutting
- F Finish Cutting

Aluminum Alloy (EX. : A6061, A7075)

7° POSITIVE INSERTS WITH HOLE

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	AZ	HTi10	985—2295	.004—.016	.008—.119
General Cutting	F	AZ	HTi10	985—2295	.004—.016	.008—.119
Unstable Cutting	F	AZ	HTi10	985—2295	.004—.016	.008—.119



●	Stable Cutting
◔	General Cutting
✚	Unstable Cutting
F	Finish Cutting

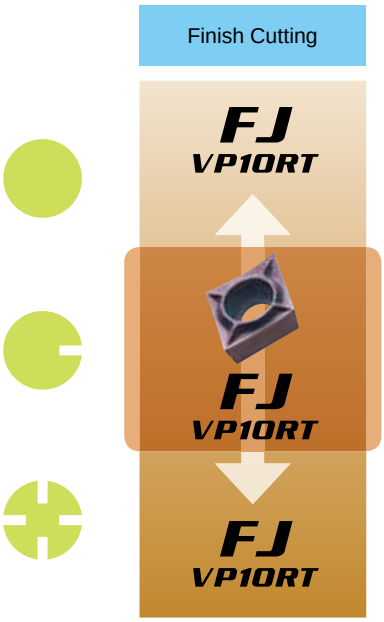
S Titanium Alloy (EX. : Ti-6Al-4V)

7° POSITIVE INSERTS WITH HOLE

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
● Stable Cutting	F	FJ	RT9010	115—245	.002—.005	.008—.056
◔ General Cutting	F	FJ	RT9010	115—245	.002—.005	.008—.056
✚ Unstable Cutting	F	FJ	RT9010	115—245	.002—.005	.008—.056

CLASSIFICATION OF GRADES AND CHIP BREAKERS FOR TURNING



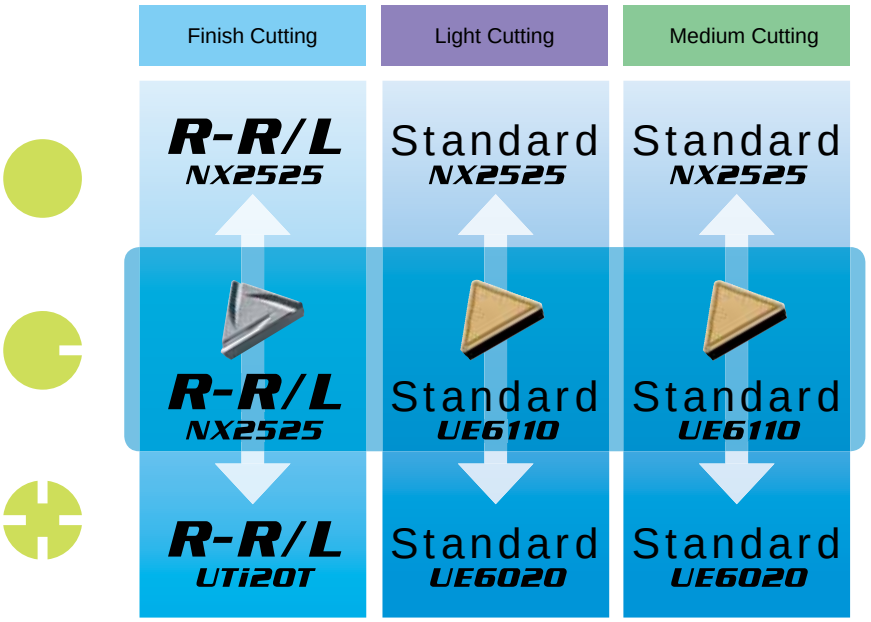
- Stable Cutting
- General Cutting
- Unstable Cutting
- F Finish Cutting

S Ni, Co-Based Alloy (EX. : Inconel®718)

7° POSITIVE INSERTS WITH HOLE

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	FJ	VP10RT	65—150	.002—.005	.008—.056
General Cutting	F	FJ	VP10RT	65—150	.002—.005	.008—.056
Unstable Cutting	F	FJ	VP10RT	65—150	.002—.005	.008—.056



- Stable Cutting
- General Cutting
- Unstable Cutting
- F Finish Cutting
- L Light Cutting
- M Medium Cutting

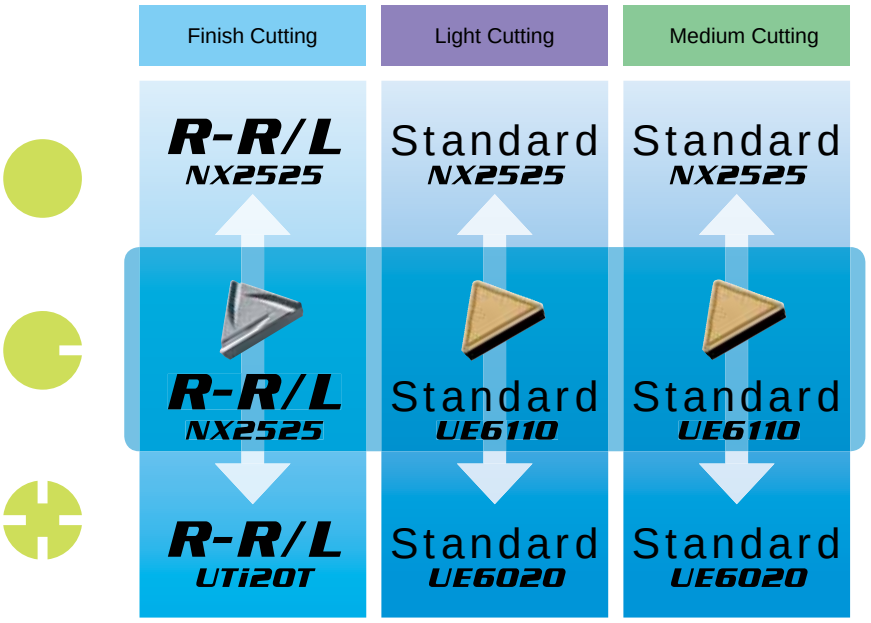
P Mild Steel (EX. : AISI ASTM A283, AISI 1010)

11° POSITIVE INSERTS WITHOUT HOLE

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	R-R/L	NX2525	740—1050	.002—.005	.008—.024
	L	Standard	NX2525	605—870	.004—.012	.012—.079
	M	Standard	NX2525	605—870	.004—.012	.012—.079
General Cutting	F	R-R/L	NX2525	740—1050	.002—.005	.008—.024
	L	Standard	UE6110	670—1150	.004—.012	.012—.079
	M	Standard	UE6110	670—1150	.004—.012	.012—.079
Unstable Cutting	F	R-R/L	UTi20T	375—540	.002—.005	.008—.024
	L	Standard	UE6020	640—1050	.004—.012	.012—.079
	M	Standard	UE6020	640—1050	.004—.012	.012—.079

CLASSIFICATION OF GRADES AND CHIP BREAKERS FOR TURNING



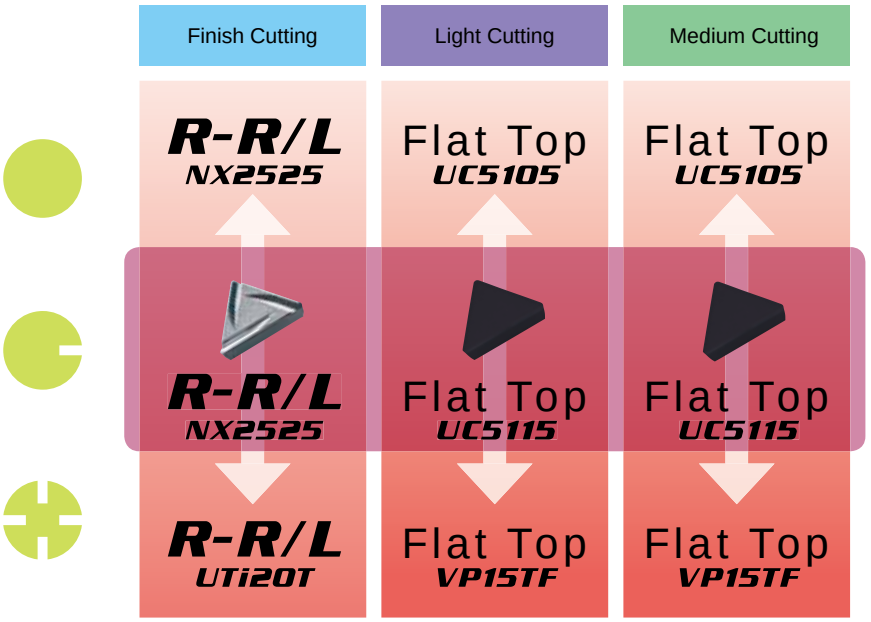
- Stable Cutting
- General Cutting
- Unstable Cutting
- F Finish Cutting
- L Light Cutting
- M Medium Cutting

P Carbon Steel • Alloy Steel (EX. : AISI 1045, AISI 4140)

11° POSITIVE INSERTS WITHOUT HOLE

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	R-R/L	NX2525	540—770	.002—.005	.008—.024
	L	Standard	NX2525	440—640	.004—.012	.012—.079
	M	Standard	NX2525	440—640	.004—.012	.012—.079
General Cutting	F	R-R/L	NX2525	540—770	.002—.005	.008—.024
	L	Standard	UE6110	490—850	.004—.012	.012—.079
	M	Standard	UE6110	490—850	.004—.012	.012—.079
Unstable Cutting	F	R-R/L	UTi20T	280—395	.002—.005	.008—.024
	L	Standard	UE6020	475—770	.004—.012	.012—.079
	M	Standard	UE6020	475—770	.004—.012	.012—.079



- Stable Cutting
- General Cutting
- Unstable Cutting
- F Finish Cutting
- L Light Cutting
- M Medium Cutting

K Cast Iron • Ductile Cast Iron (EX. : AISI No 45 B)

11° POSITIVE INSERTS WITHOUT HOLE

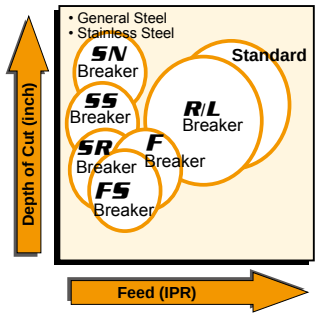
vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	R-R/L	NX2525	490—670	.002—.005	.008—.024
	L	Flat Top	UC5105	440—820	.004—.012	.012—.079
	M	Flat Top	UC5105	440—820	.004—.012	.012—.079
General Cutting	F	R-R/L	NX2525	490—670	.002—.005	.008—.024
	L	Flat Top	UC5105	425—805	.004—.012	.012—.079
	M	Flat Top	UC5105	425—805	.004—.012	.012—.079
Unstable Cutting	F	R-R/L	UTi20T	260—375	.002—.005	.008—.024
	L	Flat Top	VP15TF	375—525	.004—.012	.012—.079
	M	Flat Top	VP15TF	375—525	.004—.012	.012—.079

BREAKER SYSTEMS FOR SMALL SIZE INSERTS

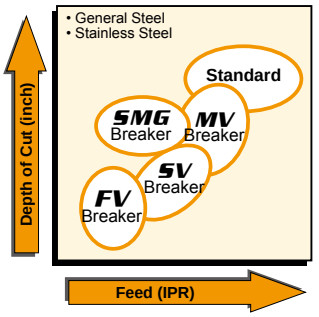
ANGULAR AND PARALLEL CHIP BREAKER

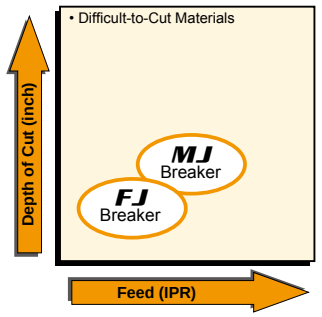
CHIP CONTROL RANGES



3-DIMENSIONAL CHIP BREAKER

CHIP CONTROL RANGES

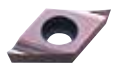
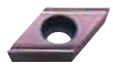




FEATURES OF CHIP BREAKER

Breaker	Features	CCGH/CCGT Type	CCMH/CCMT CPMH/CPMT Type	DCMT Type	DCGT Type	TCGT/TCMT Type	TPMH Type	VBGT/VBMT Type	VCMT Type	WBMT/WCGT Type
SMG (G class)	● For medium cutting. ● 3D molded chipbreaker provides good chip control.Breaker geometry appropriate for copying and back turning.		—	—		—	—	—	—	—
FV (M class)	● Sharp cutting edge and low resistance design dots achieve excellent cutting performance. ● Suitable for low depth of cut and low feed rates.	—			—					—
SV (M class)	● For light cutting. ● The double design dots promote chip discharge for mild steel machining and at low depth of cut machining.	—			—	—				—
MV (M class)	● A positive insert and the large rake angle achieve sharp cutting edge performance. ● The double breakers and round-shaped dots in the rake face achieve a wide range of chip discharge.	—			—	—				
Standard (M class)	● For medium cutting. ● Balance of edge strength and sharpness due to a combination of a flat land and large rake angle.	—			—		—			—
FJ	● The curved cutting edges support changes in cutting depth-smooth chip discharge and disposal. ● The large rake angle highly suitable for finishing difficult-to-cut materials.		—	—			—	—	—	
MJ	● The curved cutting edges support changes in cutting depth-smooth chip discharge and disposal. ● Large rake angle highly suitable for finish-light cutting difficult-to-cut materials.		—	—			—	—	—	

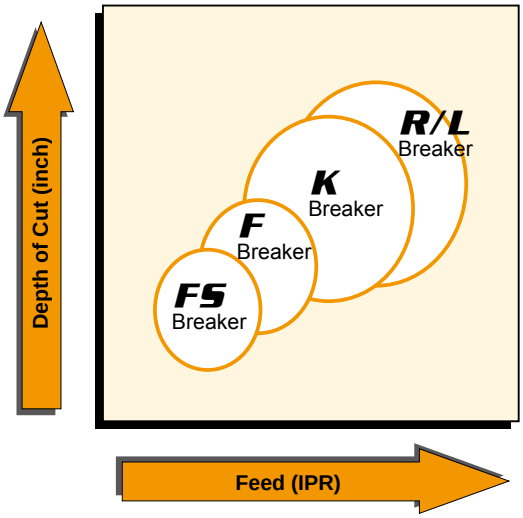
Breaker	Features	CCGH/CCGT Type	CPGT Type	DCGT Type	TPGH Type	TPGV/TPGT Type	TCGT Type	VBGT/VCGT Type	WBGT Type	WCGT Type	WPGT Type
FS	● For precision finishing. ● Narrow angled breaker provides optimal chip control. ● Sharp cutting edge generates excellent surface finish.	—	—	—		—	—	—	—	—	
F	● For finish cutting. ● Angled breaker controls chip flow. ● Sharp cutting edge generates excellent surface finish.				—					—	—
R/L	● Angled breaker for light cutting. ● Good chip control at low to medium feed rates.	—	—	—	—	—	—	—	—		—
Standard	● For light cutting. ● Good chip control at low to medium feed rates.	—		—	—	—	—	—	—	—	

Breaker	Features	CCET Type	CCGT Type	DCET Type	DCGT Type	VBET Type
SR	● The wide angled breaker for medium cutting is suitable for Swiss type lathe machining. ● The insert design for low resistance controls chip flow.		—		—	
SS	● The parallel breaker for light cutting is suitable for Swiss type lathe machining. ● Excellent chip control at low feed rate.	—		—		—
SN	● The parallel breaker for general purpose is suitable for Swiss type lathe machining. ● Excellent chip control for low to medium feed rates.					

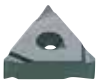
PRECISION BREAKER SYSTEM (NEGATIVE INSERTS)

ANGULAR AND PARALLEL CHIP BREAKERS (NEGATIVE INSERTS)

CHIP CONTROL RANGES



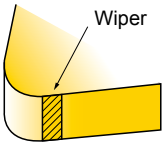
FEATURES OF CHIP BREAKER

Breaker	Features	DNGG Type	SNGG Type	TNGG Type	VNGG Type
FS	● For precision finishing. ● Narrow width angled breaker for good chip control. ● Sharp cutting edge produces excellent surface finish.	—	—		—
F	● Finish cutting. ● Angled breaker controls chip flow. ● Sharp cutting edge produces excellent surface finish.	—	—		—
K	● Parallel breaker for light cutting. ● Excellent chip control at low to medium feed rates.	—	—		—
R/L	● Parallel breaker for medium cutting. ● Good chip control at medium feed rates				

WIPER INSERT

What is a Wiper Insert?

- The wiper insert is designed with a short, flat edge that is located where the straight edge meets the corner radius.
- In comparison to conventional breakers, the surface finish is maintained even if the feed rate is doubled.
- Machining at high feed rates improves cutting efficiency.



• Right hand wiper shown.

●Improving Surface Finish Roughness
Under the same machining conditions against conventional breakers, but with the feed rate increased, the surface finish of the workpiece can be maintained.

●Improving Efficiency
High feed rates not only shorten machining times but employing a wiper also makes it possible to combine roughing and finishing operations.

●Increased Tool life
When wiper inserts are employed, the high feed rate possible reduces the time in cut therefore, delaying the progression of wear and increasing insert tool life.

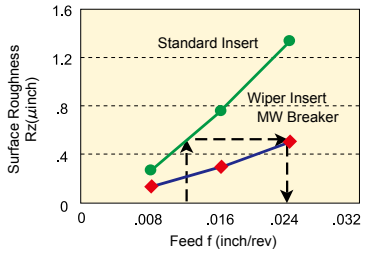
●Improving Chip Control
Under high feed conditions, the chips generated become thicker and are more easily broken, thus, chip control is improved.

Wiper insert with **High feed (The feed rate is doubled.)**

Finished surface: Same surface roughness

Standard insert with **The conventional feed condition**

*Wiper inserts allow high feed rates.



<Cutting Condition>
Workpiece : AISI1045
Insert : CNMG432◌◌
Cutting Speed=655SFM
Depth of Cut=.059inch
Feed rate=.008—.024inch/rev
with flood coolant

The surface roughness does not deteriorate even when the feed rate is doubled (.012→.024) !

■Wiper insert + machining at high feed rates
- Reduced machining time
- Increased production rate
- Improved chip control

■Wiper insert + machining at conventional feed rates
- Eliminating the finishing step
  (Combine roughing and finishing into single pass.)

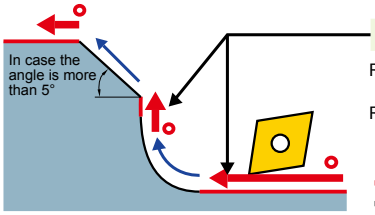
- Reducing cost
- Increased productivity
- Reduced machine down time

<Real cost reduction!!>

The Estimation of finished surface roughness when using a wiper insert

Wipers are effective when external machining, boring and facing.

*The surface roughness when machining at corner R or taper angle over 5°, is same quality as machining with the standard inserts.



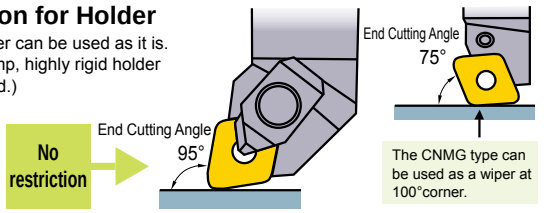
Rz(W)=Rz×0.5

Rz(W)= Finished surface roughness when using a wiper insert.
Rz: Finished surface roughness in conventional conditions. (When using a standard insert)

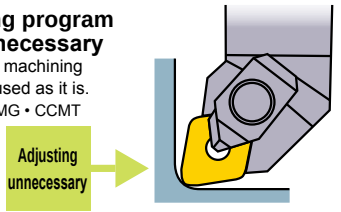
Effective uses of a wiper insert
Non effective uses of a wiper insert

Special attention is not necessary when using CNMG • WNMG • CCMT types

No Restriction for Holder
The standard holder can be used as it is.
(*The double clamp, highly rigid holder is recommended.)



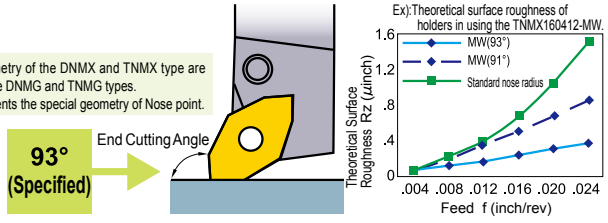
No machining program adjustment necessary
The conventional machining program can be used as it is.
(The CNMG • WNMG • CCMT types are based on ISO/ANSI standards.)



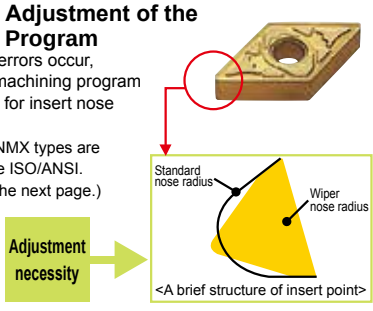
Special attention is necessary when using DNMX • TNMX types due to the special top face geometry

Restriction for Holder
Use a holder with an end cutting angle of 93°to improve wiper efficiency. A holder with a cutting edge angle of 91°can marginally improve wiper efficiency (see the figure below), however, there is no wiper efficiency with other end cutting angles (60°, 90°, 107°etc.).

The hole geometry of the DNMX and TNMX type are the same as the DNMG and TNMG types.
The "X" represents the special geometry of Nose point.



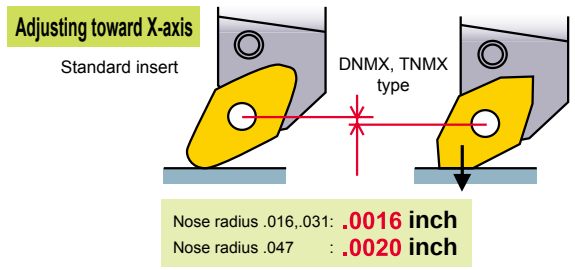
Necessary Adjustment of the Machining Program
If dimensional errors occur, please adjust machining program to compensate for insert nose configuration.
(The DNMX • TNMX types are not based on the ISO/ANSI. Please refer to the next page.)

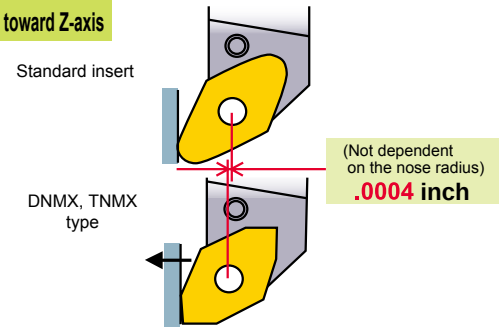


MACHINING PROGRAM ADJUSTMENTS FOR DNMX AND TNMX INSERTS

A) Turning and facing

Adjusting the differential between a standard insert and Z-axis / X-axis.

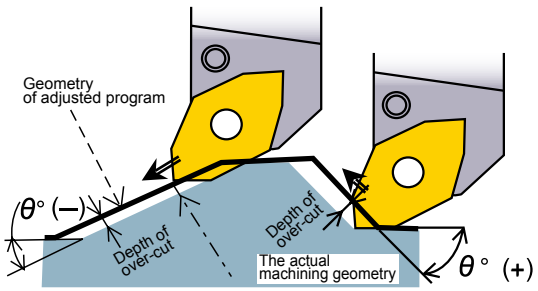




B) Machining a form or taper

Required to machine an accurate form or taper.
Move the tool perpendicular to the machined surface.

(Note) Adjust the drive-in angle toward the normal line when the part where the adjust number in minus (θ=60°−70°) is not machined completely.



Classification

Nose Radius	Taper Angle θ°															
	-25−-15	-10	-5	**0**	5	10	15	20−35	40	45	50	55	60−65	70	75−85	**90**
.047	.0016	.0012	.0004	**0**	.0008	.0012	.0016	.0020	.0016	.0016	.0008	.0004	-.0004	0	.0004	**0**
.031	.0012	.0008	.0004	**0**	.0004	.0008	.0012	.0016	.0012	.0012	.0008	0	-.0004	0	.0004	**0**
.016	.0008	.0004	.0004	**0**	.0004	.0004	.0008	.0008	.0008	.0004	.0004	0	-.0004	-.0004	0	**0**

Values→+numbers:adjustment of relief angle, -numbers:adjustment of plunge in angle (inch)

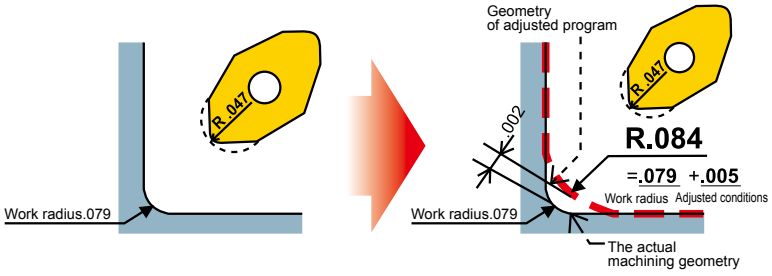
C) Compensation when machining a corner radius

1) Tool path adjustment method

Machine the correct form by altering the tool path corner radius.
Programmed corner radius = Part print (P/P) corner radius + compensation factor.

Nose radius	Programmed corner radius
.016	P/P **+ .0020"**
.031	P/P **+ .0043"**
.047	P/P **+ .0055"**

Ex): In the case of machining a corner with a radius R .079 when using an insert with a nose radius R .047.

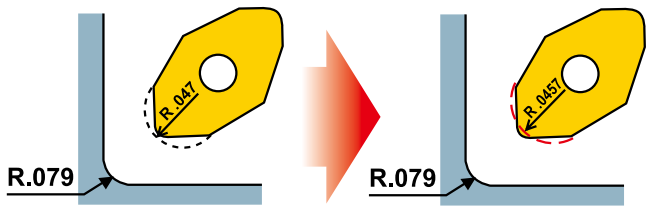


2) Nose radius adjustment method

Machine the correct form by altering the insert nose radius value in the machine program.
It is not necessary to alter the tool path when using this method however, a dimensional error of up to +/− .0012" may occur.

Nose radius	Adjusted nose radius value
.016"	**.0142"**
.031"	**.0229"**
.047"	**.0457"**

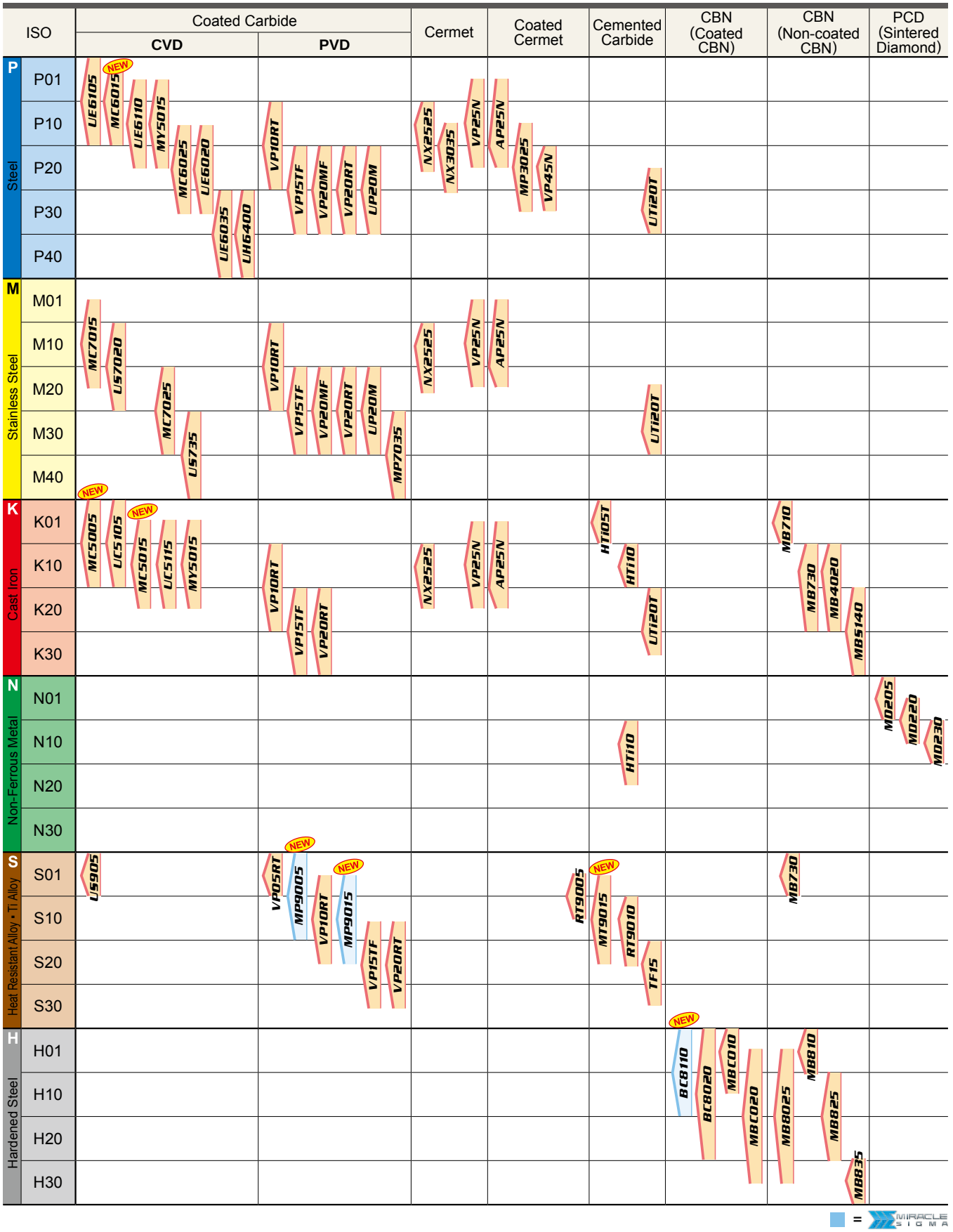
Ex): In the case of machining a corner with a radius R .079 when using an insert with a nose radius R .047.



(Note) The correction value is the same for both DNMX and TNMX inserts. Discriminate between them only by the different nose radius.

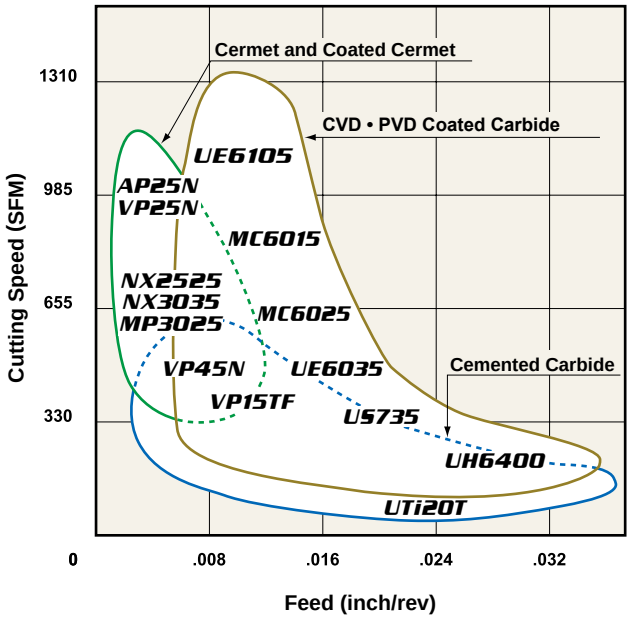
GRADES FOR TURNING

● INDEXABLE INSERT GRADES FOR TURNING

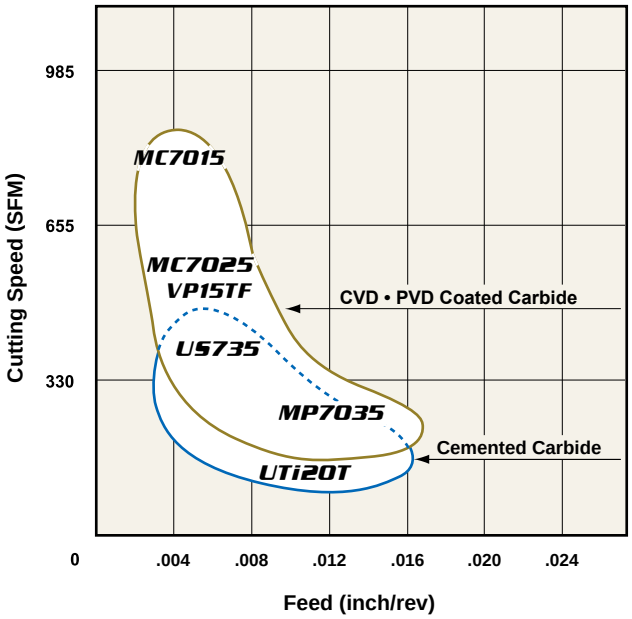


TURNING APPLICATION RANGE

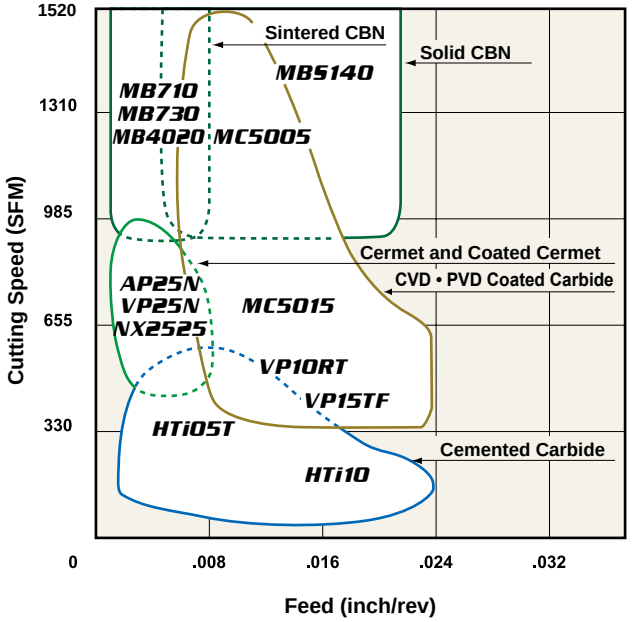
P STEEL



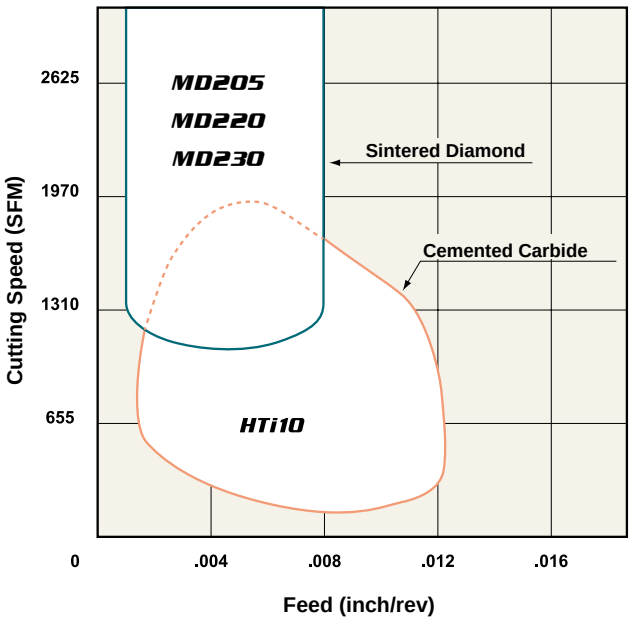
M STAINLESS STEEL



K CAST IRON



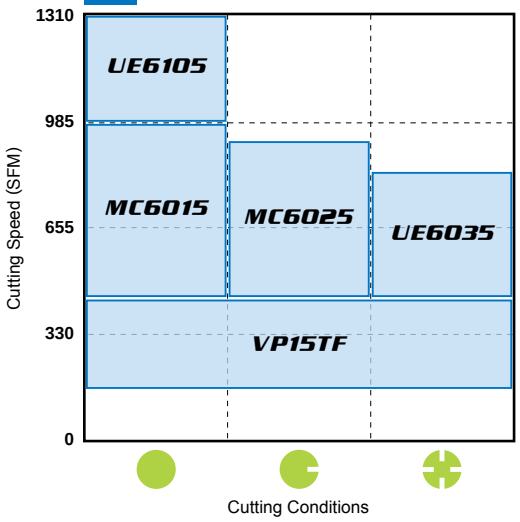
N NON-FERROUS METAL



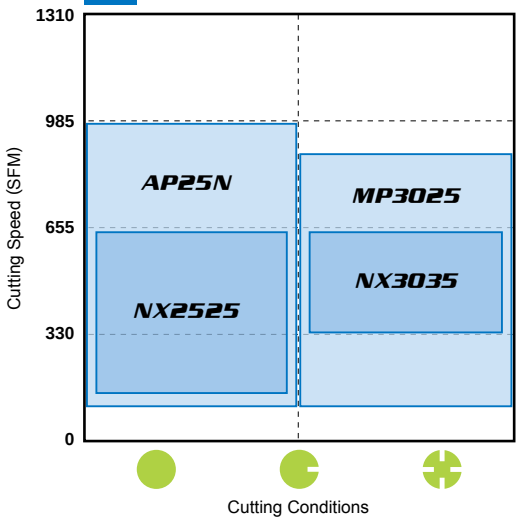
TURNING APPLICATION RANGE

●Recommendation of the insert grade based on cutting speed and conditions for each work piece.

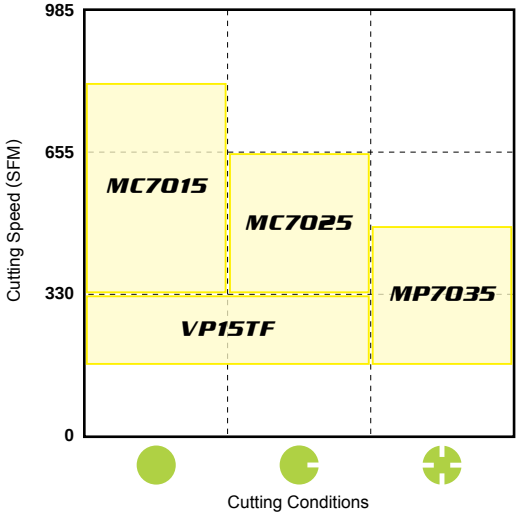
P STEEL (Medium-Rough Cutting)



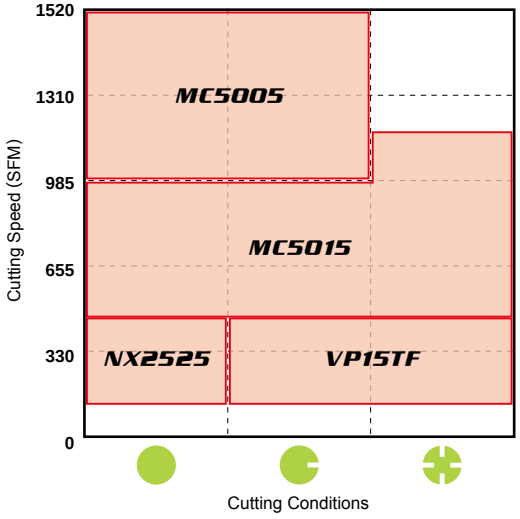
P STEEL (Finish Cutting)



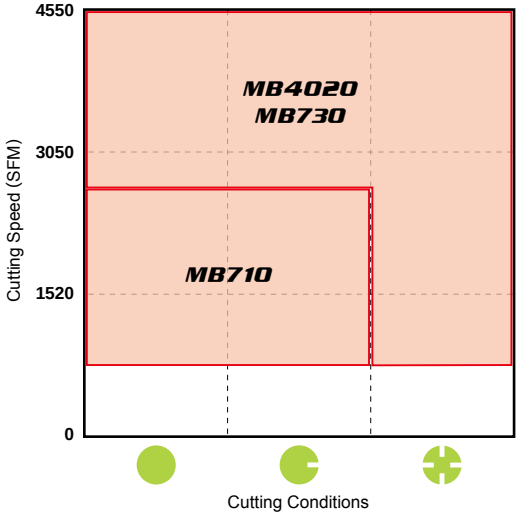
M STAINLESS STEEL



K CAST IRON



K CAST IRON (CBN)



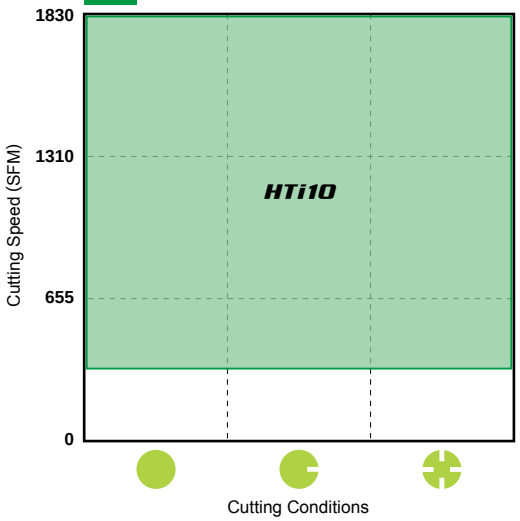
CUTTING CONDITIONS

Stable Cutting — Continuous Cutting, Constant Depth of Cut, Pre-Machined, Securely Clamped Component

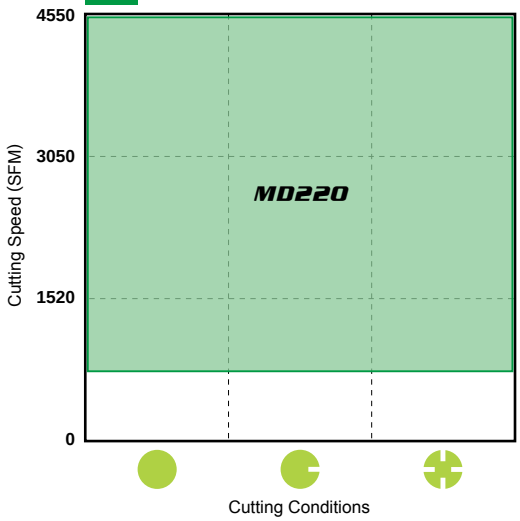
Unstable Cutting — Heavy Interrupted Cutting, Irregular Depth of Cut, Low Clamping Rigidity

General Cutting

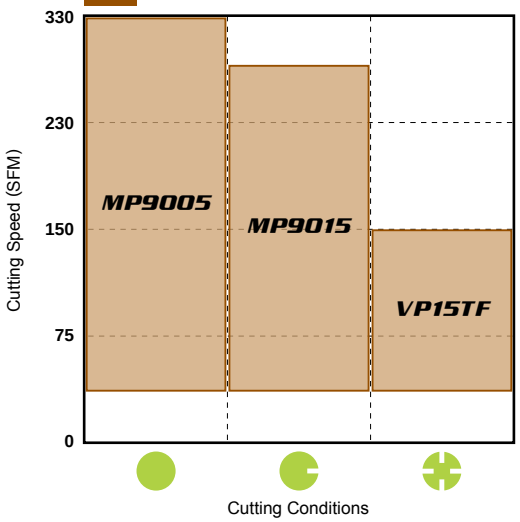
N NON-FERROUS METAL



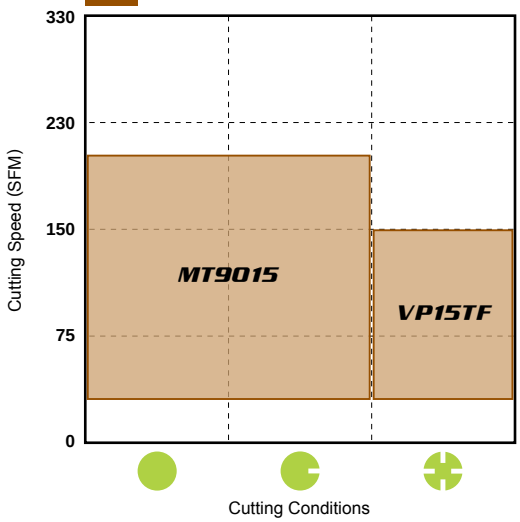
N NON-FERROUS METAL (PCD)



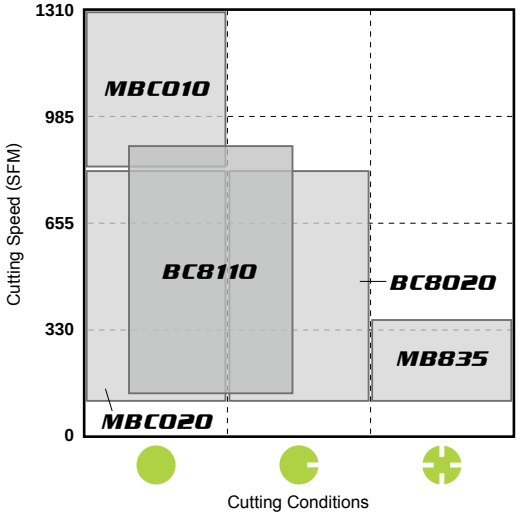
S HEAT RESISTANT ALLOY



S TITANIUM ALLOY



H HARDENED MATERIALS (CBN)



COATED CARBIDE (CVD)

- Special tough fibrous structure improves wear and fracture resistance.
- Cover a wide application range and thus reduces the number of tools required.

SELECTION STANDARD

TURNING

	Work Material	Cutting Mode	Recommended Grade	Recommended Cutting Speed (SFM)	ISO	Application Range
P	Steel	Continuous Cutting	**UE6105**	1150 (655 – 1800)	P01	UE6105, NEW MC6015, UE6110, MY5015, MC6025, UE6020, UE6035, UH6400
			MC6015	820 (495 – 1315)	P10	
			MC6025	655 (330 – 920)	P20	
		Interrupted Cutting			P30	
			UE6035	490 (260 – 655)	P40	
M	Stainless Steel	Continuous Cutting	**MC7015**	655 (525 – 820)	M01	MC7015, US7020, MC7025, US735
			MC7025	490 (390 – 655)	M10	
		Continuous and Interrupted Cutting			M20	
			US735	330 (260 – 390)	M30	
					M40	
K	Cast Iron Ductile Cast Iron	Continuous Cutting	**MC5005**	985 (655 – 1315)	K01	NEW MC5005, UC5105, NEW MC5015, UC5115, MY5015
					K10	
		Interrupted Cutting	**MC5015**	820 (490 – 985)	K20	
					K30	
S	Heat Resistant Alloys	Continuous and Interrupted	**US905**	260 (165 – 330)	S01	US905

High reliability for a wide range of steel machining.

NEW

MC6015

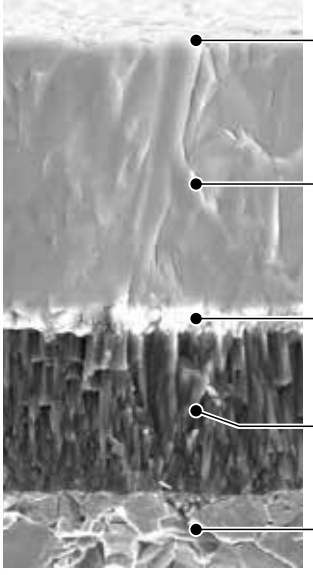
Nano-Texture Technology

The optimized crystal growth, Nano-Texture coating technology provides outstanding wear and chipping resistance.

TOUGH-Grip Technology

The interface between the layers is controlled at the nano level, allowing the TOUGH GRIP layer extremely high levels of adhesion to prevent delamination.





Smooth coating surface

Prevents abnormal damage, welding and chipping

Ultra thick layer Nano-texture Al_2O_3

Delivers outstanding wear resistance even at high temperature

TOUGH-Grip

Prevents delamination of a coating

Nano-texture TiCN

Provides superior wear resistance and chipping resistance

Special carbide substrate

Prevents crack development
Stable tool life

GRADE CHARACTERISTICS

Grade	Substrate			Coating Layer	
	Hardness (HRA)	T.R.S (GPa)	Surface	Composition	Thickness
UC5105	92.2	2.0	–	TiCN-Al_2O_3	Thick
NEW MC5005	91.0	2.2	–	TiCN-Al_2O_3	Thick
UC5115	91.0	2.2	–	TiCN-Al_2O_3	Thick
NEW MC5015	91.0	2.2	–	TiCN-Al_2O_3	Thick
UE6105	90.8	1.8	Tough	TiCN-Al_2O_3-Ti Compound	Thick
UE6110	90.3	2.0	Tough	TiCN-Al_2O_3-Ti Compound	Thick
UE6020	90.0	2.2	Tough	TiCN-Al_2O_3-Ti Compound	Thick
NEW MC6015	90.2	2.2	Tough	TiCN-Al_2O_3-Ti Compound	Thick
MC6025	90.2	2.2	Tough	TiCN-Al_2O_3-Ti Compound	Thick
UE6035	89.5	2.3	Tough	TiCN-Al_2O_3-TiN	Thick
UH6400	89.5	2.3	Tough	TiCN-Al_2O_3-Ti Compound	Thick
MC7015	90.7	2.0	Tough	TiCN-Al_2O_3-TiN	Thin
US7020	90.5	2.0	Tough	TiCN-Al_2O_3-TiN	Thin
MC7025	89.4	2.4	–	TiCN-Al_2O_3-TiN	Thin
US735	89.0	2.6	–	Ti Compound	Thin
US905	92.2	2.0	–	TiCN-Al_2O_3	Thin
MY5015	91.2	2.4	–	TiCN-Al_2O_3-TiN	Thin

★1GPa=102kg/mm^2

ISO Insert Series for Cast Iron Turning

NEW

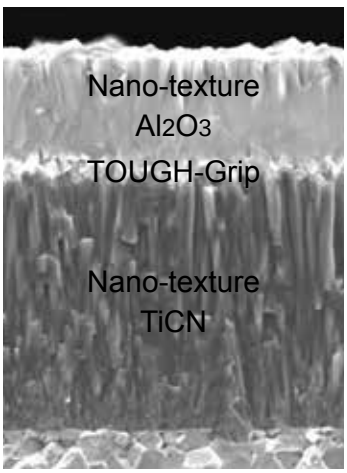
MC5005/MC5015

The high strength CVD nano-coated layer is formed by the synergistic effects between “Nano-texture coating technology” and “TOUGH-GRIP Technology”, thereby achieving superior wear resistance when turning cast iron.





MC5005



MC5015

COATED CARBIDE (PVD)

- PVD coating prolongs tool life.
- Coating of tools with sharp edges is possible without softening or changing the quality of the substrate.

SELECTION STANDARD

TURNING

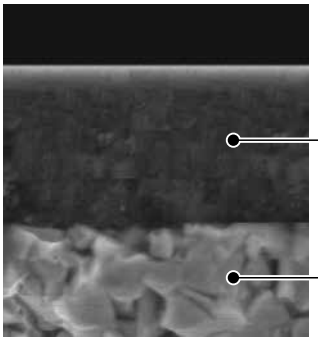
Work Material	Recommended Grade	Recommended Cutting Speed (SFM)	ISO	Application Range
P Steel	VP10RT	390 (330 – 490)	P01	
	VP15TF	390 (330 – 490)	P10	VP10RT
	VP20MF	390 (330 – 490)	P20	VP15TF, VP20MF, VP20RT, UP20M
	VP20RT	390 (330 – 490)	P30	
	UP20M	390 (330 – 490)	P40	
M Stainless Steel	VP10RT	390 (330 – 490)	M01	
	VP15TF	390 (330 – 490)	M10	VP10RT
	VP20MF	390 (330 – 490)	M20	VP15TF, VP20MF, VP20RT, UP20M
	VP20RT	390 (330 – 490)	M30	
	UP20M	390 (330 – 490)	M40	
K Cast Iron	VP10RT	390 (330 – 490)	K01	
	VP15TF	390 (330 – 490)	K10	VP10RT
	VP20RT	390 (330 – 490)	K20	VP15TF, VP20RT
			K30	
S Heat Resistant Alloy	MP9005	180 (90 – 260)	S01	NEW MP9005, VP05RT, NEW MP9015, VP10RT
	MP9015	150 (75 – 245)	S10	
	VP15TF	130 (65 – 165)	S20	VP15TF, VP20RT
	VP20RT	130 (65 – 165)	S30	

■ = MIRACLE SIGMA

ISO Turning Inserts for Difficult to Cut Materials

NEW **MP9005/MP9015**





MIRACLE SIGMA

ISO Grade	Grade	Concept	Application
S01	**MP9005**	Top-quality grade focusing on wear resistance	Heat resistant alloy Finish - Medium cutting
S10	**MP9015**	First recommendation for general applications	Heat resistant alloy Medium - Rough cutting

CERMET

- The optimized alloy structure and special alloy binder improves both wear and fracture resistance.
- Cermet grades cover a wide application range and reduce the number of tools required.
- NX3035 for wet cutting.
- NX2525 for dry cutting.

SELECTION STANDARD

TURNING

Work Material		Cutting Mode	Recommended Grade	Recommended Cutting Speed (SFM)	ISO	Application Range
P	Steel	Continuous Cutting	**NX2525**	820 (655 – 920)	P01	NX2525
					P10	
		Interrupted Cutting	**NX3035**	590 (330 – 820)	P20	NX3035
K	Cast Iron Ductile Cast Iron	Finishing	**NX2525**	690 (555 – 755)	K01	NX2525
					K10	
					K20	

GRADE CHARACTERISTICS

Grade	Hardness (HRA)	T.R.S(GPa)	Thermal Conductivity (W/m·K)*	Thermal Expansion (x 10^{-6}/K)
NX2525	92.2	2.0	33	7.8
NX3035	91.5	2.1	35	7.8

* 1GPa=102kg/mm^2, 1W/m · K=2.39 x 10^{-3}cal/cm · sec · ℃

COATED CERMET

- Coated cermet (PVD coating) has superior wear and fracture resistance, and therefore provides a stable cutting performance.

SELECTION STANDARD

TURNING

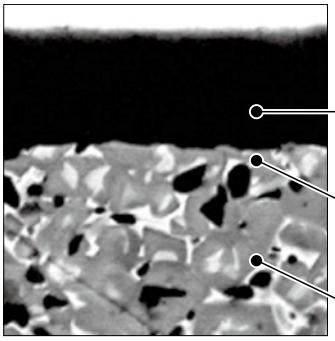
Work Material		Cutting Mode	Recommended Grade	Recommended Cutting Speed (SFM)	ISO	Application Range
P	Steel	Continuous Cutting	**VP25N AP25N**	920 (655 – 1050)	P01	VP25N, AP25N
					P10	
		Interrupted Cutting	**MP3025**	590 (460 – 655)	P20	MP3025, VP45N
					P30	
K	Cast Iron Ductile Cast Iron	Finishing	**VP25N AP25N**	720 (555 – 820)	K01	VP25N, AP25N
					K10	
					K20	

Effective for production of small parts.

MP3025

MP3025 features improved adhesion of the PVD coating to a newly-developed cermet substrate. Uniform flank wear allows prolonged machining while maintaining excellent surface finish.





CEMENTED CARBIDE

- Available in this range are UTi20T grades suitable for steel and cast iron, HTi grades for cast iron, non ferrous metal and nonmetals, and RT grades for heat-resistant alloys and titanium alloy.

SELECTION STANDARD

TURNING

Work Material		Recommended Grade	Recommended Cutting Speed (SFM)	ISO	Application Range
P	Steel	**UTi20T**	330 (195 – 425)	P10	
				P20	UTi20T
				P30	
M	Stainless Steel	**UTi20T**	330 (195 – 425)	M10	
				M20	UTi20T
				M30	
K	Cast Iron	**HTi05T**	390 (260 – 490)	K01	HTi05T
		HTi10	330 (165 – 490)	K10	HTi10
		UTi20T	330 (165 – 490)	K20	UTi20T
				K30	
N	Non-Ferrous Metal	**HTi10**	1970 (1210 – 2630)	N01	
				N10	HTi10
				N20	
				N30	
S	Heat-resistant Alloy Ti Alloy	**RT9005**	230 (165 – 330)	S01	
		MT9015	195 (130 – 260)	S10	RT9005 / NEW MT9015 / RT9010
				S20	
		TF15	165 (130 – 230)	S30	TF15

MAIN COMPONENT AND APPLICATION

ISO	Main Component	Characteristics	Application
P M	WC-TiC-TaC-Co	High heat resistance and rigidity.	Carbon steel, alloy steel, stainless steel and cast iron
K N	WC-Co	High rigidity and wear resistance.	Cast iron, non-ferrous metals, and non-metal
S	WC-Co	High heat resistance and wear resistance.	Heat-resistant alloy and Ti alloy

GRADE CHARACTERISTICS

ISO	Grade	Hardness (HRA)	Thermal Conductivity (W/m·K)*	Thermal Expansion ($x10^{-6}$/K)	Young's Modulus (GPa)*	T.R.S (GPa)*
P M	**UTi20T**	90.5	38	5.5	520	2.0
K N	**HTi05T**	92.5	79	4.5	600	1.5
	HTi10	92.0	79	4.6	630	2.0
S	**RT9005**	92.2	79	4.5	600	2.0
	MT9015/RT9010	92.0	79	4.6	630	2.2
	TF15	91.5	71	5.3	580	2.5

* 1GPa = 102kg/mm^2, 1W/m · K=2.39 x 10^{-3}cal/cm · sec · ℃

MICRO-GRAIN CEMENTED CARBIDE

● Compared to general cemented carbide, micro-grain alloy has higher wear resistance and higher toughness.

SELECTION STANDARD

Cutting Tool	Recommended Grade	Work Material
Turning Inserts Milling Inserts	**TF15**	Steel · Cast Iron Heat-resistant Alloy Ti Alloy

GRADE CHARACTERISTICS

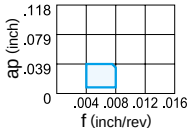
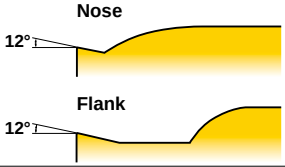
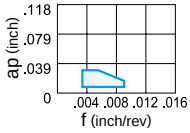
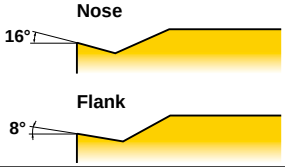
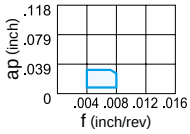
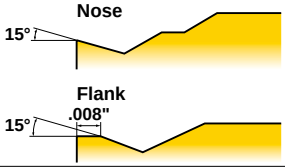
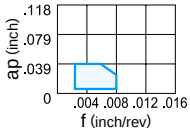
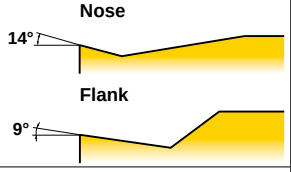
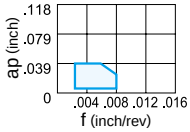
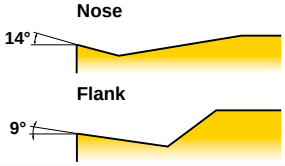
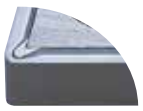
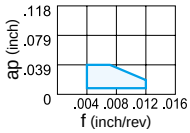
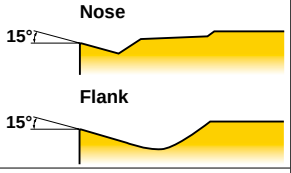
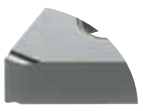
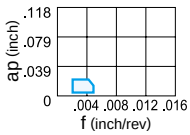
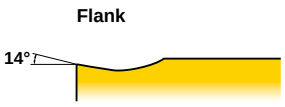
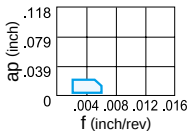
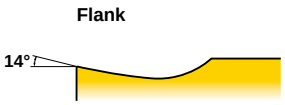
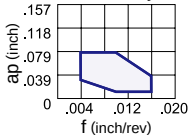
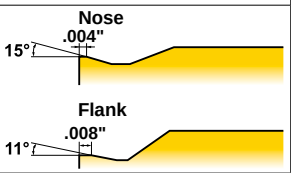
Grade	Grade Characteristics			ISO	Wear Resistance	Fracture Resistance	Corrosion Resistance
	Specific Gravity	Hardness (HRA)	T.R.S (Gpa)*				
TF15	**14.5**	91.5	2.5	K20	◎	○	◎

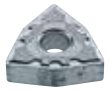
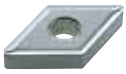
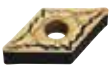
* 1GPa=102kg/mm^2

Memo

CLASSIFICATION

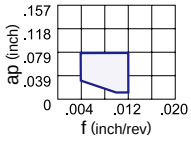
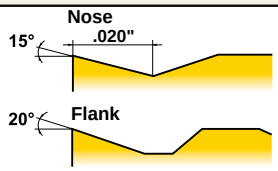
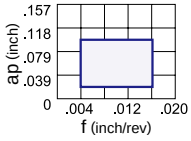
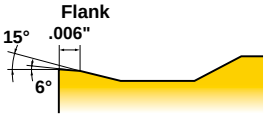
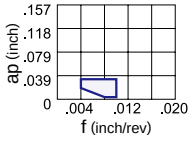
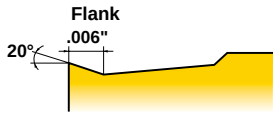
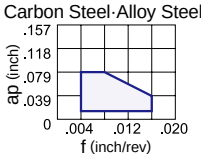
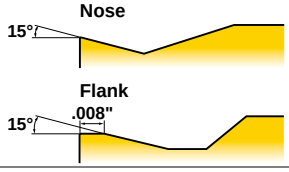
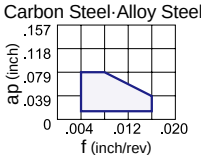
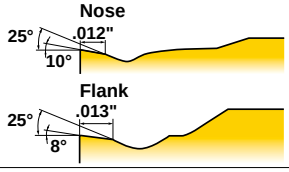
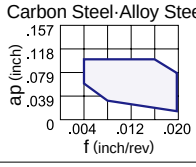
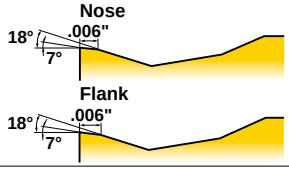
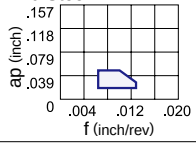
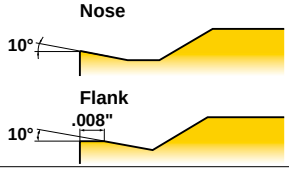
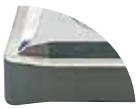
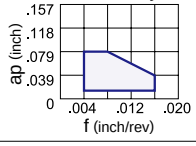
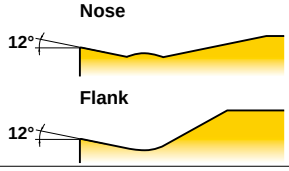
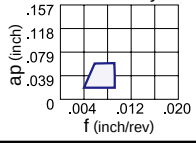
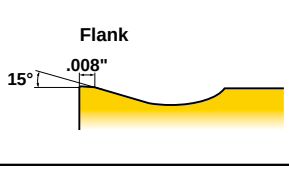
NEGATIVE INSERTS WITH HOLE

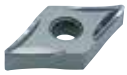
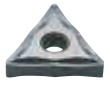
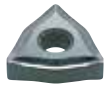
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M Class	**FH** 	**First recommendation for finishing carbon steel, alloy steel and stainless steel** Double sided chipbreaker. Stable chip control even at small depth of cut.	Carbon Steel·Alloy Steel  
		FS 	**Alternative breaker for finishing mild steel** Double sided chipbreaker. Stable chip control even at small depth of cut. Sharp edge gives best performance.	Mild Steel  
		FY 	**First recommendation for finishing mild steel** Double sided chipbreaker. Effectively controls chips. Suitable for mild steel finishing.	Mild Steel  
	G Class	**FJ** 	**First recommendation for finishing difficult-to-cut materials** Double sided chipbreaker. Ideal for heat-resistant alloy. The sharp edge produces good cutting surface. The curved edge allows smooth chip discharge.	Difficult-to-Cut Materials  
		FJ-P 	**First recommendation for finishing titanium alloy** Double sided chipbreaker. Ideal for aluminum and copper. The sharp edge produces excellent surface finishes. The curved edge allows smooth chip discharge. The polished insert face prevents built up edge.	Titanium alloy  
		PK 	**Alternative breaker for finishing carbon steel and alloy steel** Double sided chipbreaker. G class insert tolerance is suitable for workpieces requiring close dimensional tolerances. Stable chip control even at small depth of cut.	Carbon Steel·Alloy Steel  
		R/L FS 	**Precise finishing** Double sided chipbreaker. A narrow angled chipbreaker for good control. The sharp edge produces a good surface finish.	Carbon Steel·Alloy Steel  
		R/L F 	**Finishing** Double sided chipbreaker. Angled chipbreaker controls chip flow. The sharp edge produces a good chip discharge.	Carbon Steel·Alloy Steel  
Light Cutting	M Class	**LP** 	**First recommendation for light cutting of carbon steel and alloy steel** Double sided chipbreaker. Stable chip control in light cutting range. The curved edge allows smooth chip discharge.	Carbon Steel·Alloy Steel  

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CNMG_FH  A096	DNMG_FH  A103	SNMG_FH  A111	TNMG_FH  A117	VNMG_FH  A124	WNMG_FH  A128	
	CNMG_FS  A096	DNMG_FS  A103	SNMG_FS  A111	TNMG_FS  A117	VNMG_FS  A124	WNMG_FS  A128	
	CNMG_FY  A096	DNMG_FY  A103		TNMG_FY  A117		WNMG_FY  A128	
	CNGG_FJ  A096	DNGG_FJ  A103			VNGG_FJ  A124		
	CNGG_FJ-P  A096						
	CNGG_PK  A096	DNGG_PK  A103		TNGG_PK  A117			
				TNGG_R/L FS  A117			
				TNGG_R/L F  A117	VNGG_R/L-F  A124		
	CNMG_LP  A097	DNMG_LP  A104	SNMG_LP  A111	TNMG_LP  A118	VNMG_LP  A124	WNMG_LP  A128	

CLASSIFICATION

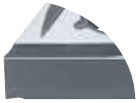
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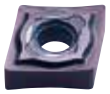
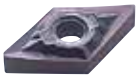
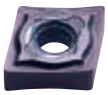
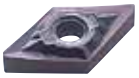
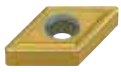
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Light Cutting	M Class	**LM** 	**First recommendation for light cutting of stainless steel** Double sided chipbreaker. Stable chip control in light cutting range. Breaker with high rake angle provides excellent burr control.	Stainless Steel  
		LK NEW 	**First recommendation for light cutting of cast iron** Narrow positive land provides low cutting resistance and excellent finish.	Cast Iron  
		LS NEW 	**First recommendation for light cutting of difficult-to-cut materials** Enhanced chip disposal for depth of cut smaller than the corner R.	 
		SH 	**First recommendation for light cutting of carbon steel, alloy steel and stainless steel** Double sided chipbreaker. Can be used at low depth of cuts and high feed rates. The curved edge allows smooth chip discharge. Recommended for workpieces in the 160—250HB range.	Carbon Steel·Alloy Steel  
		SA 	**Alternative breaker for light cutting of carbon steel and alloy steel** Double sided chipbreaker. Superior chip control at small depth of cuts. Covers copying and back turning with wavy edge. Recommended for workpieces in the 200—300HB range.	Carbon Steel·Alloy Steel  
		SW 	**Wiper insert for light cutting of carbon steel and alloy steel** Double sided chipbreaker. The wiper allows up to two times higher feed. Wiper design for increased productivity and improved surface finish.	Carbon Steel·Alloy Steel  
		SY 	**First recommendation for light cutting of mild steel** Double sided chipbreaker. Effectively controls chips. Recommended for workpieces in the 200—300HB range.	Mild Steel  
		C 	**Alternative breaker for light cutting of carbon steel and alloy steel** Double sided chipbreaker. Can be used at small depth of cuts. The curved edge allows smooth chip discharge.	Carbon Steel·Alloy Steel  
		R/L 1G 	**Alternative chipbreaker for light cutting of carbon steel and alloy steel** Double sided chipbreaker. Angled chipbreaker controls chip flow. Excellent chip control at low to medium feed rates.	Carbon Steel·Alloy Steel  

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CNMG_LM  A097	DNMG_LM  A104	SNMG_LM  A111	TNMG_LM  A118	VNMG_LM  A124	WNMG_LM  A128	
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	CNMG_LS NEW  A097	DNMG_LS NEW  A104		TNMG_LS NEW  A118	VNMG_LS NEW  A125	WNMG_LS NEW  A129	
	CNMG_SH  A097	DNMG_SH  A105	SNMG_SH  A111	TNMG_SH  A118	VNMG_SH  A125	WNMG_SH  A129	
	CNMG_SA  A097	DNMG_SA  A105	SNMG_SA  A112	TNMG_SA  A118	VNMG_SA NEW  A125	WNMG_SA  A129	
	CNMG_SW  A097	DNMX_SW  A105		TNMX_SW  A119		WNMG_SW  A129	
	CNMG_SY  A097	DNMG_SY  A105	SNMG_SY  A112	TNMG_SY  A119		WNMG_SY  A129	
	CNMG_C  A098	DNMG_C  A105	SNMG_C  A112	TNMG_C  A119		WNMG_C  A129	
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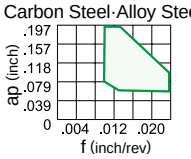
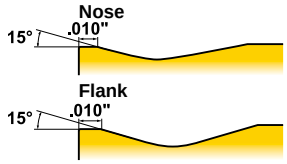
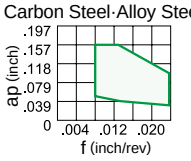
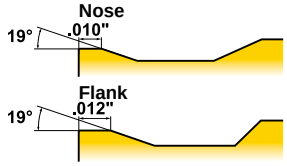
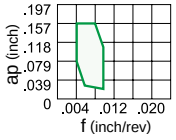
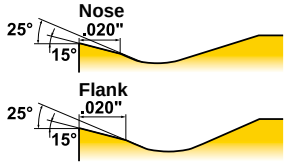
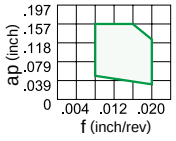
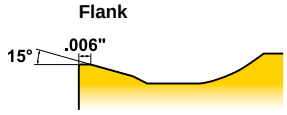
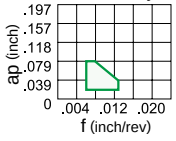
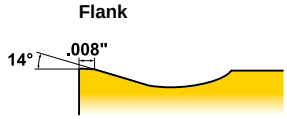
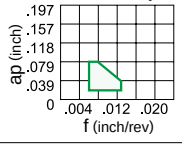
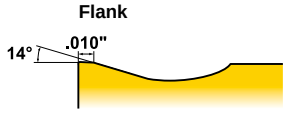
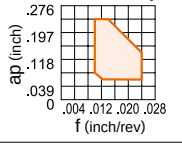
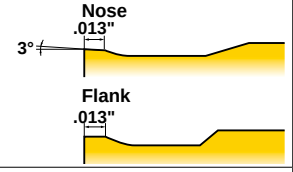
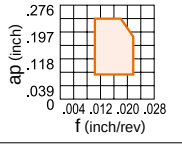
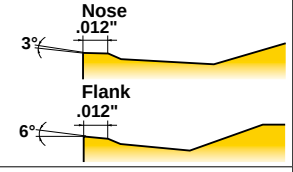
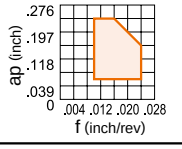
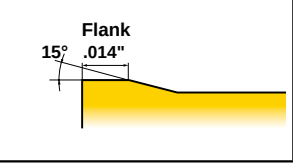
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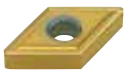
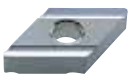
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Light Cutting	G Class	**R/L K** 	**Light cutting** Double sided chipbreaker. Parallel chipbreaker. Excellent chip control at low to medium feed rates.	Carbon Steel·Alloy Steel ap (inch) .157 .118 .079 .039 0 .004 .012 .020 f (inch/rev) Flank .010" 14°
Light Cutting	M Class	**MJ** 	**First recommendation for light cutting of difficult-to-cut materials** Double sided chipbreaker. Ideal for heat-resistant alloy and titanium alloy. The sharp edge produces excellent surface finishes. The curved edge allows smooth chip discharge.	Difficult-to-Cut Materials ap (inch) .157 .118 .079 .039 0 .004 .012 .020 f (inch/rev) Nose 13° Flank 9°
Light Cutting	G Class	**MJ** 	**First recommendation for light cutting of difficult-to-cut materials** Double sided chipbreaker, Single sided chipbreaker. G class insert tolerance is suitable for workpieces requiring close dimensional tolerances. Ideal for heat-resistant alloy and titanium alloy. The sharp edge produces excellent surface finishes.	Difficult-to-Cut Materials ap (inch) .157 .118 .079 .039 0 .004 .012 .020 f (inch/rev) Nose 13° Flank 9°
Medium Cutting	M Class	**MP** 	**Alternative breaker for medium cutting of carbon steel and alloy steel** Double sided chipbreaker. Suitable for medium to light cutting. Breaker geometry appropriate for copying and back turning. Good balance of sharpness and strength.	Carbon Steel·Alloy Steel ap (inch) .197 .157 .118 .079 .039 0 .004 .012 .020 f (inch/rev) Nose .006" 15° Flank .008" 11°
Medium Cutting	M Class	**MM** 	**Breaker with high rake angle reduces burr formation** Double sided chipbreaker. Simulation analysis technology assisted in the development of an optimized cutting edge land geometry, preventing plastic deformation and extending tool life.	Stainless Steel ap (inch) .197 .157 .118 .079 .039 0 .004 .012 .020 f (inch/rev) Nose .012" 6° Flank .012" 10°
Medium Cutting	M Class	NEW **MK** 	**First recommendation for medium cutting of cast iron** Optimum balance between sharpness and high edge strength for general use.	Cast Iron ap (inch) .197 .157 .118 .079 .039 0 .004 .012 .020 f (inch/rev) Flank .010" 15° 3°
Medium Cutting	M Class	**GM** 	**Alternative chip breaker for light to medium cutting of stainless steel** Double sided chipbreaker. Alternate chip breaker to main chip breakers LM and MM. Excellent notch wear resistance for light to medium cutting.	Stainless Steel ap (inch) .197 .157 .118 .079 .039 0 .004 .012 .020 f (inch/rev) Nose .020" 25° 15° Flank .020" 25° 15°
Medium Cutting	M Class	**MA** 	**First recommendation for medium cutting of carbon steel and alloy steel** **First recommendation for finish to light cutting of cast iron** Double sided chipbreaker. Positive land provides sharp cutting action.	Carbon Steel·Alloy Steel ap (inch) .197 .157 .118 .079 .039 0 .004 .012 .020 f (inch/rev) Nose .008" 22° 6° Flank .008" 22° 6°
Medium Cutting	M Class	**MH** 	**First recommendation for medium-heavy cutting of mild steel** **Alternative breaker for medium cutting of carbon steel and alloy steel** Double sided chipbreaker. Flat land offers high edge strength. A wide chip pocket prevents chip jamming at large depth of cut.	Carbon Steel·Alloy Steel ap (inch) .197 .157 .118 .079 .039 0 .004 .012 .020 f (inch/rev) Nose .010" 16° Flank .014" 16°

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
				TNGG_R/L K  A119			
	CNMG_MJ  A098	DNMG_MJ  A105		TNMG_MJ  A119	VNMG_MJ  A125	WNMG_MJ  A129	
	CNGG_MJ  A098	DNGM_MJ  A106			VNGM_MJ  A125		
	CNMG_MP  A098	DNMG_MP  A106	SNMG_MP  A112	TNMG_MP  A119	VNMG_MP  A125	WNMG_MP  A130	
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	CNMG_GM  A099	DNMG_GM  A107	SNMG_GM  A113	TNMG_GM  A120	VNMG_GM  A126	WNMG_GM  A130	
	CNMG_MA  A099	DNMG_MA  A107	SNMG_MA  A113	TNMG_MA  A120	VNMG_MA  A126	WNMG_MA  A131	
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CLASSIFICATION

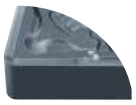
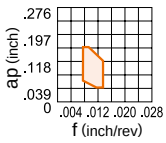
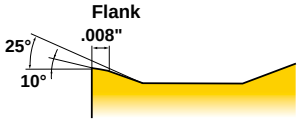
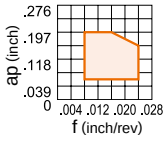
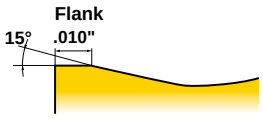
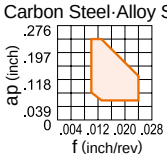
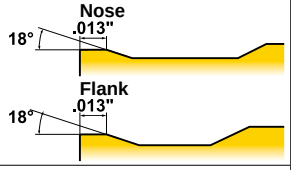
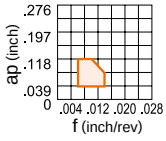
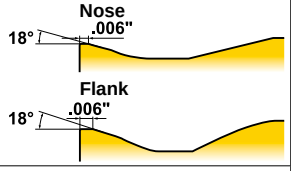
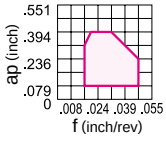
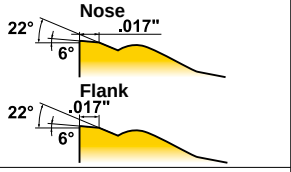
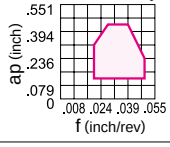
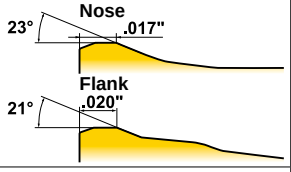
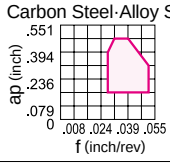
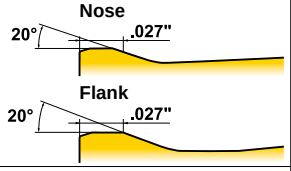
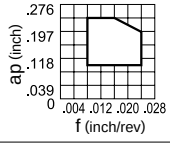
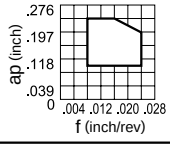
NEGATIVE INSERTS WITH HOLE

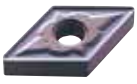
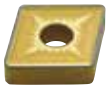
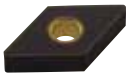
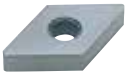
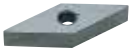
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M Class	**Standard** 	**First recommendation for medium cutting of cast iron Alternative breaker for medium cutting of carbon steel and alloy steel** Double sided chipbreaker. Flat land offers high edge strength.	Carbon Steel·Alloy Steel  
		MW 	**Wiper insert for medium cutting carbon steel and alloy steel** Double sided chipbreaker. The wiper allows up to two times higher feed. A wide chip pocket prevents chip jamming.	Carbon Steel·Alloy Steel  
		MS 	**First recommendation for medium cutting of stainless steel, mild steel and difficult-to-cut materials** Double sided chipbreaker. The sharp edge gives best performance.	Stainless Steel  
		R/L ES 	**Alternative chipbreaker for medium cutting of stainless steel** Double sided chipbreaker. Good balance of edge strength and sharpness. Right- or left-hand breaker for unidirectional chip control.	Stainless Steel  
		R/L 2G 	**Alternative chipbreaker for medium cutting of carbon steel and alloy steel** Double sided chipbreaker. Parallel chipbreaker controls chip flow. Good chip control for medium feed rates.	Carbon Steel·Alloy Steel  
	G Class	**R/L** 	**Medium cutting** Double sided chipbreaker. Parallel chipbreaker. Good chip control for medium feed rate.	Carbon Steel·Alloy Steel  
Rough Cutting	M Class	**RP** 	**First recommendation for rough cutting of carbon and alloy steel** Double sided chipbreaker. For interrupted cutting and cutting through scale. Good balance of cutting edge strength and low cutting resistance.	Carbon Steel·Alloy Steel  
		RM 	**First recommendation for rough cutting of stainless steel** Double sided chipbreaker. Excellent fracture resistance during interrupted cutting due to the optimum cutting edge land angle and honing geometry.	Stainless Steel  
		NEW **RK** 	**First recommendation for rough cutting of cast iron** Seating surface and wide land 3 or more times that of conventional products provides high cutting stability for interrupted machining and scale removal.	Cast Iron  

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CNMG	DNMG	SNMG	TNMG	VNMG	WNMG	RNMG
							
	A099, A100	A107	A114	A121	A126	A131	A110
	CNMG_MW	DNMX_MW		TNMX_MW		WNMG_MW	
							
	A100	A107		A121		A131	
	CNMG_MS	DNMG_MS	SNMG_MS	TNMG_MS	VNMG_MS	WNMG_MS	
							
	A100	A108	A114	A121	A127	A131	
				TNMG_R/L ES			
							
				A121			
				TNMG_R/L 2G			
							
				A121			
		DNGG_R/L	SNGG_R/L	TNGG_R/L	VNGG_R/L		
							
		A108	A114	A122	A127		
	CNMG_RP	DNMG_RP	SNMG_RP	TNMG_RP		WNMG_RP	
							
	A101	A108	A115	A122		A131	
	CNMG_RM	DNMG_RM	SNMG_RM	TNMG_RM		WNMG_RM	
							
	A101	A108	A115	A122		A132	
	CNMG_RK	DNMG_RK	SNMG_RK	TNMG_RK		WNMG_RK	
							
	A101	A109	A115	A123		A132	

CLASSIFICATION

NEGATIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Rough Cutting	M Class	NEW **RS** 	**First recommendation for rough cutting of difficult-to-cut materials** Seating surface and land width 3 or more times that of conventional products and provides high cutting stability for interrupted machining and scale removal.	 
		NEW **GK** 	**First recommendation for rough cutting of cast iron** Positive land increases welding resistance and suppresses chip welding and abrasion at low speed cutting.	Cast Iron  
		GH 	**First recommendation for rough cutting of carbon steel, alloy steel and stainless steel** Double sided chipbreaker. For interrupted cut and removing scale. A combination of wide land and large chip pocket allows high feeds.	Carbon Steel·Alloy Steel  
		GJ 	**First recommendation for rough cutting of difficult-to-cut materials** Double sided chipbreaker. Excellent balance of edge sharpness and strength. Edge geometry with high face wear resistance.	Difficult-to-Cut Materials  
Heavy Cutting	M Class	**HZ** 	**First recommendation for heavy cutting of mild steel and stainless steel** Single sided chipbreaker. Appropriate for the lower end of the heavy cutting region. Low cutting resistance due to positive land and curved edge. Teardrop dots improve chip control without increasing cutting resistance.	Mild Steel  
		HX 	**First recommendation for heavy cutting of carbon steel and alloy steel** Single sided chipbreaker. Appropriate for the medium range of the heavy cutting region. The flat edge and chamfer provide a balance of sharpness and strength. Variable land and a wavy chipbreaker for good chip control.	Carbon Steel·Alloy Steel  
		HV 	**Alternative chipbreaker for heavy cutting of carbon steel and alloy steel** Single sided chipbreaker. Appropriate for the upper end of the heavy cutting region. Wide land and large chamfer offer high edge strength. A wide chipbreaker prevents chip jamming.	Carbon Steel·Alloy Steel  
For Cast Iron	M Class	**Flat Top** 	**First recommendation for rough cutting of cast iron** Double sided flat insert. Most effective in unstable machining i.e. interrupted cuts due to high edge strength and stable fitting on the shim.	Cast Iron  
	G Class	**Flat Top** 	**For cast iron** Double sided flat insert. Most effective in unstable machining i.e. interrupted cuts due to high edge strength and stable fitting on the shim. G class tolerance for use on workpieces requiring close tolerances.	Cast Iron  

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CNMG_RS NEW  A101	DNMG_RS NEW  A109	SNMG_RS NEW  A115	TNMG_RS NEW  A123		WNMG_RS NEW  A132	
	CNMG_GK NEW  A099	DNMG_GK NEW  A106	SNMG_GK NEW  A113	TNMG_GK NEW  A120	VNMG_GK NEW  A126	WNMG_GK NEW  A130	
	CNMG_GH  A101	DNMG_GH  A109	SNMG_GH  A115	TNMG_GH  A123		WNMG_GH  A132	
	CNMG_GJ  A101	DNMG_GJ  A109				WNMG_GJ  A132	
	CNMM_HZ  A102	DNMM_HZ  A109	SNMM_HZ  A115	TNMM_HZ  A123			
	CNMM_HX  A102		SNMM_HX  A115				
	CNMM_HV  A102		SNMM_HV  A116				
	CNMA  A102	DNMA  A109	SNMA  A116	TNMA  A123		WNMA  A132	
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CLASSIFICATION

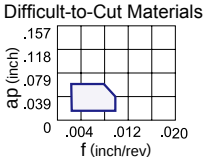
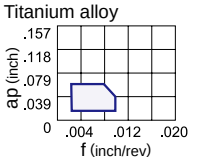
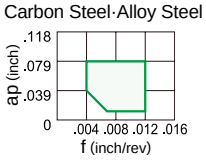
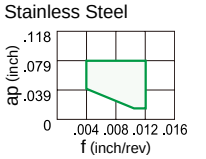
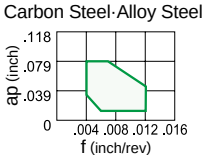
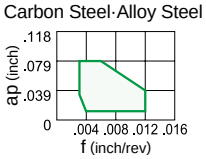
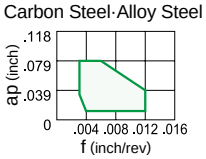
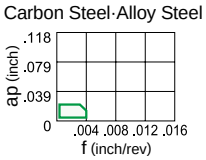
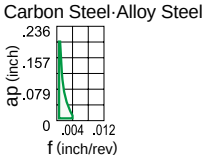
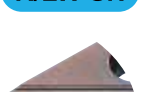
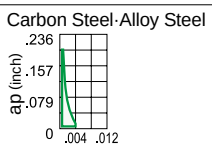
5° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M Class	FP	**First recommendation for finishing carbon steel and alloy steel** Chip breaker peninsula controls chips even at small depth of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Carbon Steel·Alloy Steel ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (inch/rev) Nose 6° Flank 6°
		FM	**First recommendation for finishing stainless steel** Chip breaker peninsula controls chips even at small depth of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Stainless Steel ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (inch/rev) Nose 6° Flank 6°
		FV	**First recommendation for finishing carbon steel, alloy steel, mild steel and stainless steel** Suitable for low depth of cut and feed rate applications. Sharp cutting edge and low resistance design provide excellent cutting performance.	Carbon Steel·Alloy Steel ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (inch/rev) Nose 18° Flank 8°
	G Class	FJ	**Finishing difficult-to-cut materials** The curved cutting edges support changes in cutting depth, smooth chip discharge and disposal. The high rake angle is highly suitable for finishing diffcult-to-cut materials.	Difficult-to-Cut Materials ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (inch/rev) Nose 14° Flank 14°
		FJ-P	**Finishing titanium alloy** Ideal for aluminum and copper. The sharp edge produces excellent surface finishes. The curved edge allows smooth chip discharge. The polished insert face prevents built up edge.	Titanium alloy ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (inch/rev) Nose 14° Flank 14°
		R/L F	**Finishing carbon steel and alloy steel** Angled chipbreaker controls chip flow. Sharp cutting edge produces excellent surface finishes.	Carbon Steel·Alloy Steel ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (inch/rev) Flank 13°
Light Cutting	M Class	LP	**First recommendation for light cutting of carbon and alloy steel** Sharp cutting edge due to a high rake angle. Prevents chip welding on cutting edge and controls cloudiness of surface finish. Chip breaker peninsula matched to depth of cut capability provides excellent chip control.	Carbon Steel·Alloy Steel ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (inch/rev) Nose 18° Flank 8°
		LM	**First recommendation for light cutting of stainless steel** Sharp cutting edge due to a high rake angle. Prevents chip welding on cutting edge and controls cloudiness of surface finish. Chip breaker peninsula matched to depth of cut capability provides excellent chip control.	Stainless Steel ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (inch/rev) Nose 18° Flank 8°
		SV	**Light cutting of carbon steel, alloy steel, mild steel and stainless steel** The double breaker design promotes chip discharge for mild steel low depth of cut a applications.	Carbon Steel·Alloy Steel ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (inch/rev) Nose 18° Flank 8°

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
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					VBMT_FM  A162		
					VBMT_FV  A162		
					VBGT_FJ  A162		
					VBGT_FJ-P  A162		
					VBGT_R/L F  A163	**WBGT_R/L F**  A170	
					VBMT_LP  A163		
					VBMT_LM  A163		
					VBMT_SV  A163		

CLASSIFICATION

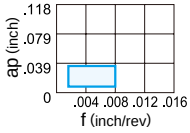
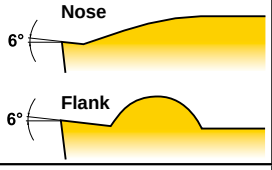
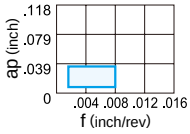
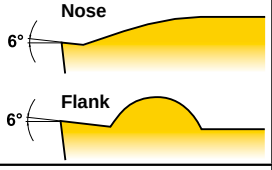
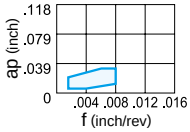
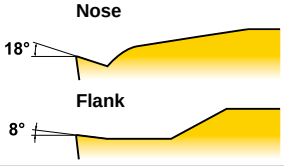
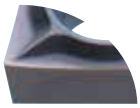
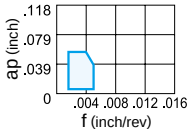
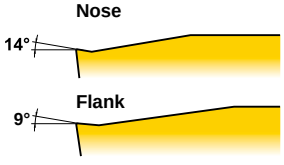
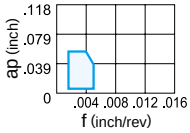
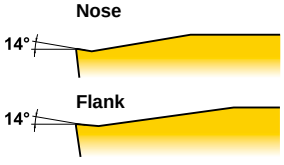
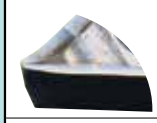
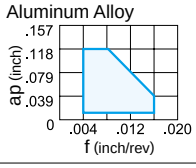
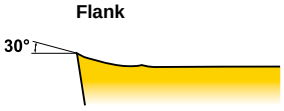
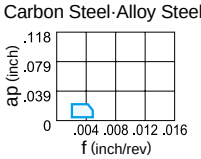
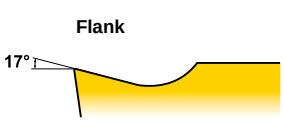
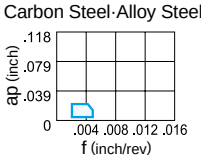
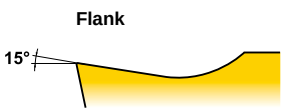
5° POSITIVE INSERTS WITH HOLE

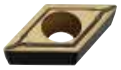
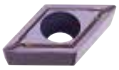
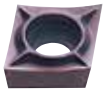
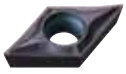
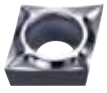
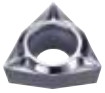
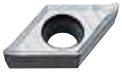
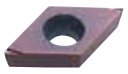
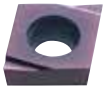
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Light Cutting	G Class	**MJ** 	**Light cutting of difficult-to-cut materials Ideal for heat-resistant alloy and titanium alloy** The curved cutting edges support changes in cutting depth, smooth chip discharge and disposal. The high rake angle is highly suitable for finish-light cutting difficult-to-cut materials.	Difficult-to-Cut Materials 
		MJ-P 	**Light cutting for titanium alloy** Ideal for aluminum and copper. The sharp edge produces excellent surface finishes. The curved edge allows smooth chip discharge. The polished insert face prevents built up edge.	Titanium alloy 
Medium Cutting	M Class	**MP** 	**First recommendation for light cutting of carbon and alloy steel** Small, flat, land at cutting edge provides an excellent balance of wear and fracture resistance. The wide chip gullet decreases cutting resistance, reduces vibration and chip jamming in elevated depth of cut applications.	Carbon Steel·Alloy Steel 
		MM 	**First recommendation for medium cutting of stainless steel** Good balance of wear resistance and fracture resistance because of the flat land cutting edge. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depth of cut.	Stainless Steel 
		Standard 	**Medium cutting of carbon steel, alloy steel and stainless steel** The high rake angle combined with a small flat land provide a balance of strength and sharpness.	Carbon Steel·Alloy Steel 
		MV 	**Medium cutting of carbon steel, alloy steel, mild steel and stainless steel** A positive land and the high rake angle provides sharp cutting edge performance. The double breakers and round-shaped dots in the rake face provide a wide range of chip control.	Carbon Steel·Alloy Steel 
		R/L MV 	**Medium cutting of carbon steel, alloy steel, mild steel and stainless steel** A positive land and the high rake angle provides sharp cutting edge performance. The double breakers and round-shaped dots in the rake face provide a wide range of chip control.	Carbon Steel·Alloy Steel 
	E Class	**R/L SR** 	**Medium cutting for Swiss type lathe machining** Features a high angled chipbreaker. Low resistance insert design controls chip flow.	Carbon Steel·Alloy Steel 
		R/L SN 	**General purpose for Swiss type lathe machining** The parallel chipbreaker. Excellent chip control for low to midium feed rates.	Carbon Steel·Alloy Steel 
		R/LW SN 	**General purpose for Swiss type lathe machining** The parallel chipbreaker. Excellent chip control for low to medium feed rates. The wiper produces good surface finishes.	Carbon Steel·Alloy Steel 

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
					VBGT_MJ  A163		
					VBGT_MJ-P  A163		
					VBMT_MP  A163		
					VBMT_MM  A164		
					VBMT  A164		
					VBMT_MV  A164		
						WBMT_R/L MV  A170	
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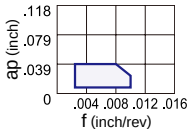
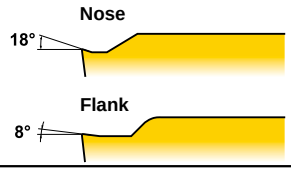
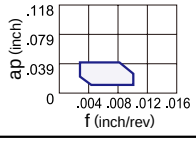
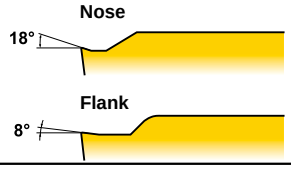
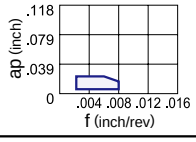
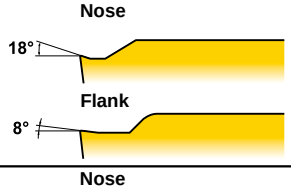
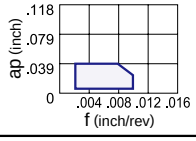
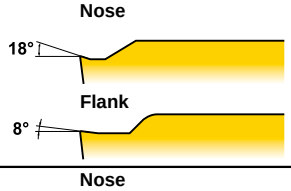
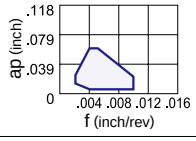
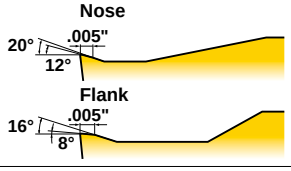
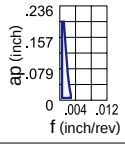
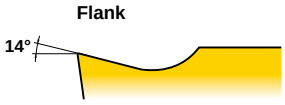
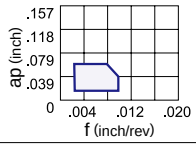
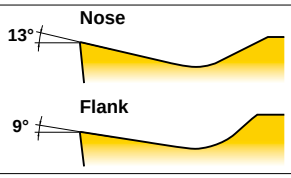
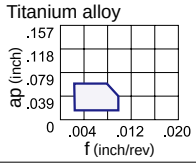
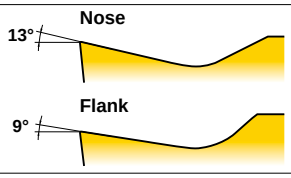
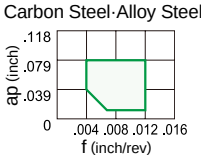
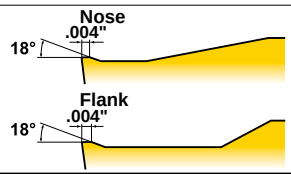
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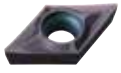
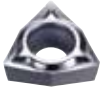
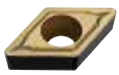
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M Class	**FP** 	**First recommendation for finishing carbon steel and alloy steel** Chip breaker peninsula controls chips even at small depth of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Carbon Steel·Alloy Steel  
		FM 	**First recommendation for finishing stainless steel** Chip breaker peninsula controls chips even at small depth of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Stainless Steel  
		FV 	**First recommendation for finishing carbon steel, alloy steel and mild steel** Sharp cutting edge and low resistance design provides excellent cutting performance. Suitable for low depth of cut and feed rate applications.	Carbon Steel·Alloy Steel  
	G Class	**FJ** 	**First recommendation for finishing difficult-to-cut materials** The curved cutting edges support changes in cutting depth and allow smooth chip discharge and disposal. The high rake angle is highly suitable for finishing diffcult-to-cut materials.	Difficult-to-Cut Materials  
		FJ-P 	**Finishing titanium alloy** Ideal for aluminum and copper. The sharp edge produces excellent surface finishes. The curved edge allows smooth chip discharge. The polished insert face prevents built up edge.	Titanium alloy  
		AZ 	**First recommendation for aluminium alloy** The high rake angle and 3D curved cutting edge provides sharpness at the cutting point. Additionally the 3D shape of the rake face enables excellent chip control. The polished insert face prevents built up edge.	Aluminum Alloy  
		R/L F 	**Finishing carbon steel and alloy steel** Angled chipbreaker controls chip flow. Sharp cutting edge provides excellent surface finishes.	Carbon Steel·Alloy Steel  
		R/L 	**Finishing** Angled chipbreaker. Excellent chip control at low feed rates.	Carbon Steel·Alloy Steel  

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Rhombic 25°	Round
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	CCMT_FM  A136	DCMT_FM  A144	SCMT_FM  A152	TCMT_FM  A155	VCMT_FM  A166			
	CCMT_FV  A136	DCMT_FV  A144	SCMT_FV  A152	TCMT_FV  A155	VCMT_FV  A166			
	CCGT_FJ  A136	DCMT_FJ  A144						
	CCGT_FJ-P  A136	DCMT_FJ-P  A144		TCGT_FJ-P  A155		WCGT_FJ-P  A171		
	CCGT_AZ  A137	DCGT_AZ  A145		TCGT_AZ  A155	VCGT_AZ  A166			RCGT-AZ  A151
	CCGT_L F  A137	DCGT_R/L F  A145		TCGT_R/L F  A156	VCGT_R/L F  A166			
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CLASSIFICATION

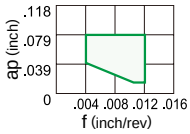
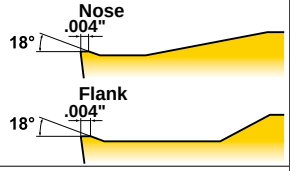
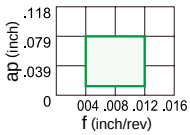
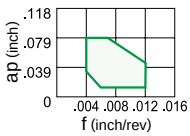
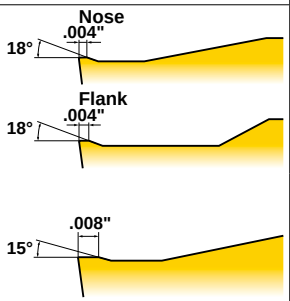
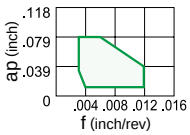
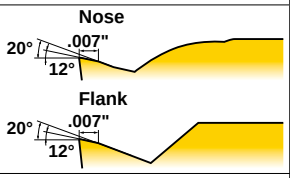
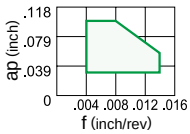
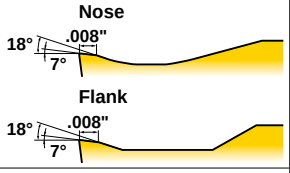
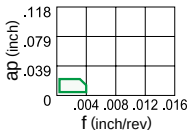
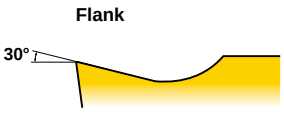
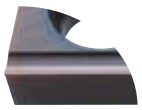
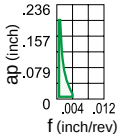
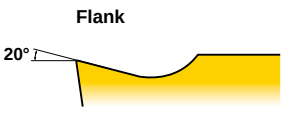
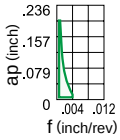
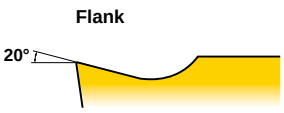
7° POSITIVE INSERTS WITH HOLE

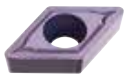
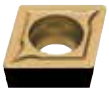
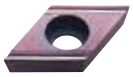
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Light Cutting	M Class	**LP** 	**First recommendation for light cutting of carbon and alloy steel** Sharp cutting edge due to a high rake angle. Prevents chip welding on cutting edge and controls cloudiness of surface finish. Chip breaker peninsula matched to depth of cut capability provides excellent chip control.	Carbon Steel·Alloy Steel  
		LM 	**First recommendation for light cutting of stainless steel** Sharp cutting edge due to a high rake angle. Prevents chip welding on cutting edge and controls cloudiness of surface finish. Chip breaker peninsula matched to depth of cut capability provides excellent chip control.	Stainless Steel  
		SVX 	**Light cutting of carbon steel and alloy steel** Breaker geometry appropriate for copying. Excellent chip control.	Carbon Steel·Alloy Steel  
		SV 	**Alternative chipbreaker for light cutting of carbon steel, alloy steel, mild steel and stainless steel** The double breaker design promotes chip control in mild steel and low depth of cut machining applications.	Carbon Steel·Alloy Steel  
		SW 	**Wiper insert for light cutting of carbon steel, alloy steel, mild steel and stainless steel** The wiper allows up to two times higher feed. Positive land improves sharpness.	Carbon Steel·Alloy Steel  
	G Class	**R/L SS** 	**Light cutting for Swiss type lathe machining** The parallel chipbreaker. Excellent chip control at low feed rate.	Carbon Steel·Alloy Steel  
		MJ 	**Light cutting of difficult-to-cut materials** **Ideal for heat-resistant alloy and titanium alloy** The curved cutting edges support changes in cutting depth-smooth chip discharge and disposal. The high rake angle is highly suitable for finish- light cutting difficult-to-cut materials.	Difficult-to-Cut Materials  
		MJ-P 	**Light cutting for titanium alloy** Ideal for aluminum and copper. The sharp edge produces excellent surface finishes. The curved edge allows smooth chip discharge. The polished insert face prevents built up edge.	Titanium alloy  
Medium Cutting	M Class	**MP** 	**First recommendation for medium cutting of carbon and alloy steel** The small flat land at cutting edge provides an excellent balance of wear and fracture resistance. The wide chip gullet decreases cutting resistance, reduces vibration and chip jamming in elevated depth of cut applications.	Carbon Steel·Alloy Steel  

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Rhombic 25°	Round
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	CCMH_SV  A137	DCMT_SV  A145			VCMT_SV  A167			
	CCMT_SW  A137							
	CCGT_R/L SS  A138	DCGT_R/L SS  A145						
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CLASSIFICATION

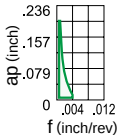
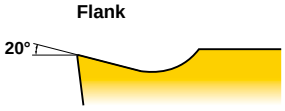
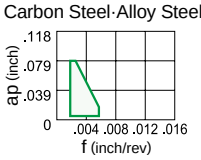
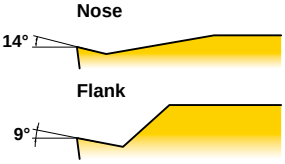
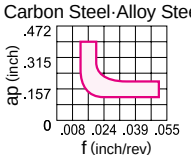
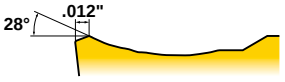
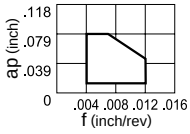
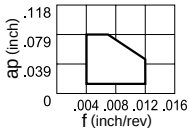
7° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M Class	**MM** 	**First recommendation for medium cutting of stainless steel** The small flat land at cutting edge provides an excellent balance of wear and fracture resistance. The wide chip gullet decreases cutting resistance, reduces vibration and chip jamming in elevated depth of cut applications.	Stainless Steel  
		NEW **MK** 	**First recommendation for medium cutting of cast iron** Optimum balance between sharpness and high edge strength for general use.	Cast Iron  
		Standard 	**First recommendation for medium cutting of carbon steel, alloy steel, mild steel, stainless steel and cast iron** The high rake angle combined with a small, flat land provide a balance of strength and sharpness.	Carbon Steel·Alloy Steel  
		MV 	**Alternative chipbreaker for medium cutting of carbon steel, alloy steel, mild steel and stainless steel** A positive land and the high rake angle provides sharp cutting edge performance. The double breakers and round-shape in the rake face provide a wide range of chip control.	Carbon Steel·Alloy Steel  
		MW 	**Wiper insert for medium cutting of carbon steel, alloy steel, mild steel and stainless steel** The wiper allows up to two times higher feed. A wide chip pocket prevents chip jamming.	Carbon Steel·Alloy Steel  
	E Class	**R/L SR** 	**Medium cutting for Swiss style lathe machining** A wide angled chipbreaker. Low resistance insert design controls chip flow.	Carbon Steel·Alloy Steel  
		R/L SN 	**General purpose for Swiss style lathe machining** The parallel chipbreaker. Excellent chip control at low to medium feed rates.	Carbon Steel·Alloy Steel  
	G Class	**R/L SN** 	**General purpose for Swiss style lathe machining** The parallel chipbreaker. Excellent chip control for low to medium feed rates.	Carbon Steel·Alloy Steel  

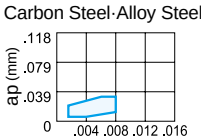
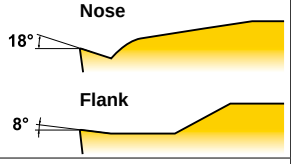
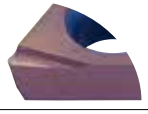
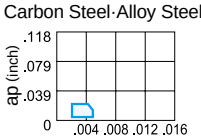
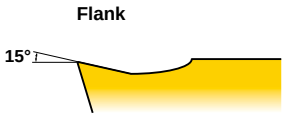
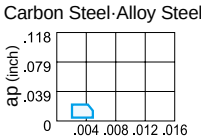
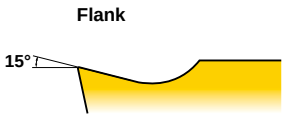
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							RCMX  A151
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	CCMT_MW  A139						
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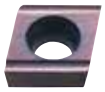
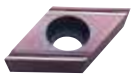
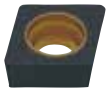
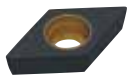
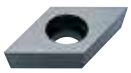
CLASSIFICATION

7° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	E Class	**R/LW SN** 	**General purpose for Swiss style lathe machining** The parallel chipbreaker. Excellent chip control for low to medium feed rates. The wiper produces good surface finish.	Carbon Steel·Alloy Steel  
Medium Cutting	G Class	**MSMG** 	**Medium cutting for Swiss style lathes machining** 3D molded chipbreaker provides good chip control. G class insert gives sharp cutting action, allowing high precision machining. Breaker geometry appropriate for copying and back turning. M = minus radius tolerance	Carbon Steel·Alloy Steel  
Heavy Cutting	M Class	**RR** 	**Heavy cutting of carbon steel and alloy steel** A wide groove chipbreaker prevents chips from jamming at large depths of cut. Small dimples improve chip control at small depths of cut.	Carbon Steel·Alloy Steel  
For Cast Iron	M Class	**Flat Top** 	**For cast iron** Most effective in unstable machining due to high edge strength.	Cast Iron  
For Cast Iron	G Class	**Flat Top** 	**For cast iron** Most effective in unstable machining due to high edge strength. G class tolerance for use on workpieces requiring close tolerances.	Cast Iron  

11° POSITIVE INSERTS WITH HOLE

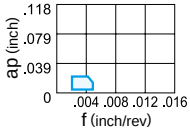
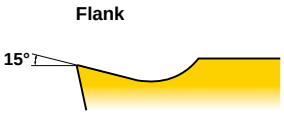
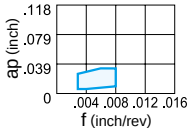
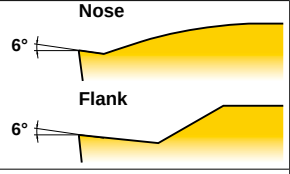
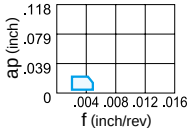
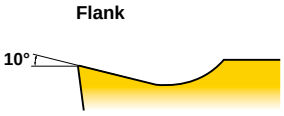
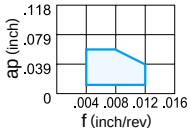
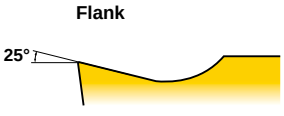
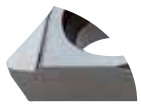
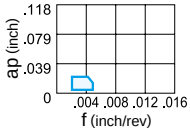
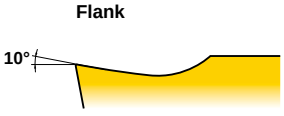
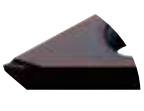
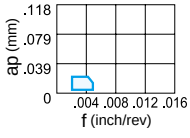
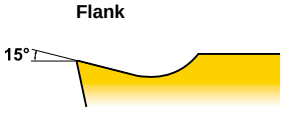
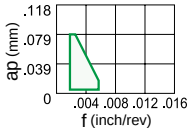
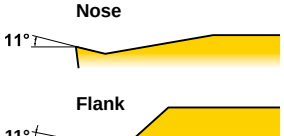
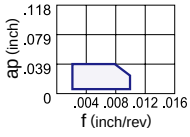
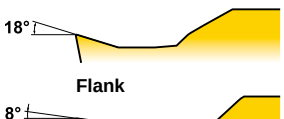
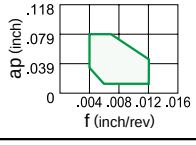
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M Class	**FV** 	**First recommendation for finishing carbon steel, alloy steel, mild steel and stainless steel** Suitable for low depth of cut and low feed rate applications. Sharp cutting edge and low resistance design achieves excellent cutting performance.	Carbon Steel·Alloy Steel  
Finish Cutting	G Class	**R/L FS** 	**First recommendation for finishing carbon steel, alloy steel, stainless steel, cast iron and aluminum alloy** Small angled chipbreaker. For precision finishing. Sharp cutting edge produces excellent surface finishes.	Carbon Steel·Alloy Steel  
Finish Cutting	M Class	**R/L F** 	**Finishing carbon steel and alloy steel** Angled chipbreaker controls chip flow. Sharp cutting edge produces excellent surface finishes.	Carbon Steel·Alloy Steel  

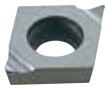
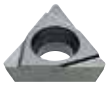
	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CCET_R/LW SN  A141	**DCET_R/LW SN**  A148					
	CCGT_MSMG  A141	**DCGT_MSMG**  A149					
							RCMX-RR  A151
	CCMW  A141	**DCMW**  A149	**SCMW**  A153	**TCMW**  A157	**VCMW**  A167		
	CCGW  A141	**DCGW**  A149					

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CPMH_FV  A142			**TPMH_FV**  A159			
				TPGH_R/L FS  A159		**WPGT_R/L FS**  A172	
	CPMH_R/L F  A142						

CLASSIFICATION

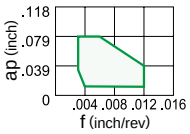
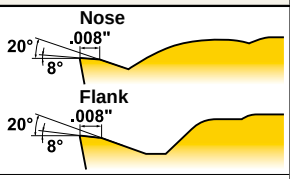
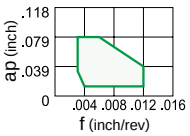
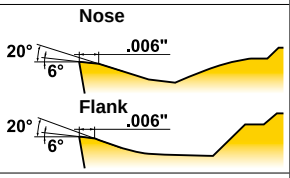
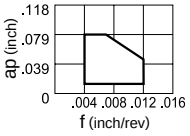
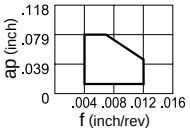
11° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	G Class	R/L F 	**Finishing carbon steel and alloy steel** Angled chipbreaker controls chip flow. Sharp cutting edge produces excellent surface finishes.	Carbon Steel·Alloy Steel  
	M Class	SQ 	**Finishing carbon steel, alloy steel and stainless steel** For small depth of cut and low feed.	Carbon Steel·Alloy Steel·Stainless Steel  
	G Class	R/L 	**Light (Finish) cutting of carbon steel and alloy steel** Angled chipbreaker. Good chip control for low to medium feed rates.	Carbon Steel·Alloy Steel  
		Standard 	**Finishing aluminum alloy** Lead chipbreaker controls chip flow. Good chip control for low to medium feed rates.	Aluminum Alloy  
	M Class	L 	**Finishing** Angled chipbreaker controls chip flow. Good chip control for low to medium feed rates.	Carbon Steel·Alloy Steel  
	E Class	SRF 	**Finishing** Lead chipbreaker controls chip flow. Sharp cutting edge produces excellent surface finishes.	Carbon Steel·Alloy Steel  
	G Class	SMG 	**Medium(Finish) cutting for Swiss style lathes machining** 3D molded chipbreaker provides good chip control. G class insert gives sharp cutting action, allowing high precision machining. Breaker geometry appropriate for copying and back turning.	Carbon Steel·Alloy Steel  
Light Cutting	M Class	SV 	**First recommendation for light cutting of carbon steel, alloy steel, mild steel, stainless steel and cast iron** The double breaker design promotes chip discharge for mild steel and low depth of cut machining applications.	Carbon Steel·Alloy Steel  
Medium Cutting	M Class	Standard 	**Alternative chipbreaker for medium cutting of carbon steel, alloy steel and stainless steel** Standard, general purpose chipbreaker.	Carbon Steel·Alloy Steel  

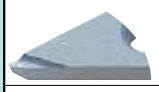
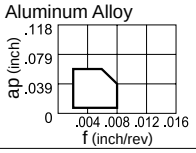
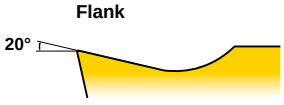
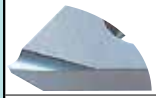
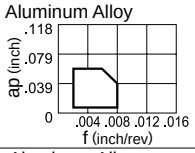
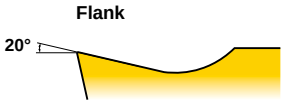
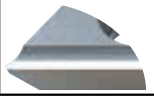
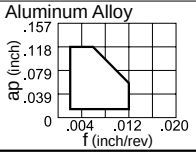
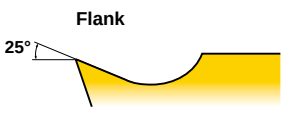
	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CPGT_R/L F  A142						
	CPMT_SQ  A142			TPMT_SQ  A159			
				TPGX_R/L  A160			
	CPGT  A142						
				TPMX_L  A160			
					VPET_SRF  A169		
					VPGT_SMG  A169		
	CPMH_SV  A142			TPMH_SV  A160			
	CPMX  A143		SPMT  A154	TPMX  A161			

CLASSIFICATION

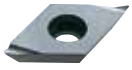
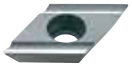
11° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M Class	**MV** 	**First recommendation for medium cutting of carbon steel, alloy steel, mild steel, stainless steel and cast iron** A positive land and the high rake angle provides sharp cutting edge performance. Double breakers in the rake face achieve a wide range of chip control.	Carbon Steel·Alloy Steel  
		MQ 	**Medium cutting of carbon steel, alloy steel and stainless steel** Can be used under a wide range of cutting conditions.	Copper  
For Cast Iron	M Class	**Flat Top** 	**Heavy cutting of cast iron** Flat top. Most effective for unstable machining due to high edge strength.	Cast Iron  
	G Class	**Flat Top** 	**For cast iron** Most effective in unstable machining due to high edge strength. G class tolerance allows use on workpieces requiring close tolerances.	Cast Iron  

15—20° POSITIVE INSERTS WITH HOLE

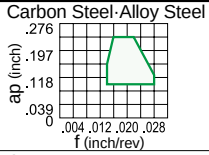
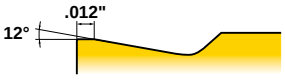
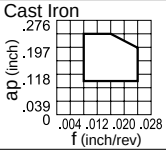
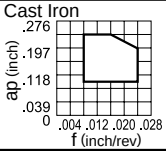
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
For Aluminum Alloy	G Class	**R/L** 	**For aluminum cutting** Angled chipbreaker. Sharp cutting edge produces excellent surface finishes.	Aluminum Alloy  
		R/L F 	**For aluminum cutting** Angled chipbreaker. Sharp cutting edge produces excellent surface finishes.	Aluminum Alloy  
		R/L 	**For aluminum cutting** Parallel chipbreaker. Sharp cutting edge produces excellent surface finishes.	Aluminum Alloy  

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CPMH_MV  A143			**TPMH_MV**  A161		**WPMT_MV**  A172	
	CPMT_MQ  A143			**TPMT_MQ**  A161			
			SPMW  A154				
			SPGX  A154	**TPGX**  A161			

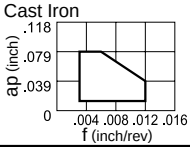
	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
					VDGX_R/L  A168		
		DEGX_R/L F  A150					
		DEGX_R/L  A150		**TEGX_R/L**  A158			

CLASSIFICATION

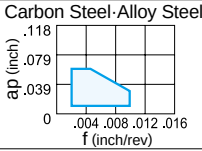
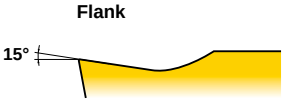
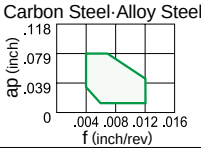
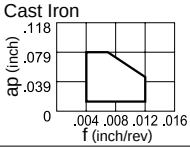
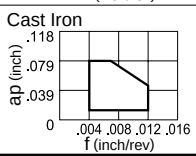
NEGATIVE INSERTS WITHOUT HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M Class	**M1** 	**Medium cutting of carbon steel and alloy steel** Single sided chipbreaker. Can be used for copying. An angled chipbreaker for controlling chip flow. (M1)	Carbon Steel·Alloy Steel  Flank 
For Cast Iron	M Class	**Flat Top** 	**Heavy cutting of cast iron** Double sided flat insert. Most effective for unstable machining due to high edge strength and stable insert clamping.	Cast Iron  
For Cast Iron	G Class	**Flat Top** 	**For cast iron** Double sided flat insert. Most effective for unstable machining due to high edge strength and stable insert clamping. Use on workpieces requiring close tolerance inserts.	Cast Iron  

7° POSITIVE INSERTS WITHOUT HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
For Cast Iron	G Class	**Flat Top** 	**For cast iron** Double sided flat insert. Most effective for unstable machining due to high edge strength and stable insert clamping. Use on workpieces requiring close tolerance inserts.	Cast Iron  

11° POSITIVE INSERTS WITHOUT HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	G Class	**R/L** 	**Finishing** A parallel chipbreaker. Good chip control for low to medium feed rates.	Carbon Steel·Alloy Steel  Flank 
Light to Medium Cutting	M Class	**Standard** 	**Light to medium cutting of carbon steel, alloy steel and stainless steel** Standard, general purpose chipbreaker.	Carbon Steel·Alloy Steel  Nose  Flank 
For Cast Iron	M Class	**Flat Top** 	**Heavy cutting of cast iron** Flat top. Most effective for unstable machining due to high edge strength and stable insert clamping.	Cast Iron  
For Cast Iron	G Class	**Flat Top** 	**For cast iron** Flat top. Most effective for unstable machining due to high edge strength and stable insert clamping. Use on workpieces requiring close tolerance inserts.	Cast Iron  

	Square 90°	Triangular 60°	Parallelogram 55°
			KNUX_M1  A133
	SNMN  A134	TNMN  A135	
	SNG  A134	TNG  A135	

	Triangular 60°
	TCG  A176

	Square 90°	Triangular 60°
	SPGR_R  A175	TPGR_R/L  A177
	SPMR  A175	TPMR  A177
	SPMN  A175	TPMN  A177
	SPG  A175	TPG  A178

SPECIAL PURPOSE INSERTS

Application	Tolerance	Tool Holder Type	Inserts
Special	G Class	TL Type	RTG  A174

RECOMMENDED CUTTING CONDITIONS

NEGATIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P									
Mild Steel (AISI ASTM A283, AISI 1010)	≤180HB	●	F	1	FY	VP25N	935–1460	.004–.010	.008–.032
		●	F	2	FS	NX2525	885–1260	.004–.010	.008–.028
		●	L	1	SY	VP25N	850–1330	.007–.013	.020–.048
		◐	F	1	FY	MP3025	900–1380	.004–.010	.008–.032
		◐	F	2	FY	NX3035	850–1215	.004–.010	.008–.032
		◐	F	3	FS	NX2525	885–1260	.004–.010	.008–.028
		◐	L	1	SY	MP3025	820–1260	.007–.013	.020–.048
		◐	L	2	SY	NX3035	770–1100	.007–.013	.020–.048
		✣	F	1	FY	UE6020	935–1510	.004–.010	.008–.032
		✣	F	2	FS	UE6020	935–1510	.004–.010	.008–.028
		✣	L	1	SY	UE6020	850–1380	.007–.013	.020–.048
Carbon Steel • Alloy Steel (AISI 1045, AISI 4140)	180 | 280HB	●	F	1	FH	AP25N	705–1115	.004–.008	.008–.040
		●	F	2	FH	NX2525	670–970	.004–.008	.008–.040
		●	F	3	R/L-F	MP3025	690–1065	.002–.006	.004–.020
		●	F	4	PK	NX2525	640–920	.004–.012	.008–.040
		●	L	1	LP	UE6105	720–1330	.004–.016	.012–.079
		●	L	2	SH	UE6105	720–1330	.004–.016	.012–.079
		●	L	3	LP	MP3025	640–970	.004–.016	.012–.079
		●	L	4	SH	AP25N	655–1030	.004–.016	.012–.079
		●	L	5	SH	NX2525	620–885	.004–.016	.012–.079
		●	L	6	SA	UE6105	720–1330	.004–.016	.012–.079
		●	L	7	SW	UE6105	720–1330	.004–.020	.012–.099
		●	L	8	SW	MP3025	640–970	.004–.020	.012–.099
		●	L	9	SW	NX2525	620–885	.004–.020	.012–.099
		●	L	10	R/L-K	MP3025	640–970	.004–.008	.012–.048
		●	M	1	MP	UE6105	655–1215	.007–.020	.012–.158
		●	M	2	MP	MP3025	575–885	.007–.020	.012–.158
		●	M	3	MA	UE6105	655–1215	.008–.020	.012–.158
		●	M	4	MH	UE6105	655–1215	.008–.022	.040–.158
		●	M	5	Std	UE6105	655–1215	.010–.024	.060–.197
		●	M	6	Std	MP3025	575–885	.010–.024	.060–.197
		●	M	7	Std	NX2525	560–805	.010–.024	.060–.197
		●	M	8	Std	UTi20T	280–410	.010–.024	.060–.197
		●	M	9	MW	UE6105	655–1215	.008–.024	.036–.158
		●	M	10	R/L	MP3025	575–885	.006–.013	.016–.079
		●	R	1	RP	UE6105	620–1150	.010–.024	.060–.237
		●	R	2	GH	UE6105	620–1150	.010–.024	.060–.237
		●	H	1	HX	UE6110	525–900	.020–.050	.119–.434
		●	H	2	HV	UE6110	440–740	.028–.052	.158–.473
		◐	F	1	FH	MP3025	690–1065	.004–.008	.008–.040
		◐	F	2	FH	NX3035	655–935	.004–.008	.008–.040
		◐	F	3	FH	UE6110	755–1280	.004–.008	.008–.040
		◐	L	1	LP	MC6015	690–1165	.004–.016	.012–.079
		◐	L	2	LP	UE6110	690–1165	.004–.016	.012–.079
		◐	L	3	SH	UE6110	690–1165	.004–.016	.012–.079
		◐	L	4	SA	UE6110	690–1165	.004–.016	.012–.079
		◐	L	5	LP	MP3025	640–970	.004–.016	.012–.079

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P									
Carbon Steel • Alloy Steel (AISI 1045, AISI 4140)	180 | 280HB		**L**	6	**SH**	**NX3035**	605–850	.004–.016	.012–.079
			L	7	**SA**	**NX3035**	605–850	.004–.016	.012–.079
			L	8	**SW**	**UE6110**	690–1165	.004–.020	.012–.099
			L	9	**SW**	**NX3035**	605–850	.004–.020	.012–.099
			M	1	**MP**	**MC6015**	620–1065	.007–.020	.012–.158
			M	2	**MP**	**UE6110**	620–1065	.007–.020	.012–.158
			M	3	**MA**	**MC6015**	620–1065	.008–.020	.012–.158
			M	4	**MA**	**UE6110**	620–1065	.008–.020	.012–.158
			M	5	**MA**	**NX3035**	540–770	.008–.020	.012–.158
			M	6	**MH**	**MC6015**	620–1065	.008–.022	.040–.158
			M	7	**MH**	**UE6110**	620–1065	.008–.022	.040–.158
			M	8	**Std**	**UE6110**	620–1065	.010–.024	.060–.197
			M	9	**Std**	**NX3035**	540–770	.010–.024	.060–.197
			M	10	**MW**	**MC6015**	620–1065	.008–.024	.036–.158
			M	11	**MW**	**UE6110**	620–1065	.008–.024	.036–.158
			R	1	**RP**	**MC6015**	590–1015	.010–.024	.060–.237
			R	2	**RP**	**UE6110**	590–1015	.010–.024	.060–.237
			R	3	**GH**	**UE6110**	590–1015	.010–.024	.060–.237
			H	1	**HX**	**UE6020**	510–820	.020–.050	.119–.434
			H	2	**HV**	**UE6020**	410–670	.028–.052	.158–.473
			H	3	**HZ**	**UE6110**	525–900	.016–.048	.079–.394
			F	1	**FH**	**UE6110**	755–1280	.004–.008	.008–.040
			F	2	**FH**	**UE6020**	705–1165	.004–.008	.008–.040
			L	1	**LP**	**MC6025**	690–1115	.004–.016	.012–.079
			L	2	**SH**	**UE6020**	655–1065	.004–.016	.012–.079
			L	3	**SA**	**UE6020**	655–1065	.004–.016	.012–.079
			M	1	**MP**	**MC6025**	620–1015	.007–.020	.012–.158
			M	2	**MA**	**MC6025**	620–1015	.008–.020	.012–.158
			M	3	**Std**	**MC6025**	620–1015	.010–.024	.060–.197
			M	4	**MP**	**UE6020**	590–970	.007–.020	.012–.158
			M	5	**MA**	**UE6020**	590–970	.008–.020	.012–.158
			M	6	**MA**	**UE6035**	560–770	.008–.020	.012–.158
			M	7	**MH**	**UE6020**	590–970	.008–.022	.040–.158
			M	8	**MH**	**UE6035**	560–770	.008–.022	.040–.158
			M	9	**Std**	**UE6020**	590–970	.010–.024	.060–.197
			M	10	**Std**	**UE6035**	560–770	.010–.024	.060–.197
			M	11	**MW**	**MC6025**	620–1015	.008–.024	.036–.158
			R	1	**RP**	**MC6025**	590–970	.010–.024	.060–.237
			R	2	**GH**	**UE6020**	560–920	.010–.024	.060–.237
			H	1	**HX**	**UH6400**	440–640	.020–.050	.119–.434
			H	2	**HV**	**UH6400**	360–525	.028–.052	.158–.473
			H	3	**HZ**	**UH6400**	440–640	.016–.048	.079–.394
			H	4	**HZ**	**UE6020**	510–820	.016–.048	.079–.394

RECOMMENDED CUTTING CONDITIONS

NEGATIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Austenitic Stainless Steel (AISI 304, AISI 306)	≤200HB	●	L	1	LM	MC7015	590–935	.004–.012	.012–.079
		●	L	2	SH	US735	310–605	.004–.016	.012–.079
		●	L	3	SH	NX2525	210–440	.004–.016	.012–.079
		●	L	4	SW	US7020	345–885	.004–.020	.012–.099
		●	M	1	MM	MC7015	525–835	.006–.018	.028–.197
		●	M	2	GM	MC7015	525–835	.007–.020	.020–.158
		●	M	3	MS	US7020	310–805	.007–.020	.020–.158
		●	M	4	MA	US7020	310–805	.008–.020	.012–.158
		●	M	5	MH	US7020	310–805	.008–.022	.040–.158
		●	M	6	MW	US7020	310–805	.008–.024	.036–.158
		●	R	1	RM	MC7015	510–805	.010–.022	.060–.237
		●	R	2	GH	US7020	295–770	.010–.024	.060–.237
		◐	L	1	LM	MC7025	525–705	.004–.012	.012–.079
		◐	L	2	SH	US735	310–605	.004–.016	.012–.079
		◐	M	1	MM	MC7025	475–640	.006–.018	.028–.197
		◐	M	2	GM	MC7025	475–640	.007–.020	.020–.158
		◐	M	3	MA	MC7025	475–640	.008–.020	.012–.158
		◐	M	4	MS	US735	280–540	.007–.020	.020–.158
		◐	M	5	MA	US735	280–540	.008–.020	.012–.158
		◐	R	1	RM	MC7025	460–605	.010–.022	.060–.237
		◐	R	2	GH	US735	280–525	.010–.024	.060–.237
		✣	L	1	LM	MP7035	310–510	.004–.012	.012–.079
		✣	L	2	SH	US735	310–605	.004–.016	.012–.079
		✣	M	1	MM	MP7035	280–460	.006–.018	.028–.197
		✣	M	2	GM	MP7035	280–460	.007–.020	.020–.158
		✣	M	3	MA	MP7035	280–460	.008–.020	.012–.158
		✣	M	4	MS	US735	280–540	.007–.020	.020–.158
		✣	M	5	MS	VP15TF	245–425	.007–.020	.020–.158
		✣	M	6	MS	UP20M	310–475	.007–.020	.020–.158
		✣	M	7	MS	UTi20T	245–360	.007–.020	.020–.158
		✣	M	8	MA	VP15TF	245–425	.008–.020	.012–.158
		✣	M	9	Std	VP15TF	245–425	.010–.024	.060–.197
		✣	R	1	RM	MP7035	280–440	.010–.022	.060–.237
		✣	R	2	GH	US735	280–525	.010–.024	.060–.237
Austenitic Stainless Steel (AISI 304LN, AISI 316LN)	>200HB	●	L	1	LM	MC7015	490–785	.004–.012	.012–.079
		●	L	2	SH	US735	260–510	.004–.016	.012–.079
		●	L	3	SH	NX2525	180–375	.004–.016	.012–.079
		●	L	4	SW	US7020	295–755	.004–.020	.012–.099
		●	M	1	MM	MC7015	440–705	.006–.018	.028–.197
		●	M	2	GM	MC7015	440–705	.007–.020	.020–.158
		●	M	3	MS	US7020	260–670	.007–.020	.020–.158
		●	M	4	MA	US7020	260–670	.008–.020	.012–.158
		●	M	5	MH	US7020	260–670	.008–.022	.040–.158
		●	M	6	MW	US7020	260–670	.008–.024	.036–.158
		●	R	1	RM	MC7015	425–670	.010–.022	.060–.237
		●	R	2	GH	US7020	245–640	.010–.024	.060–.237
		◐	L	1	LM	MC7025	440–590	.004–.012	.012–.079

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Austenitic Stainless Steel (AISI 304LN, AISI 316LN)	>200HB		**L**	2	**SH**	**US735**	260–510	.004–.016	.012–.079
			M	1	**MM**	**MC7025**	410–540	.006–.018	.028–.197
			M	2	**GM**	**MC7025**	410–540	.007–.020	.020–.158
			M	3	**MA**	**MC7025**	410–540	.008–.020	.012–.158
			M	4	**MS**	**US735**	245–460	.007–.020	.020–.158
			M	5	**MA**	**US735**	245–460	.008–.020	.012–.158
			R	1	**RM**	**MC7025**	375–510	.010–.022	.060–.237
			R	2	**GH**	**US735**	230–440	.010–.024	.060–.237
			L	1	**LM**	**MP7035**	260–425	.004–.012	.012–.079
			L	2	**SH**	**US735**	260–510	.004–.016	.012–.079
			M	1	**MM**	**MP7035**	245–395	.006–.018	.028–.197
			M	2	**GM**	**MP7035**	245–395	.007–.020	.020–.158
			M	3	**MA**	**MP7035**	245–395	.008–.020	.012–.158
			M	4	**MS**	**US735**	245–460	.007–.020	.020–.158
			M	5	**MS**	**VP15TF**	210–360	.007–.020	.020–.158
			M	6	**MS**	**UP20M**	260–410	.007–.020	.020–.158
			M	7	**MS**	**UTi20T**	210–310	.007–.020	.020–.158
			M	8	**MA**	**VP15TF**	210–360	.008–.020	.012–.158
			M	9	**Std**	**VP15TF**	210–360	.010–.024	.060–.197
			R	1	**RM**	**MP7035**	230–375	.010–.022	.060–.237
			R	2	**GH**	**US735**	230–440	.010–.024	.060–.237
Two-phase Stainless Steel (DUPLEX)	≤280HB		**L**	1	**LM**	**MC7015**	395–640	.004–.012	.012–.079
			L	2	**SH**	**US735**	210–410	.004–.016	.012–.079
			L	3	**SH**	**NX2525**	150–295	.004–.016	.012–.079
			L	4	**SW**	**US7020**	245–605	.004–.020	.012–.099
			M	1	**MM**	**MC7015**	360–575	.006–.018	.028–.197
			M	2	**GM**	**MC7015**	360–575	.007–.020	.020–.158
			M	3	**MS**	**US7020**	210–560	.007–.020	.020–.158
			M	4	**MA**	**US7020**	210–560	.008–.020	.012–.158
			M	5	**MH**	**US7020**	210–560	.008–.022	.040–.158
			M	6	**MW**	**US7020**	210–560	.008–.024	.036–.158
			R	1	**RM**	**MC7015**	345–540	.010–.022	.060–.237
			R	2	**GH**	**US7020**	195–525	.010–.024	.060–.237
			L	1	**LM**	**MC7025**	360–490	.004–.012	.012–.079
			L	2	**SH**	**US735**	210–410	.004–.016	.012–.079
			M	1	**MM**	**MC7025**	330–440	.006–.018	.028–.197
			M	2	**GM**	**MC7025**	330–440	.007–.020	.020–.158
			M	3	**MA**	**MC7025**	330–440	.008–.020	.012–.158
			M	4	**MS**	**US735**	195–375	.007–.020	.020–.158
			M	5	**MA**	**US735**	195–375	.008–.020	.012–.158
			R	1	**RM**	**MC7025**	310–410	.010–.022	.060–.237
			R	2	**GH**	**US735**	180–360	.010–.024	.060–.237
			L	1	**LM**	**MP7035**	210–345	.004–.012	.012–.079
			L	2	**SH**	**US735**	210–410	.004–.016	.012–.079
			M	1	**MM**	**MP7035**	195–310	.006–.018	.028–.197
			M	2	**GM**	**MP7035**	195–310	.007–.020	.020–.158
			M	3	**MA**	**MP7035**	195–310	.008–.020	.012–.158

RECOMMENDED CUTTING CONDITIONS

NEGATIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Two-phase Stainless Steel (DUPLEX)	≤280HB	✣	M	4	MS	US735	195–375	.007–.020	.020–.158
		✣	M	5	MS	VP15TF	165–295	.007–.020	.020–.158
		✣	M	6	MS	UP20M	210–330	.007–.020	.020–.158
		✣	M	7	MS	UTi20T	165–245	.007–.020	.020–.158
		✣	M	8	MA	VP15TF	165–295	.008–.020	.012–.158
		✣	M	9	Std	VP15TF	165–295	.010–.024	.060–.197
		✣	R	1	RM	MP7035	180–295	.010–.022	.060–.237
		✣	R	2	GH	US735	180–360	.010–.024	.060–.237
Ferritic and Martensitic Stainless Steel (AISI 410, AISI 430)	≤200HB	●	L	1	LM	MC7015	590–935	.004–.012	.012–.079
		●	L	2	SH	US735	310–605	.004–.016	.012–.079
		●	L	3	SH	NX2525	210–440	.004–.016	.012–.079
		●	L	4	SW	US7020	345–885	.004–.020	.012–.099
		●	M	1	MM	MC7015	525–835	.006–.018	.028–.197
		●	M	2	GM	MC7015	525–835	.007–.020	.020–.158
		●	M	3	MS	US7020	310–805	.007–.020	.020–.158
		●	M	4	MA	US7020	310–805	.008–.020	.012–.158
		●	M	5	MH	US7020	310–805	.008–.022	.040–.158
		●	M	6	MW	US7020	310–805	.008–.024	.036–.158
		●	R	1	RM	MC7015	510–805	.010–.022	.060–.237
		●	R	2	GH	US7020	295–770	.010–.024	.060–.237
		◐	L	1	LM	MC7025	525–705	.004–.012	.012–.079
		◐	L	2	SH	US735	310–605	.004–.016	.012–.079
		◐	M	1	MM	MC7025	475–640	.006–.018	.028–.197
		◐	M	2	GM	MC7025	475–640	.007–.020	.020–.158
		◐	M	3	MA	MC7025	475–640	.008–.020	.012–.158
		◐	M	4	MS	US735	280–540	.007–.020	.020–.158
		◐	M	5	MA	US735	280–540	.008–.020	.012–.158
		◐	R	1	RM	MC7025	460–605	.010–.022	.060–.237
		◐	R	2	GH	US735	280–525	.010–.024	.060–.237
		✣	L	1	LM	MP7035	310–510	.004–.012	.012–.079
		✣	L	2	SH	US735	310–605	.004–.016	.012–.079
		✣	M	1	MM	MP7035	280–460	.006–.018	.028–.197
		✣	M	2	GM	MP7035	280–460	.007–.020	.020–.158
		✣	M	3	MA	MP7035	280–460	.008–.020	.012–.158
		✣	M	4	MS	US735	280–540	.007–.020	.020–.158
		✣	M	5	MS	VP15TF	245–425	.007–.020	.020–.158
		✣	M	6	MS	UP20M	310–475	.007–.020	.020–.158
		✣	M	7	MS	UTi20T	245–360	.007–.020	.020–.158
		✣	M	8	MA	VP15TF	245–425	.008–.020	.012–.158
		✣	M	9	Std	VP15TF	245–425	.010–.024	.060–.197
		✣	R	1	RM	MP7035	280–440	.010–.022	.060–.237
		✣	R	2	GH	US735	280–525	.010–.024	.060–.237
Ferritic and Martensitic Stainless Steel (AISI 431)	>200HB	●	L	1	LM	MC7015	490–785	.004–.012	.012–.079
		●	L	2	SH	US735	260–510	.004–.016	.012–.079
		●	L	3	SH	NX2525	180–375	.004–.016	.012–.079
		●	L	4	SW	US7020	295–755	.004–.020	.012–.099
		●	M	1	MM	MC7015	440–705	.006–.018	.028–.197

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Ferritic and Martensitic Stainless Steel (AISI 431)	>200HB	●	M	2	GM	MC7015	440–705	.007–.020	.020–.158
		●	M	3	MS	US7020	260–670	.007–.020	.020–.158
		●	M	4	MA	US7020	260–670	.008–.020	.012–.158
		●	M	5	MH	US7020	260–670	.008–.022	.040–.158
		●	M	6	MW	US7020	260–670	.008–.024	.036–.158
		●	R	1	RM	MC7015	425–670	.010–.022	.060–.237
		●	R	2	GH	US7020	245–640	.010–.024	.060–.237
		●	L	1	LM	MC7025	440–590	.004–.012	.012–.079
		◐	L	2	SH	US735	260–510	.004–.016	.012–.079
		◐	M	1	MM	MC7025	410–540	.006–.018	.028–.197
		◐	M	2	MS	MC7025	410–540	.007–.020	.020–.158
		◐	M	3	MA	MC7025	410–540	.008–.020	.012–.158
		◐	M	4	MS	US735	245–460	.007–.020	.020–.158
		◐	M	5	MA	US735	245–460	.008–.020	.012–.158
		◐	R	1	RM	MC7025	375–510	.010–.022	.060–.237
		◐	R	2	GH	US735	230–440	.010–.024	.060–.237
		✣	L	1	LM	MP7035	260–425	.004–.012	.012–.079
		✣	L	2	SH	US735	260–510	.004–.016	.012–.079
		✣	M	1	MM	MP7035	245–395	.006–.018	.028–.197
		✣	M	2	GM	MP7035	245–395	.007–.020	.020–.158
		✣	M	3	MA	MP7035	245–395	.008–.020	.012–.158
		✣	M	4	MS	US735	245–460	.007–.020	.020–.158
		✣	M	5	MS	VP15TF	210–360	.007–.020	.020–.158
		✣	M	6	MS	UP20M	260–410	.007–.020	.020–.158
		✣	M	7	MS	UTi20T	210–310	.007–.020	.020–.158
		✣	M	8	MA	VP15TF	210–360	.008–.020	.012–.158
		✣	M	9	Std	VP15TF	210–360	.010–.024	.060–.197
		✣	R	1	RM	MP7035	230–375	.010–.022	.060–.237
		✣	R	2	GH	US735	230–440	.010–.024	.060–.237
Hardened Stainless Steel	<450HB	●	L	1	LM	MC7015	330–525	.004–.012	.012–.079
		●	L	2	SH	US735	180–345	.004–.016	.012–.079
		●	L	3	SH	NX2525	115–245	.004–.016	.012–.079
		●	L	4	SW	US7020	195–510	.004–.020	.012–.099
		●	M	1	MM	MC7015	295–475	.006–.018	.028–.197
		●	M	2	GM	MC7015	295–475	.007–.020	.020–.158
		●	M	3	MS	US7020	180–460	.007–.020	.020–.158
		●	M	4	MA	US7020	180–460	.008–.020	.012–.158
		●	M	5	MH	US7020	180–460	.008–.022	.040–.158
		●	M	6	MW	US7020	180–460	.008–.024	.036–.158
		●	R	1	RM	MC7015	280–440	.010–.022	.060–.237
		●	R	2	GH	US7020	165–425	.010–.024	.060–.237
		◐	L	1	LM	MC7025	295–395	.004–.012	.012–.079
		◐	L	2	SH	US735	180–345	.004–.016	.012–.079
		◐	M	1	MM	MC7025	260–360	.006–.018	.028–.197
		◐	M	2	GM	MC7025	260–360	.007–.020	.020–.158
		◐	M	3	MA	MC7025	260–360	.008–.020	.012–.158
		◐	M	4	MS	US735	165–310	.007–.020	.020–.158

RECOMMENDED CUTTING CONDITIONS

NEGATIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Hardened Stainless Steel	<450HB	◐	**M**	5	**MA**	**US735**	165–310	.008–.020	.012–.158
		◐	**R**	1	**RM**	**MC7025**	260–345	.010–.022	.060–.237
		◐	**R**	2	**GH**	**US735**	150–295	.010–.024	.060–.237
		✣	**L**	1	**LM**	**MP7035**	180–280	.004–.012	.012–.079
		✣	**L**	2	**SH**	**US735**	180–345	.004–.016	.012–.079
		✣	**M**	1	**MM**	**MP7035**	165–260	.006–.018	.028–.197
		✣	**M**	2	**GM**	**MP7035**	165–260	.007–.020	.020–.158
		✣	**M**	3	**MA**	**MP7035**	165–260	.008–.020	.012–.158
		✣	**M**	4	**MS**	**US735**	165–310	.007–.020	.020–.158
		✣	**M**	5	**MS**	**VP15TF**	150–245	.007–.020	.020–.158
		✣	**M**	6	**MS**	**UP20M**	180–260	.007–.020	.020–.158
		✣	**M**	7	**MS**	**UTi20T**	150–195	.007–.020	.020–.158
		✣	**M**	8	**MA**	**VP15TF**	150–245	.008–.020	.012–.158
		✣	**M**	9	**Std**	**VP15TF**	150–245	.010–.024	.060–.197
		✣	**R**	1	**RM**	**MP7035**	150–245	.010–.022	.060–.237
		✣	**R**	2	**GH**	**US735**	150–295	.010–.024	.060–.237

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
K									
Gray Cast Iron (AISI No 45 B)	≤350MPa	●	L	1	LK	MC5005	715–1100	.004–.016	.012–.079
		●	L	2	MA	MC5005	640–1000	.008–.020	.012–.158
		●	L	3	MA	UC5105	560–1030	.008–.020	.012–.158
		●	M	1	MK	MC5005	640–1000	.008–.022	.036–.158
		●	M	2	GK	MC5005	640–1000	.010–.024	.060–.197
		●	M	3	Std	UC5105	560–1030	.010–.024	.060–.197
		●	M	4	Std	NX2525	510–690	.010–.024	.060–.197
		●	M	5	MW	UC5105	560–1030	.008–.024	.036–.158
		●	R	1	RK	MC5005	600–950	.010–.024	.060–.237
		●	R	2	Flat	MC5005	600–950	.010–.024	.099–.237
		●	R	3	GH	UC5105	540–985	.010–.024	.060–.237
		●	R	4	Flat	UC5105	540–985	.008–.024	.099–.237
		●	R	5	Flat	HTi10	330–475	.008–.024	.099–.237
		●	R	6	Flat	HTi05T	360–605	.008–.024	.099–.237
		●	H	1	Flat	MC5005	600–950	.008–.024	.099–.237
		●	H	2	Flat	UC5105	540–985	.008–.024	.099–.237
		◐	L	1	LK	MC5015	625–1000	.004–.016	.012–.079
		◐	L	2	MA	MC5015	580–930	.008–.020	.012–.158
		◐	L	3	MA	UC5115	540–1000	.008–.020	.012–.158
		◐	L	4	MP	UC5115	540–1000	.007–.020	.012–.158
		◐	L	5	SW	UC5115	605–1100	.004–.020	.012–.099
		◐	M	1	MK	MC5015	580–930	.008–.022	.036–.158
		◐	M	2	GK	MC5015	580–930	.010–.024	.060–.197
		◐	M	3	Std	UC5115	540–1000	.010–.024	.060–.197
		◐	M	4	Std	HTi10	345–490	.010–.024	.060–.197
		◐	M	5	MH	UC5115	540–1000	.008–.022	.040–.158
		◐	M	6	MW	UC5115	540–1000	.008–.024	.036–.158
		◐	R	1	RK	MC5015	540–860	.010–.024	.060–.237
		◐	R	2	Flat	MC5015	540–860	.008–.024	.099–.237
		◐	R	3	GH	UC5115	525–950	.010–.024	.060–.237
		◐	R	4	Flat	UC5115	525–950	.008–.024	.099–.237
		◐	H	1	Flat	MC5015	540–860	.008–.024	.099–.237
		◐	H	2	Flat	UC5115	525–950	.008–.024	.099–.237
		✣	L	1	LK	MC5015	625–1000	.004–.016	.012–.079
		✣	L	2	MA	MC5015	580–930	.008–.020	.012–.158
		✣	L	3	MA	UC5115	540–1000	.008–.020	.012–.158
		✣	M	1	MK	MC5015	580–930	.008–.022	.060–.158
		✣	M	2	GK	MC5015	580–930	.010–.024	.060–.197
		✣	M	3	Std	UC5115	540–1000	.010–.024	.060–.197
		✣	M	4	Std	UTi20T	280–395	.010–.024	.060–.197
		✣	R	1	RK	MC5015	540–860	.010–.024	.060–.237
		✣	R	2	Flat	MC5015	540–860	.008–.024	.099–.237
		✣	R	3	GH	UC5115	525–950	.010–.024	.060–.237
		✣	R	4	Flat	UC5115	525–950	.008–.024	.099–.237
		✣	R	5	Flat	UTi20T	260–375	.008–.024	.099–.237
		✣	H	1	Flat	MC5015	540–860	.008–.024	.099–.237
		✣	H	2	Flat	UC5115	525–950	.008–.024	.099–.237

RECOMMENDED CUTTING CONDITIONS

NEGATIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
K									
Ductile Cast Iron	≤450MPa	●	L	1	LK	MC5005	670–1080	.004–.016	.012–.079
		●	L	2	MA	MC5005	640–1000	.008–.020	.012–.158
		●	L	3	MA	UC5105	525–970	.008–.020	.012–.158
		●	M	1	MK	MC5005	640–1000	.008–.022	.036–.158
		●	M	2	GK	MC5005	640–1000	.010–.024	.060–.197
		●	M	3	Std	UC5105	525–970	.010–.024	.060–.197
		●	M	4	Std	NX2525	475–655	.010–.024	.060–.197
		●	R	1	RK	MC5005	600–950	.010–.024	.060–.237
		●	R	2	Flat	MC5005	600–950	.008–.024	.099–.237
		●	R	3	GH	UC5105	510–920	.010–.024	.060–.237
		●	R	4	Flat	UC5105	510–920	.008–.024	.099–.237
		●	R	5	Flat	HTi10	310–440	.008–.024	.099–.237
		●	R	6	Flat	HTi05T	345–575	.008–.024	.099–.237
		●	H	1	Flat	MC5005	600–950	.008–.024	.099–.237
		●	H	2	Flat	UC5105	510–920	.008–.024	.099–.237
		◐	L	1	LK	MC5015	625–1000	.004–.016	.012–.079
		◐	L	2	MA	MC5015	580–930	.008–.020	.012–.158
		◐	L	3	MA	UC5115	510–935	.008–.020	.012–.158
		◐	L	4	MP	UC5115	510–935	.007–.020	.012–.158
		◐	L	5	SW	UC5115	575–1030	.004–.020	.012–.099
		◐	M	1	MK	MC5015	580–930	.008–.022	.036–.158
		◐	M	2	GK	MC5015	580–930	.010–.024	.060–.197
		◐	M	3	Std	UC5115	510–935	.010–.024	.060–.197
		◐	M	4	Std	HTi10	330–460	.010–.024	.060–.197
		◐	R	1	RK	MC5015	540–860	.010–.024	.060–.237
		◐	R	2	Flat	MC5015	540–860	.008–.024	.099–.237
		◐	R	3	GH	UC5115	490–900	.010–.024	.060–.237
		◐	R	4	Flat	UC5115	490–900	.008–.024	.099–.237
		◐	H	1	Flat	MC5015	540–860	.008–.024	.099–.237
		◐	H	2	Flat	UC5115	490–900	.008–.024	.099–.237
		✣	L	1	LK	MC5015	625–1000	.004–.016	.012–.079
		✣	L	2	MA	MC5015	580–930	.008–.020	.012–.158
		✣	L	3	MA	UC5115	510–935	.008–.020	.012–.158
		✣	M	1	MK	MC5015	580–930	.008–.022	.060–.158
		✣	M	2	GK	MC5015	580–930	.010–.024	.060–.197
		✣	M	3	Std	UC5115	510–935	.010–.024	.060–.197
		✣	M	4	Std	UTi20T	260–375	.010–.024	.060–.197
		✣	R	1	RK	MC5015	540–860	.010–.024	.060–.237
		✣	R	2	Flat	MC5015	540–860	.008–.024	.099–.237
		✣	R	3	GH	UC5115	490–900	.010–.024	.060–.237
		✣	R	4	Flat	UC5115	490–900	.008–.024	.099–.237
		✣	R	5	Flat	UTi20T	245–360	.008–.024	.099–.237
		✣	H	1	Flat	MC5015	540–860	.008–.024	.099–.237
		✣	H	2	Flat	UC5115	490–900	.008–.024	.099–.237
	≤800MPa	●	L	1	LK	MC5005	600–950	.004–.016	.012–.079
		●	L	2	MA	MC5005	640–1000	.008–.020	.012–.158
		●	L	3	MA	UC5105	475–870	.008–.020	.012–.158

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
K									
Ductile Cast Iron	≤800MPa	●	**M**	1	**MK**	**MC5005**	640—1000	.008—.022	.036—.158
		●	**M**	2	**GK**	**MC5005**	640—1000	.010—.024	.060—.197
		●	**M**	3	**Std**	**UC5105**	475—870	.010—.024	.060—.197
		●	**M**	4	**Std**	**NX2525**	425—575	.010—.024	.060—.197
		●	**R**	1	**RK**	**MC5005**	600—950	.010—.024	.060—.237
		●	**R**	2	**Flat**	**MC5005**	600—950	.008—.024	.099—.237
		●	**R**	3	**GH**	**UC5105**	440—820	.010—.024	.060—.237
		●	**R**	4	**Flat**	**UC5105**	440—820	.008—.024	.099—.237
		●	**R**	5	**Flat**	**HTi10**	280—395	.008—.024	.099—.237
		●	**R**	6	**Flat**	**HTi05T**	295—510	.008—.024	.099—.237
		●	**H**	1	**Flat**	**MC5005**	600—950	.008—.024	.099—.237
		●	**H**	2	**Flat**	**UC5105**	440—820	.008—.024	.099—.237
		◐	**L**	1	**LK**	**MC5015**	625—1000	.004—.016	.012—.079
		◐	**L**	2	**MA**	**MC5015**	580—930	.008—.020	.012—.158
		◐	**L**	3	**MA**	**UC5115**	460—835	.008—.020	.012—.158
		◐	**L**	4	**MP**	**UC5115**	460—835	.007—.020	.012—.158
		◐	**L**	5	**SW**	**UC5115**	510—920	.004—.020	.012—.099
		◐	**M**	1	**MK**	**MC5015**	580—930	.008—.022	.036—.158
		◐	**M**	2	**GK**	**MC5015**	580—930	.010—.024	.060—.197
		◐	**M**	3	**Std**	**UC5115**	460—835	.010—.024	.060—.197
		◐	**M**	4	**Std**	**HTi10**	280—410	.010—.024	.060—.197
		◐	**R**	1	**RK**	**MC5015**	540—860	.010—.024	.060—.237
		◐	**R**	2	**Flat**	**MC5015**	540—860	.008—.024	.099—.237
		◐	**R**	3	**GH**	**UC5115**	425—785	.010—.024	.060—.237
		◐	**R**	4	**Flat**	**UC5115**	425—785	.008—.024	.099—.237
		◐	**H**	1	**Flat**	**MC5015**	540—860	.008—.024	.099—.237
		◐	**H**	2	**Flat**	**UC5115**	425—785	.008—.024	.099—.237
		✣	**L**	1	**LK**	**MC5015**	625—1000	.004—.016	.012—.079
		✣	**L**	2	**MA**	**MC5015**	580—930	.008—.020	.012—.158
		✣	**L**	3	**MA**	**UC5115**	460—835	.008—.020	.012—.158
		✣	**M**	1	**MK**	**MC5015**	580—930	.008—.022	.036—.158
		✣	**M**	2	**GK**	**MC5015**	580—930	.010—.024	.060—.197
		✣	**M**	3	**Std**	**UC5115**	460—835	.010—.024	.060—.197
		✣	**M**	4	**Std**	**UTi20T**	230—330	.010—.024	.060—.197
		✣	**R**	1	**RK**	**MC5015**	540—860	.010—.024	.060—.237
		✣	**R**	2	**Flat**	**MC5015**	540—860	.008—.024	.099—.237
		✣	**R**	3	**GH**	**UC5115**	425—785	.010—.024	.060—.237
		✣	**R**	4	**Flat**	**UC5115**	425—785	.008—.024	.099—.237
		✣	**R**	5	**Flat**	**UTi20T**	210—310	.008—.024	.099—.237
		✣	**H**	1	**Flat**	**MC5015**	540—860	.008—.024	.099—.237
		✣	**H**	2	**Flat**	**UC5115**	425—785	.008—.024	.099—.237

RECOMMENDED CUTTING CONDITIONS

NEGATIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
S									
Titanium Alloy (Ti-6Al-4V)	–	●	F	1	FJ	RT9010	150–310	.003–.008	.004–.040
		●	L	1	LS	MT9015	115–260	.004–.010	.008–.030
		●	L	2	MJ(M)	RT9010	130–260	.003–.010	.016–.060
		●	M	1	MS	MT9015	130–260	.004–.010	.020–.158
		●	M	2	MS	RT9010	130–260	.004–.010	.020–.158
		●	R	1	RS	MT9015	100–220	.008–.013	.036–.158
		●	R	2	GJ	RT9010	115–245	.007–.014	.040–.119
		◐	F	1	FJ	RT9010	150–310	.003–.008	.004–.040
		◐	L	1	LS	MT9015	115–260	.004–.010	.008–.030
		◐	L	2	MJ(M)	RT9010	130–260	.003–.010	.016–.060
		◐	L	3	MJ(G)	RT9010	130–260	.003–.010	.016–.060
		◐	M	1	MS	MT9015	130–260	.004–.010	.020–.158
		◐	M	2	MS	RT9010	130–260	.004–.010	.020–.158
		◐	R	1	RS	MT9015	100–220	.008–.013	.036–.158
		◐	R	2	GJ	RT9010	115–245	.007–.014	.040–.119
		✣	F	1	FJ	RT9010	150–310	.003–.008	.004–.040
		✣	L	1	MJ(M)	RT9010	130–260	.003–.010	.016–.060
		✣	L	2	MJ(G)	RT9010	130–260	.003–.010	.016–.060
		✣	M	1	MS	RT9010	130–260	.004–.010	.020–.158
		✣	R	1	GJ	RT9010	115–245	.007–.014	.040–.119
S									
Heat Resistant Alloy (Inconel718)	–	●	F	1	FJ	VP10RT	100–195	.003–.008	.004–.040
		●	L	1	LS	MP9005	90–330	.004–.010	.008–.030
		●	L	2	MJ(M)	VP05RT	100–195	.003–.010	.016–.060
		●	L	3	MJ(M)	US905	165–330	.003–.010	.016–.060
		●	L	4	MJ(G)	VP10RT	80–165	.003–.010	.016–.060
		●	M	1	MS	MP9005	90–300	.004–.010	.020–.158
		●	M	2	MS	VP05RT	100–195	.004–.010	.020–.158
		●	M	3	MS	US905	165–330	.004–.010	.020–.158
		●	R	1	RS	MP9015	60–220	.008–.013	.036–.158
		●	R	2	GJ	VP10RT	65–150	.007–.014	.040–.119
		●	R	3	GJ	US905	150–310	.007–.014	.040–.119
		◐	F	1	FJ	VP10RT	100–195	.003–.008	.004–.040
		◐	L	1	LS	MP9015	75–260	.004–.010	.008–.030
		◐	L	2	MJ(M)	VP10RT	80–165	.003–.010	.016–.060
		◐	M	1	MS	MP9015	75–245	.004–.010	.020–.158
		◐	M	2	MS	VP10RT	80–165	.004–.010	.020–.158
		◐	R	1	RS	MP9015	60–220	.008–.013	.036–.158
		◐	R	2	GJ	VP10RT	65–150	.007–.014	.040–.119
		✣	F	1	FJ	VP15TF	65–130	.003–.008	.004–.040
		✣	L	1	MJ(M)	VP15TF	65–115	.003–.010	.016–.060
		✣	L	2	MJ(G)	VP15TF	65–115	.003–.010	.016–.060
		✣	M	1	MS	VP15TF	65–115	.004–.010	.020–.158
		✣	R	1	GJ	VP15TF	50–100	.007–.014	.040–.119

CUTTING CONDITIONS : ●: Stable Cutting ◐: General Cutting ✣: Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

7° POSITIVE INSERT TYPE

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P									
Mild Steel (AISI ASTM A283, AISI 1010)	≤180HB	●	F	1	FP	NX2525	740–1050	.002–.008	.008–.036
		●	F	2	FV	NX2525	740–1050	.002–.008	.008–.036
		●	F	3	R/L-F	MP3025	755–1150	.002–.005	.004–.020
		●	L	1	LP	NX2525	740–1050	.003–.010	.008–.040
		●	L	2	Std	UE6110	670–1150	.004–.012	.012–.079
		●	L	3	MV	MP3025	620–970	.004–.012	.012–.079
		●	L	4	Std	MP3025	620–970	.004–.012	.012–.079
		●	M	1	MP	NX2525	605–870	.004–.012	.012–.079
		◐	F	1	FP	MC6015	820–1395	.002–.008	.008–.036
		◐	F	2	FP	UE6110	820–1395	.002–.008	.008–.036
		◐	F	3	FP	MP3025	755–1150	.002–.008	.008–.036
		◐	F	4	FV	MP3025	755–1150	.002–.008	.008–.036
		◐	F	5	FV	NX3035	705–1000	.002–.008	.008–.036
		◐	L	1	LP	MC6015	820–1395	.003–.010	.008–.040
		◐	L	2	LP	UE6110	820–1395	.003–.010	.008–.040
		◐	L	3	LP	MP3025	755–1150	.003–.010	.008–.040
		◐	L	4	Std	UE6110	670–1150	.004–.012	.012–.079
		◐	M	1	MP	MC6015	670–1150	.004–.012	.012–.079
		◐	M	2	MP	UE6110	670–1150	.004–.012	.012–.079
		◐	M	3	MP	MP3025	620–970	.004–.012	.012–.079
		✣	F	1	FP	MC6025	820–1330	.002–.008	.008–.036
		✣	F	2	FV	UE6020	770–1260	.002–.008	.008–.036
		✣	L	1	LP	MC6025	820–1330	.003–.010	.008–.040
		✣	L	2	Std	UE6020	640–1050	.004–.012	.012–.079
		✣	M	1	MP	MC6025	670–1100	.004–.012	.012–.079
Carbon Steel • Alloy Steel (AISI 1045, AISI 4140)	180 | 280HB	●	F	1	FP	NX2525	540–770	.002–.008	.008–.036
		●	F	2	FV	NX2525	540–770	.002–.008	.008–.036
		●	F	3	R/L-F	MP3025	560–850	.002–.005	.004–.020
		●	L	1	LP	NX2525	540–770	.003–.010	.008–.040
		●	L	2	Std	UE6110	490–850	.004–.012	.012–.079
		●	L	3	MV	MP3025	460–705	.004–.012	.012–.079
		●	L	4	Std	MP3025	460–705	.004–.012	.012–.079
		●	L	5	SV	MP3025	560–850	.003–.010	.008–.040
		●	L	6	MW	MP3025	460–705	.004–.014	.032–.099
		●	M	1	MP	NX2525	440–640	.004–.012	.012–.079
		◐	F	1	FP	MC6015	605–1015	.002–.008	.008–.036
		◐	F	2	FP	UE6110	605–1015	.002–.008	.008–.036
		◐	F	3	FP	MP3025	560–850	.002–.008	.008–.036
		◐	F	4	FV	MP3025	560–850	.002–.008	.008–.036
		◐	F	5	FV	NX3035	525–740	.002–.008	.008–.036
		◐	F	6	SW	MP3025	560–850	.003–.010	.008–.060
		◐	L	1	LP	MC6015	605–1015	.003–.010	.008–.040
		◐	L	2	LP	UE6110	605–1015	.003–.010	.008–.040
		◐	L	3	LP	MP3025	560–850	.003–.010	.008–.040
		◐	L	4	Std	UE6110	490–850	.004–.012	.012–.079
		◐	M	1	MP	MC6015	490–850	.004–.012	.012–.079
		◐	M	2	MP	UE6110	490–850	.004–.012	.012–.079

RECOMMENDED CUTTING CONDITIONS

7° POSITIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P									
Carbon Steel • Alloy Steel (AISI 1045, AISI 4140)	180 | 280HB	◔	**M**	3	**MP**	**MP3025**	460—705	.004—.012	.012—.079
		✣	**F**	1	**FP**	**MC6025**	605—970	.002—.008	.008—.036
		✣	**F**	2	**FV**	**UE6020**	575—935	.002—.008	.008—.036
		✣	**L**	1	**LP**	**MC6025**	605—970	.003—.010	.008—.040
		✣	**L**	2	**Std**	**UE6020**	475—770	.004—.012	.012—.079
		✣	**M**	1	**MP**	**MC6025**	490—805	.004—.012	.012—.079
Carbon Steel • Alloy Steel (AISI 4340)	280 | 350HB	●	**M**	1	**MP**	**NX2525**	310—460	.004—.012	.012—.079
		◔	**M**	1	**MP**	**MC6015**	360—605	.004—.012	.012—.079
		◔	**M**	2	**MP**	**UE6110**	360—605	.004—.012	.012—.079
		◔	**M**	3	**MP**	**MP3025**	330—510	.004—.012	.012—.079
		✣	**M**	1	**MP**	**MC6025**	360—575	.004—.012	.012—.079

CUTTING CONDITIONS : ● : Stable Cutting ◔ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Austenitic Stainless Steel (AISI 304, AISI 306)	≤200HB	●	F	1	FM	VP15TF	245–410	.002–.008	.008–.036
		●	F	2	Std	US735	230–440	.004–.012	.012–.079
		●	L	1	LM	MC7025	460–620	.003–.010	.008–.040
		●	L	2	Std	US735	230–440	.004–.012	.012–.079
		●	M	1	MM	MC7025	375–510	.004–.012	.012–.079
		◐	F	1	FM	VP15TF	245–410	.002–.008	.008–.036
		◐	F	2	Std	US735	230–440	.004–.012	.012–.079
		◐	L	1	LM	MC7025	460–620	.003–.010	.008–.040
		◐	L	2	Std	US735	230–440	.004–.012	.012–.079
		◐	M	1	MM	MC7025	375–510	.004–.012	.012–.079
		✣	F	1	FM	VP15TF	245–410	.002–.008	.008–.036
		✣	F	2	Std	US735	230–440	.004–.012	.012–.079
		✣	L	1	LM	MP7035	280–440	.003–.010	.008–.040
		✣	L	2	LM	VP15TF	245–410	.003–.010	.008–.040
		✣	L	3	Std	US735	230–440	.004–.012	.012–.079
		✣	M	1	MM	MP7035	230–375	.004–.012	.012–.079
		✣	M	2	MM	VP15TF	195–345	.004–.012	.012–.079
Austenitic Stainless Steel (AISI 304LN, AISI 316LN)	>200HB	●	F	1	FM	VP15TF	195–345	.002–.008	.008–.036
		●	F	2	Std	US735	195–360	.004–.012	.012–.079
		●	L	1	LM	MC7025	395–525	.003–.010	.008–.040
		●	L	2	Std	US735	195–360	.004–.012	.012–.079
		●	M	1	MM	MC7025	330–425	.004–.012	.012–.079
		◐	F	1	FM	VP15TF	195–345	.002–.008	.008–.036
		◐	F	2	Std	US735	195–360	.004–.012	.012–.079
		◐	L	1	LM	MC7025	395–525	.003–.010	.008–.040
		◐	L	2	Std	US735	195–360	.004–.012	.012–.079
		◐	M	1	MM	MC7025	330–425	.004–.012	.012–.079
		✣	F	1	FM	VP15TF	195–345	.002–.008	.008–.036
		✣	F	2	Std	US735	195–360	.004–.012	.012–.079
		✣	L	1	LM	MP7035	230–375	.003–.010	.008–.040
		✣	L	2	LM	VP15TF	195–345	.003–.010	.008–.040
		✣	L	3	Std	US735	195–360	.004–.012	.012–.079
		✣	M	1	MM	MP7035	195–310	.004–.012	.012–.079
		✣	M	2	MM	VP15TF	165–295	.004–.012	.012–.079
Two-phase Stainless Steel (DUPLEX)	≤280HB	●	F	1	FM	VP15TF	165–280	.002–.008	.008–.036
		●	F	2	Std	US735	150–295	.004–.012	.012–.079
		●	L	1	LM	MC7025	310–425	.003–.010	.008–.040
		●	L	2	Std	US735	150–295	.004–.012	.012–.079
		●	M	1	MM	MC7025	260–345	.004–.012	.012–.079
		◐	F	1	FM	VP15TF	165–280	.002–.008	.008–.036
		◐	F	2	Std	US735	150–295	.004–.012	.012–.079
		◐	L	1	LM	MC7025	310–425	.003–.010	.008–.040
		◐	L	2	Std	US735	150–295	.004–.012	.012–.079
		◐	M	1	MM	MC7025	260–345	.004–.012	.012–.079
		✣	F	1	FM	VP15TF	165–280	.002–.008	.008–.036
		✣	F	2	Std	US735	150–295	.004–.012	.012–.079
		✣	L	1	LM	MP7035	180–310	.003–.010	.008–.040

RECOMMENDED CUTTING CONDITIONS

7° POSITIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Two-phase Stainless Steel (DUPLEX)	≤280HB	✣	L	2	LM	VP15TF	165–280	.003–.010	.008–.040
		✣	L	3	Std	US735	150–295	.004–.012	.012–.079
		✣	M	1	MM	MP7035	150–245	.004–.012	.012–.079
		✣	M	2	MM	VP15TF	130–230	.004–.012	.012–.079
Ferritic and Martensitic Stainless Steel (AISI 410, AISI 430)	≤200HB	●	F	1	FM	VP15TF	245–410	.002–.008	.008–.036
		●	F	2	Std	US735	230–440	.004–.012	.012–.079
		●	L	1	LM	MC7025	460–620	.003–.010	.008–.040
		●	L	2	Std	US735	230–440	.004–.012	.012–.079
		●	M	1	MM	MC7025	375–510	.004–.012	.012–.079
		◐	F	1	FM	VP15TF	245–410	.002–.008	.008–.036
		◐	F	2	Std	US735	230–440	.004–.012	.012–.079
		◐	L	1	LM	MC7025	460–620	.003–.010	.008–.040
		◐	L	2	Std	US735	230–440	.004–.012	.012–.079
		◐	M	1	MM	MC7025	375–510	.004–.012	.012–.079
		✣	F	1	FM	VP15TF	245–410	.002–.008	.008–.036
		✣	F	2	Std	US735	230–440	.004–.012	.012–.079
		✣	L	1	LM	MP7035	280–440	.003–.010	.008–.040
		✣	L	2	LM	VP15TF	245–410	.003–.010	.008–.040
		✣	L	3	Std	US735	230–440	.004–.012	.012–.079
		✣	M	1	MM	MP7035	230–375	.004–.012	.012–.079
		✣	M	2	MM	VP15TF	195–345	.004–.012	.012–.079
Ferritic and Martensitic Stainless Steel (AISI 431)	>200HB	●	F	1	FM	VP15TF	195–345	.002–.008	.008–.036
		●	F	2	Std	US735	195–360	.004–.012	.012–.079
		●	L	1	LM	MC7025	395–525	.003–.010	.008–.040
		●	L	2	Std	US735	195–360	.004–.012	.012–.079
		●	M	1	MM	MC7025	330–425	.004–.012	.012–.079
		◐	F	1	FM	VP15TF	195–345	.002–.008	.008–.036
		◐	F	2	Std	US735	195–360	.004–.012	.012–.079
		◐	L	1	LM	MC7025	395–525	.003–.010	.008–.040
		◐	L	2	Std	US735	195–360	.004–.012	.012–.079
		◐	M	1	MM	MC7025	330–425	.004–.012	.012–.079
		✣	F	1	FM	VP15TF	195–345	.002–.008	.008–.036
		✣	F	2	Std	US735	195–360	.004–.012	.012–.079
		✣	L	1	LM	MP7035	230–375	.003–.010	.008–.040
		✣	L	2	LM	VP15TF	195–345	.003–.010	.008–.040
		✣	L	3	Std	US735	195–360	.004–.012	.012–.079
		✣	M	1	MM	MP7035	195–310	.004–.012	.012–.079
		✣	M	2	MM	VP15TF	165–295	.004–.012	.012–.079
Hardened Stainless Steel	<450HB	●	F	1	FM	VP15TF	130–230	.002–.008	.008–.036
		●	F	2	Std	US735	130–245	.004–.012	.012–.079
		●	L	1	LM	MC7025	260–345	.003–.010	.008–.040
		●	L	2	Std	US735	130–245	.004–.012	.012–.079
		●	M	1	MM	MC7025	210–295	.004–.012	.012–.079
		◐	F	1	FM	VP15TF	130–230	.002–.008	.008–.036
		◐	F	2	Std	US735	130–245	.004–.012	.012–.079
		◐	L	1	LM	MC7025	260–345	.003–.010	.008–.040
		◐	L	2	Std	US735	130–245	.004–.012	.012–.079

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Hardened Stainless Steel	<450HB		**M**	1	**MM**	**MC7025**	210–295	.004–.012	.012–.079
			F	1	**FM**	**VP15TF**	130–230	.002–.008	.008–.036
			F	2	**Std**	**US735**	130–245	.004–.012	.012–.079
			L	1	**LM**	**MP7035**	150–245	.003–.010	.008–.040
			L	2	**LM**	**VP15TF**	130–230	.003–.010	.008–.040
			L	3	**Std**	**US735**	130–245	.004–.012	.012–.079
			M	1	**MM**	**MP7035**	130–210	.004–.012	.012–.079
			M	2	**MM**	**VP15TF**	115–195	.004–.012	.012–.079

RECOMMENDED CUTTING CONDITIONS

7° POSITIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
K									
Gray Cast Iron (AISI No 45 B)	≤350MPa	●	F	1	MK	MC5005	515—820	.004—.012	.012—.079
		●	F	2	Std	UC5115	425—805	.004—.012	.012—.079
		●	L	1	MK	MC5005	515—820	.004—.012	.012—.079
		●	L	2	Std	UC5115	425—805	.004—.012	.012—.079
		●	M	1	Flat	MC5005	515—820	.004—.012	.012—.079
		●	M	2	Flat	UC5115	425—805	.004—.012	.012—.079
		◐	F	1	MK	MC5015	470—745	.004—.012	.012—.079
		◐	F	2	Std	UC5115	425—805	.004—.012	.012—.079
		◐	L	1	MK	MC5015	470—745	.004—.012	.012—.079
		◐	L	2	Std	UC5115	425—805	.004—.012	.012—.079
		◐	M	1	Flat	MC5015	470—745	.004—.012	.012—.079
		◐	M	2	Flat	UC5115	425—805	.004—.012	.012—.079
		✣	F	1	MK	MC5015	470—745	.004—.012	.012—.079
		✣	F	2	Std	UC5115	425—805	.004—.012	.012—.079
		✣	L	1	MK	MC5015	470—745	.004—.012	.012—.079
		✣	L	2	Std	UC5115	425—805	.004—.012	.012—.079
		✣	M	1	Flat	MC5015	470—745	.004—.012	.012—.079
		✣	M	2	Flat	UC5115	425—805	.004—.012	.012—.079
Ductile Cast Iron	≤450MPa	●	F	1	MK	MC5005	485—770	.004—.012	.012—.079
		●	F	2	Std	UC5115	410—755	.004—.012	.012—.079
		●	L	1	MK	MC5005	485—770	.004—.012	.012—.079
		●	L	2	Std	UC5115	410—755	.004—.012	.012—.079
		●	M	1	Flat	MC5005	485—770	.004—.012	.012—.079
		●	M	2	Flat	UC5115	410—755	.004—.012	.012—.079
		◐	F	1	MK	MC5015	440—715	.004—.012	.012—.079
		◐	F	2	Std	UC5115	410—755	.004—.012	.012—.079
		◐	L	1	MK	MC5015	440—715	.004—.012	.012—.079
		◐	L	2	Std	UC5115	410—755	.004—.012	.012—.079
		◐	M	1	Flat	MC5015	440—715	.004—.012	.012—.079
		◐	M	2	Flat	UC5115	410—755	.004—.012	.012—.079
		✣	F	1	MK	MC5015	420—680	.004—.012	.012—.079
		✣	F	2	Std	UC5115	410—755	.004—.012	.012—.079
		✣	L	1	MK	MC5015	420—680	.004—.012	.012—.079
		✣	L	2	Std	UC5115	410—755	.004—.012	.012—.079
		✣	M	1	Flat	MC5015	420—680	.004—.012	.012—.079
		✣	M	2	Flat	UC5115	410—755	.004—.012	.012—.079
	≤800MPa	●	F	1	MK	MC5005	420—680	.004—.012	.012—.079
		●	F	2	Std	UC5115	360—670	.004—.012	.012—.079
		●	L	1	MK	MC5005	420—680	.004—.012	.012—.079
		●	L	2	Std	UC5115	360—670	.004—.012	.012—.079
		●	M	1	Flat	MC5005	420—680	.004—.012	.012—.079
		●	M	2	Flat	UC5115	360—670	.004—.012	.012—.079
		◐	F	1	MK	MC5015	390—625	.004—.012	.012—.079
		◐	F	2	Std	UC5115	360—670	.004—.012	.012—.079
		◐	L	1	MK	MC5015	390—625	.004—.012	.012—.079
		◐	L	2	Std	UC5115	360—670	.004—.012	.012—.079
		◐	M	1	Flat	MC5015	390—625	.004—.012	.012—.079

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
K									
Ductile Cast Iron	≤800MPa		M	2	Flat	UC5115	360—670	.004—.012	.012—.079
			F	1	MK	MC5015	390—625	.004—.012	.012—.079
			F	2	Std	UC5115	360—670	.004—.012	.012—.079
			L	1	MK	MC5015	390—625	.004—.012	.012—.079
			L	2	Std	UC5115	360—670	.004—.012	.012—.079
			M	1	Flat	MC5015	390—625	.004—.012	.012—.079
			M	2	Flat	UC5115	360—670	.004—.012	.012—.079

RECOMMENDED CUTTING CONDITIONS

7° POSITIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
N									
Aluminium Alloy (A6061, A7075)	Si<5%	●	**F**	1	**AZ**	**HTi10**	985–2295	.004–.016	.008–.119
		◔	**F**	1	**AZ**	**HTi10**	985–2295	.004–.016	.008–.119
		✣	**F**	1	**AZ**	**HTi10**	985–2295	.004–.016	.008–.119
Aluminium Alloy (AC4B)	5%≤Si≤10%	●	**F**	1	**AZ**	**HTi10**	985–2295	.004–.016	.008–.119
		◔	**F**	1	**AZ**	**HTi10**	985–2295	.004–.016	.008–.119
		✣	**F**	1	**AZ**	**HTi10**	985–2295	.004–.016	.008–.119
Aluminium Alloy (ADC12, A390)	Si>10%	●	**F**	1	**AZ**	**HTi10**	985–2295	.004–.016	.008–.119
		◔	**F**	1	**AZ**	**HTi10**	985–2295	.004–.016	.008–.119
		✣	**F**	1	**AZ**	**HTi10**	985–2295	.004–.016	.008–.119

CUTTING CONDITIONS : ● : Stable Cutting ◔ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
S									
Titanium Alloy (Ti-6Al-4V)	—	●	**F**	1	**FJ**	**RT9010**	115—245	.002—.005	.008—.056
		◐	**F**	1	**FJ**	**RT9010**	115—245	.002—.005	.008—.056
		✣	**F**	1	**FJ**	**RT9010**	115—245	.002—.005	.008—.056
S									
Heat Resistant Alloy (Inconel718)	—	●	**F**	1	**FJ**	**VP10RT**	65—150	.002—.005	.008—.056
		◐	**F**	1	**FJ**	**VP10RT**	65—150	.002—.005	.008—.056
		✣	**F**	1	**FJ**	**VP10RT**	65—150	.002—.005	.008—.056

RECOMMENDED CUTTING CONDITIONS

11° POSITIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P									
Mild Steel (AISI ASTM A283, AISI 1010)	≤180HB	●	F	1	R-R/L	NX2525	740–1050	.002–.005	.008–.024
		●	L	1	R-Std	NX2525	605–870	.004–.012	.012–.079
		●	M	1	R-Std	NX2525	605–870	.004–.012	.012–.079
		◐	F	1	R-R/L	NX2525	740–1050	.002–.005	.008–.024
		◐	L	1	R-Std	UE6110	670–1150	.004–.012	.012–.079
		◐	L	2	R-Std	MP3025	620–970	.004–.012	.012–.079
		◐	L	3	R-Std	NX3035	590–835	.004–.012	.012–.079
		◐	M	1	R-Std	UE6110	670–1150	.004–.012	.012–.079
		◐	M	2	R-Std	MP3025	620–970	.004–.012	.012–.079
		◐	M	3	R-Std	NX3035	590–835	.004–.012	.012–.079
		✣	F	1	R-R/L	UTi20T	375–540	.002–.005	.008–.024
		✣	L	1	R-Std	UE6020	640–1050	.004–.012	.012–.079
		✣	L	2	N-Flat	UE6020	640–1050	.004–.012	.012–.079
		✣	L	3	N-Flat	UP20M	345–525	.004–.012	.012–.079
		✣	M	1	R-Std	UE6020	640–1050	.004–.012	.012–.079
		✣	M	2	N-Flat	UE6020	640–1050	.004–.012	.012–.079
		✣	M	3	N-Flat	UP20M	345–525	.004–.012	.012–.079
Carbon Steel • Alloy Steel (AISI 1045, AISI 4140)	180 | 280HB	●	F	1	R-R/L	NX2525	540–770	.002–.005	.008–.024
		●	L	1	R-Std	NX2525	440–640	.004–.012	.012–.079
		●	M	1	R-Std	NX2525	440–640	.004–.012	.012–.079
		◐	F	1	R-R/L	NX2525	540–770	.002–.005	.008–.024
		◐	L	1	R-Std	UE6110	490–850	.004–.012	.012–.079
		◐	L	2	R-Std	MP3025	460–705	.004–.012	.012–.079
		◐	L	3	R-Std	NX3035	425–620	.004–.012	.012–.079
		◐	M	1	R-Std	UE6110	490–850	.004–.012	.012–.079
		◐	M	2	R-Std	MP3025	460–705	.004–.012	.012–.079
		◐	M	3	R-Std	NX3035	425–620	.004–.012	.012–.079
		✣	F	1	R-R/L	UTi20T	280–395	.002–.005	.008–.024
		✣	L	1	R-Std	UE6020	475–770	.004–.012	.012–.079
		✣	L	2	N-Flat	UE6020	475–770	.004–.012	.012–.079
		✣	L	3	N-Flat	UP20M	245–375	.004–.012	.012–.079
		✣	M	1	R-Std	UE6020	475–770	.004–.012	.012–.079
		✣	M	2	N-Flat	UE6020	475–770	.004–.012	.012–.079
		✣	M	3	N-Flat	UP20M	245–375	.004–.012	.012–.079

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

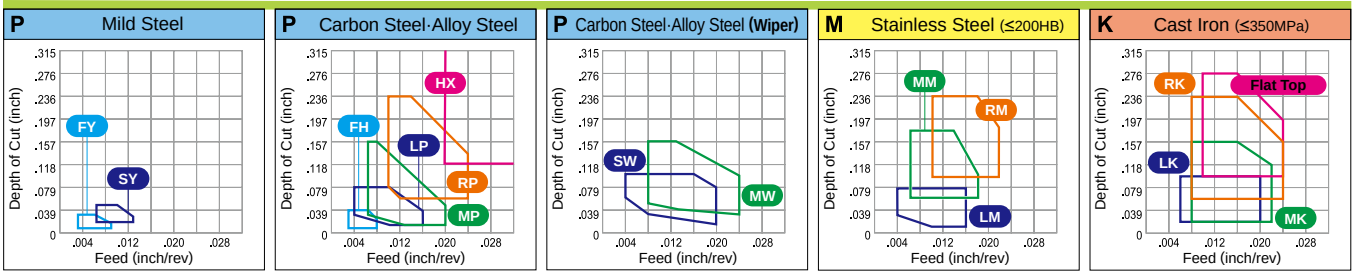
Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
K									
Gray Cast Iron (AISI No 45 B)	≤350MPa	●	F	1	R-R/L	NX2525	490–670	.002–.005	.008–.024
		●	L	1	N-Flat	UC5105	440–820	.004–.012	.012–.079
		●	L	2	N-Flat	NX2525	410–560	.004–.012	.012–.079
		●	L	3	R-Std	NX2525	410–560	.004–.012	.012–.079
		●	M	1	N-Flat	UC5105	440–820	.004–.012	.012–.079
		●	M	2	N-Flat	NX2525	410–560	.004–.012	.012–.079
		◐	M	3	R-Std	NX2525	410–560	.004–.012	.012–.079
		◐	F	1	R-R/L	NX2525	490–670	.002–.005	.008–.024
		◐	F	2	R-R/L	HTi10	330–475	.002–.005	.008–.024
		◐	L	1	N-Flat	UC5115	425–805	.004–.012	.012–.079
		◐	L	2	N-Flat	UE6110	425–655	.004–.012	.012–.079
		◐	M	1	N-Flat	UC5115	425–805	.004–.012	.012–.079
		◐	M	2	N-Flat	UE6110	425–655	.004–.012	.012–.079
		✣	F	1	R-R/L	UTi20T	260–375	.002–.005	.008–.024
		✣	L	1	N-Flat	VP15TF	375–525	.004–.012	.012–.079
		✣	M	1	N-Flat	VP15TF	375–525	.004–.012	.012–.079
Ductile Cast Iron	≤450MPa	●	F	1	R-R/L	NX2525	460–620	.002–.005	.008–.024
		●	L	1	N-Flat	UC5105	425–770	.004–.012	.012–.079
		●	L	2	N-Flat	NX2525	375–525	.004–.012	.012–.079
		●	L	3	R-Std	NX2525	375–525	.004–.012	.012–.079
		●	M	1	N-Flat	UC5105	425–770	.004–.012	.012–.079
		●	M	2	N-Flat	NX2525	375–525	.004–.012	.012–.079
		●	M	3	R-Std	NX2525	375–525	.004–.012	.012–.079
		◐	F	1	R-R/L	NX2525	460–620	.002–.005	.008–.024
		◐	F	2	R-R/L	HTi10	310–440	.002–.005	.008–.024
		◐	L	1	N-Flat	UC5115	410–755	.004–.012	.012–.079
		◐	L	2	N-Flat	UE6110	395–620	.004–.012	.012–.079
		◐	M	1	N-Flat	UC5115	410–755	.004–.012	.012–.079
		◐	M	2	N-Flat	UE6110	395–620	.004–.012	.012–.079
		✣	F	1	R-R/L	UTi20T	245–360	.002–.005	.008–.024
		✣	L	1	N-Flat	VP15TF	360–490	.004–.012	.012–.079
		✣	M	1	N-Flat	VP15TF	360–490	.004–.012	.012–.079
	≤800MPa	●	F	1	R-R/L	NX2525	410–560	.002–.005	.008–.024
		●	L	1	N-Flat	UC5105	375–690	.004–.012	.012–.079
		●	L	2	N-Flat	NX2525	345–460	.004–.012	.012–.079
		●	L	3	R-Std	NX2525	345–460	.004–.012	.012–.079
		●	M	1	N-Flat	UC5105	375–690	.004–.012	.012–.079
		●	M	2	N-Flat	NX2525	345–460	.004–.012	.012–.079
		●	M	3	R-Std	NX2525	345–460	.004–.012	.012–.079
		◐	F	1	R-R/L	NX2525	410–560	.002–.005	.008–.024
		◐	F	2	R-R/L	HTi10	280–395	.002–.005	.008–.024
		◐	L	1	N-Flat	UC5115	360–670	.004–.012	.012–.079
		◐	L	2	N-Flat	UE6110	345–560	.004–.012	.012–.079
		◐	M	1	N-Flat	UC5115	360–670	.004–.012	.012–.079
		◐	M	2	N-Flat	UE6110	345–560	.004–.012	.012–.079
		✣	F	1	R-R/L	UTi20T	210–310	.002–.005	.008–.024
		✣	L	1	N-Flat	VP15TF	310–440	.004–.012	.012–.079
		✣	M	1	N-Flat	VP15TF	310–440	.004–.012	.012–.079

80° CN TYPE INSERTS WITH HOLE

CNMG 4 3 0.5 FH
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
FH	**CNMG430.5FH**	CNMG120402-FH	.008	●	▲																					●	●	●										C006 –009 E021 E024 H006 –008
	CNMG**431FH**	CNMG120404-FH	.016	●	▲																					★		●	●									
	CNMG**432FH**	CNMG120408-FH	.031	●																						★		●	●									
	CNMG**433FH**	CNMG120412-FH	.047																							★			★									
Finish Cutting																																						
FS	**CNMG431FS**	CNMG120404-FS	.016		▲																					★			●									C006 –009 E021 E024 H006 –008
	CNMG**432FS**	CNMG120408-FS	.031																							★			●									
Finish Cutting																																						
FY	**CNMG431FY**	CNMG120404-FY	.016		▲																					●		●		★								C006 –009 E021 E024 H006 –008
	CNMG**432FY**	CNMG120408-FY	.031		▲																							●		★								
Finish Cutting																																						
FJ	**CNGG43V5FJ**	CNGG1204V5-FJ	.002																					●												★		C006 –009 E021 E024 H006 –008
	CNGG**430.2FJ**	CNGG120401-FJ	.004																					●												★		
	CNGG**430.5FJ**	CNGG120402-FJ	.008																					●												★		
	CNGG**431FJ**	CNGG120404-FJ	.016																					●	★											★		
	CNGG**432FJ**	CNGG120408-FJ	.031																					●	●											●		
FJ-P	**CNGG430.2FJ-P**	CNGG120401-FJ-P	.004																																	●		C006 –009 E021 E024 H006 –008
	CNGG**430.5FJ-P**	CNGG120402-FJ-P	.008																																	●		
	CNGG**43V5FJ-P**	CNGG1204V5-FJ-P	.002																																	●		
Finish Cutting																																						
PK	**CNGG431PK**	CNGG120404-PK	.016																							★												C006 –009 E021 E024 H006 –008
Finish Cutting																																						

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																				Cermet		Coated Cermet			Carbide						Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	
LP	CNMG431LP	CNMG120404-LP	.016	●	●			●																				●								C006
	CNMG432LP	CNMG120408-LP	.031	●	●		●	●																				●								–009
	CNMG433LP	CNMG120412-LP	.047	●	●		●	●																												E021
																																				E024
																																				H006
Light Cutting																																				–008
LM	CNMG431LM	CNMG120404-LM	.016								●	●	●																							C006
	CNMG432LM	CNMG120408-LM	.031								●	●	●																							–009
	CNMG433LM	CNMG120412-LM	.047								●	●	●																							E021
																																				E024
																																				H006
Light Cutting																																				–008
NEW LK	CNMG431LK	CNMG120404-LK	.016													●	●																			C006
	CNMG432LK	CNMG120408-LK	.031													●	●																			–009
	CNMG433LK	CNMG120412-LK	.047													●	●																			E021
																																				E024
																																				H006
Light Cutting																																				–008
NEW LS	CNMG431LS	CNMG120404-LS	.016																		●	●														C006
	CNMG432LS	CNMG120408-LS	.031																		●	●														–009
																																				E021
																																				E024
																																				H006
Light Cutting																																				–008
SH	CNMG32.51SH	CNMG09T304-SH	.016		★										★																					C006
	CNMG32.52SH	CNMG09T308-SH	.031		★																															–009
	CNMG431SH	CNMG120404-SH	.016	●	●	▲	●	●							●				●								★	●		★						E021
	CNMG432SH	CNMG120408-SH	.031	●	●	▲	●	●							●				●								★	●		★						E024
	CNMG433SH	CNMG120412-SH	.047	●	●	▲	●	●																												H006
Light Cutting																																				–008
SA	CNMG431SA	CNMG120404-SA	.016	●	●	▲	●	●							●													●								C006
	CNMG432SA	CNMG120408-SA	.031	●	●	▲	●	●						▲	●													●								–009
	CNMG433SA	CNMG120412-SA	.047	●	●	▲	●	●																				●								E021
																																				E024
																																				H006
Light Cutting																																				–008
SW (With Wiper)	*CNMG431SW	CNMG120404-SW	.016	●	●		●							▲					●								★	●	●							C006
	*CNMG432SW	CNMG120408-SW	.031	●	●		●							▲					●								★	●	●							–009
	*CNMG433SW	CNMG120412-SW	.047	●	●		●							▲														●	●							E021
																																				E024
																																				H006
Light Cutting																																				–008
SY	CNMG431SY	CNMG120404-SY	.016			▲																							●	★						C006
	CNMG432SY	CNMG120408-SY	.031			▲																							●	★						–009
																																				E021
																																				E024
																																				H006
Light Cutting																																				–008

*Please refer to page A032 before using the SW breaker (wiper insert).

■ = MIRACLE SIGMA

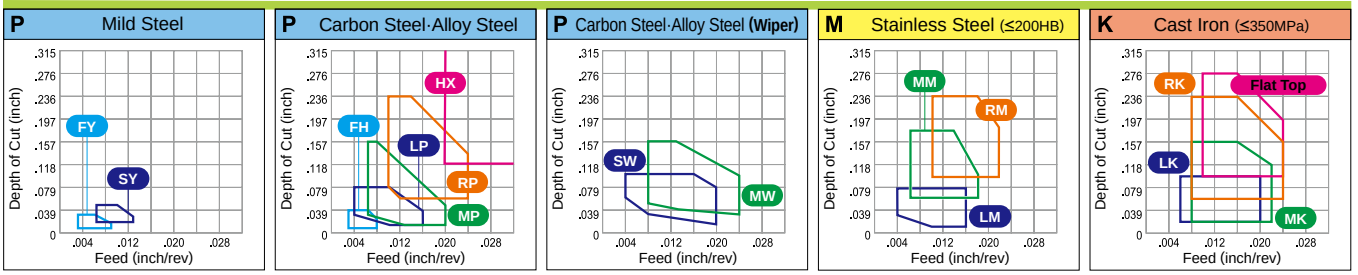
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

80° CN TYPE INSERTS WITH HOLE

CNMG 4 3 1 C
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	UE6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
C	**CNMG431C**	CNMG120404-C	.016																							★●												C006
	CNMG**432C**	CNMG120408-C	.031																							★●												−009 E021 E024 H006 −008
Light Cutting																																						
MJ	**CNMG431MJ**	CNMG120404-MJ	.016												★								●●													●		C006
	CNMG**432MJ**	CNMG120408-MJ	.031												★								●●												●		−009 E021 E024 H006 −008
	CNMG**433MJ**	CNMG120412-MJ	.047												★								★★														
Light Cutting	CNMG**434MJ**	CNMG120416-MJ	.063												★								★★														
MJ	**CNGG431MJ**	CNGG120404-MJ	.016																				●●											●	●		C006
	CNGG**432MJ**	CNGG120408-MJ	.031																				●●											●	●		−009 E021 E024 H006 −008
Light Cutting																																						
MP	**CNMG431MP**	CNMG120404-MP	.016	●●	▲	●●													●										●								C006
	CNMG**432MP**	CNMG120408-MP	.031	●●	▲	●●													●										●								−009 E021 E024 H006 −008
	CNMG**433MP**	CNMG120412-MP	.047	●●	▲	●●													●										●								
	CNMG**434MP**	CNMG120416-MP	.063	●●	▲	●●													●																		
	CNMG**542MP**	CNMG160608-MP	.031	●●	▲		●												●																		
Medium Cutting	CNMG**543MP**	CNMG160612-MP	.047	●●	▲		●												●																		
	CNMG**544MP**	CNMG160616-MP	.063	●●	▲		●												●																		
MM	**CNMG432MM**	CNMG120408-MM	.031								●●	●																									C006
	CNMG**433MM**	CNMG120412-MM	.047								●●	●																									−009 E021 E024 H006 −008
	CNMG**434MM**	CNMG120416-MM	.063								●●	●																									
	CNMG**542MM**	CNMG160608-MM	.031								●●	●																									
	CNMG**543MM**	CNMG160612-MM	.047								●●	●																									
	CNMG**544MM**	CNMG160616-MM	.063								●●	●																									
	CNMG**642MM**	CNMG190608-MM	.031								●●	●																									
Medium Cutting	CNMG**643MM**	CNMG190612-MM	.047								●●	●																									
	CNMG**644MM**	CNMG190616-MM	.063								●●	●																									

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																				Cermet		Coated Cermet			Carbide							Applicable Holder Page
				UE6105	UE6110	UE6020	NEW MC6015	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	NEW MC5005	NEW MC5015	UC5105	UC5115	NEW MP9005	NEW MP9015	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	NEW MT9015	
NEW MK	**CNMG431MK**	CNMG120404-MK	.016														●	●																			C006
	CNMG432MK	CNMG120408-MK	.031														●	●																			−009
	CNMG433MK	CNMG120412-MK	.047														●	●																			E021 E024 H006
Medium Cutting																																					−008
GM	**CNMG431GM**	CNMG120404-GM	.016								●	●	●																								C006
	CNMG432GM	CNMG120408-GM	.031								●	●	●																								−009
	CNMG433GM	CNMG120412-GM	.047								●	●	●																								E021 E024 H006
Medium Cutting																																					−008
NEW GK	**CNMG431GK**	CNMG120404-GK	.016														●	●																			C006
	CNMG432GK	CNMG120408-GK	.031														●	●																			−009
	CNMG433GK	CNMG120412-GK	.047														●	●																			E021 E024 H006
Medium Cutting																																					−008
MA	**CNMG431MA**	CNMG120404-MA	.016	●	●	▲	●	●			●	●	▲	●			●	●	●	●					●		●										
	CNMG432MA	CNMG120408-MA	.031	●	●	▲	●	●	●		●	●	▲	●			●	●	●	●					●		●										
	CNMG433MA	CNMG120412-MA	.047	●	●	▲	●	●	●		●	●	▲	●					●	●					●		●										C006
	CNMG434MA	CNMG120416-MA	.063	●	●	▲							▲	★					●																		−009
	CNMG542MA	CNMG160608-MA	.031	●	●	▲	○	○	●					★					●																		E021 E024
	CNMG543MA	CNMG160612-MA	.047	●	●	▲	○	○	●				▲	●					●																		H006
	CNMG544MA	CNMG160616-MA	.063	●	●		○	○						●					●																		−008
Medium Cutting	**CNMG643MA**	CNMG190612-MA	.047	●	●	▲	○	○	●				▲	●					●	●																	
	CNMG644MA	CNMG190616-MA	.063		●	▲	○	○						●					●																		
MH	**CNMG431MH**	CNMG120404-MH	.016	●	●	▲			★				▲																								
	CNMG432MH	CNMG120408-MH	.031	●	●	▲	●	●	●				▲						●																		
	CNMG433MH	CNMG120412-MH	.047	●	●	▲	●	●	●				▲						●																		C006
	CNMG434MH	CNMG120416-MH	.063	●	●	▲													●																		−009
	CNMG542MH	CNMG160608-MH	.031	●	★														●																		E021 E024
	CNMG543MH	CNMG160612-MH	.047	●	●	▲	○	○					▲						●																		H006
	CNMG544MH	CNMG160616-MH	.063	●	★														★																		−008
Medium Cutting	**CNMG643MH**	CNMG190612-MH	.047	●	●	▲	○	○	●				▲						★																		
	CNMG644MH	CNMG190616-MH	.063	●	●	▲																															
Standard	**CNMG322**	CNMG090308	.031		●																															
	CNMG32.51	CNMG09T304	.016		★		○	○																		★										C006
	CNMG32.52	CNMG09T308	.031		★		○	○																		★										−009
	CNMG431	CNMG120404	.016	●	●	▲	●	●	●										●	●						★	●	●			●		●				E021 E024
	CNMG432	CNMG120408	.031	●	●	▲	●	●	●										●	●					●	★		●			●		●				H006
Medium Cutting	**CNMG433**	CNMG120412	.047	●	●	▲	●	●	★										●	●					●	★											−008
	CNMG434	CNMG120416	.063	●	●		○	○											★	★																	

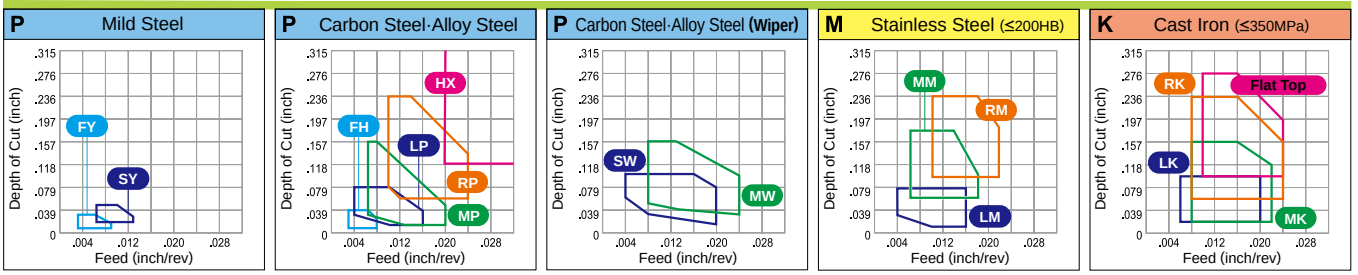
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

80° CN TYPE INSERTS WITH HOLE

CNMG 5 4 3
Size Thickness Corner Radius
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ··· Rough Cutting ··· Heavy Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020 (NEW)	UE6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
Standard	CNMG542	CNMG160608	.031	●	●	▲	○	●																														
	CNMG543	CNMG160612	.047	●	●	▲	○	●											●	●																		
	CNMG544	CNMG160616	.063	●	●		○	●											★	★																		
	CNMG642	CNMG190608	.031	●	●	▲	○	●	★																													
	CNMG643	CNMG190612	.047	●	●	▲	○	●	●												●	●																
Medium Cutting	CNMG644	CNMG190616	.063	●	●	▲	○	●	●												★																	
MW (With Wiper)	★1 CNMG432MW	CNMG120408-MW	.031	●	●	▲	●	●							▲						●	●																
	★1 CNMG433MW	CNMG120412-MW	.047	●	●	▲	●	●							▲						●	●																
Medium Cutting																																						
MS	CNMG321MS	CNMG090304-MS	.016												●																						
	CNMG322MS	CNMG090308-MS	.031		●										●																						
	CNMG32.51MS	CNMG09T304-MS	.016												★																	★					
	CNMG32.52MS	CNMG09T308-MS	.031		★										★																						
	CNMG431MS	CNMG120404-MS	.016		●	▲								▲	●	●					●	●	●	●	●	●							★		●	●	
	CNMG432MS	CNMG120408-MS	.031		●	▲								▲	●	●					●	●	●	●	●	●						●	★		●	●	
	CNMG433MS	CNMG120412-MS	.047		●									▲	●	●					●	●	★	●	●										★	●	
	CNMG542MS	CNMG160608-MS	.031												★																						
	CNMG543MS	CNMG160612-MS	.047												●						●	●														●	●	
NEW	CNMG544MS	CNMG160616-MS	.063																		●	●															●	
	CNMG643MS	CNMG190612-MS	.047												●																						
Medium Cutting	CNMG644MS	CNMG190616-MS	.063												●																						
	CNMP432	CNMP120408	.031												●																						
Medium Cutting																																						

★1 Please refer to page A032 before using the MW breaker (wiper insert).
★2 New design MS breaker : MP9005, MP9015, MT9015

■ = MIRACLE SIGMA

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	● ◕ ✣ ● ◕ ✣ ✣ ✣
M	Stainless Steel	○ ◔ ✣ ○ ✣
K	Cast Iron	◕ ✣ ● ◕
N	Non-Ferrous Metal	◕ ✣ ●
S	Heat-resistant Alloy, Titanium Alloy	● ● ◕ ● ✣ ✣ ✣ ○ ◕ ✣ ✣ ● ● ◕ ✣ ● ● ● ✣ ● ● ◕ ● ●

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																							Cermet		Coated Cermet			Carbide						Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	
RP	**CNMG432RP**	CNMG120408-RP	.031	●	●		●	●																													
	CNMG**433RP**	CNMG120412-RP	.047	●	●		●	●																													C006–009 E021 E024 H006–008
	CNMG**434RP**	CNMG120416-RP	.063	●	●		●	●																													
	CNMG**543RP**	CNMG160612-RP	.047	●	●		●	●																													
	CNMG**544RP**	CNMG160616-RP	.063	●	●		●	●																													
	CNMG**643RP**	CNMG190612-RP	.047	●	●		●	●																													
Rough Cutting	CNMG**644RP**	CNMG190616-RP	.063	●	●		●	●																													
RM	**CNMG432RM**	CNMG120408-RM	.031								●	●	●																								
	CNMG**433RM**	CNMG120412-RM	.047								●	●	●																								C006–009 E021 E024 H006–008
	CNMG**434RM**	CNMG120416-RM	.063								●	●	●																								
	CNMG**543RM**	CNMG160612-RM	.047								●	●	●																								
	CNMG**544RM**	CNMG160616-RM	.063								●	●	●																								
Rough Cutting	CNMG**643RM**	CNMG190612-RM	.047								●	●	●																								
	CNMG**644RM**	CNMG190616-RM	.063								●	●	●																								
NEW **RK**	**CNMG432RK**	CNMG120408-RK	.031													●	●																				
	CNMG**433RK**	CNMG120412-RK	.047													●	●																				C006–009 E021 E024 H006–008
	CNMG**434RK**	CNMG120416-RK	.063													●	●																				
	CNMG**543RK**	CNMG160612-RK	.047													●	●																				
	CNMG**544RK**	CNMG160616-RK	.063													●	●																				
Rough Cutting	CNMG**643RK**	CNMG190612-RK	.047													●	●																				
	CNMG**644RK**	CNMG190616-RK	.063													●	●																				
NEW **RS**	**CNMG432RS**	CNMG120408-RS	.031																			●														●
	CNMG**433RS**	CNMG120412-RS	.047																			●														●	C006–009 E021 E024 H006–008
	CNMG**434RS**	CNMG120416-RS	.063																			●														●	
	CNMG**543RS**	CNMG160612-RS	.047																			●														●	
	CNMG**544RS**	CNMG160616-RS	.063																			●														●	
Rough Cutting	CNMG**643RS**	CNMG190612-RS	.047																			●														●	
	CNMG**644RS**	CNMG190616-RS	.063																			●														●	
GH	**CNMG432GH**	CNMG120408-GH	.031	●	●	▲			●				▲	●					●	●																	
	CNMG**433GH**	CNMG120412-GH	.047	●	●	▲							▲	●					●	●																	C006–009 E021 E024 H006–008
	CNMG**434GH**	CNMG120416-GH	.063	●	★														●	●																	
	CNMG**543GH**	CNMG160612-GH	.047	●	●	▲							▲	●					●	●																	
	CNMG**544GH**	CNMG160616-GH	.063	●	●														●	●																	
Rough Cutting	CNMG**643GH**	CNMG190612-GH	.047	●	●	▲								●					●	●																	
	CNMG**644GH**	CNMG190616-GH	.063	●	●	▲							▲	●					●	●																	
GJ	**CNMG432GJ**	CNMG120408-GJ	.031												●								●	●											●		
	CNMG**433GJ**	CNMG120412-GJ	.047												●								●	●											●		C006–009 E021 E024 H006–008
	CNMG**434GJ**	CNMG120416-GJ	.063												●								★	★											★		
	CNMG**543GJ**	CNMG160612-GJ	.047												●								●												●		
	CNMG**643GJ**	CNMG190612-GJ	.047												●								●												●		
Rough Cutting	CNMG**644GJ**	CNMG190616-GJ	.063												●								●												●		

■ = MIRACLE SIGMA

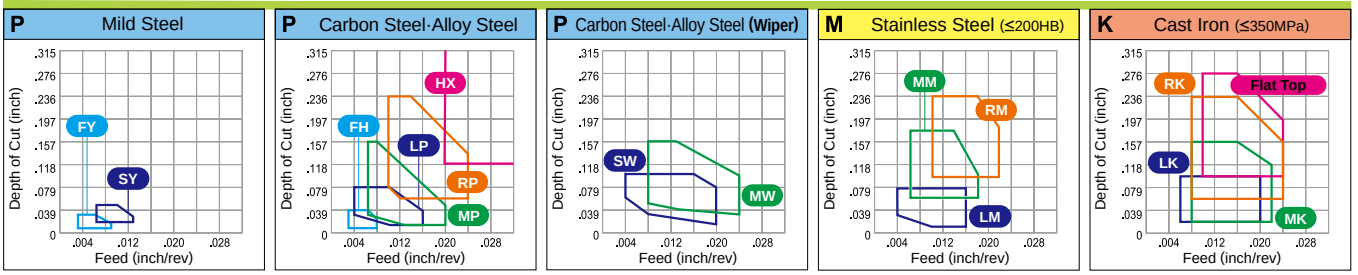
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

80° CN TYPE INSERTS WITH HOLE

CNMM 4 3 2 HZ
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ··· Rough Cutting ··· Heavy Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated UE6105	UE6110	UE6020	UE6015 NEW	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 NEW	MC5015 NEW	UC5105	UC5115	MP9005 NEW	MP9015 NEW	VP05RT	VP10RT	VP15TF	UP20M	Cermet NX2525	NX3035	Coated Cermet MP3025	AP25N	VP25N	Carbide UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 NEW	Applicable Holder Page
HZ	**CNMM432HZ**	CNMM120408-HZ	.031	●	▲																																	
	CNMM**433HZ**	CNMM120412-HZ	.047	●	▲																																	C006 −009 E021 E024 H006 −008
	CNMM**543HZ**	CNMM160612-HZ	.047	●	▲																																	
	CNMM**544HZ**	CNMM160616-HZ	.063	●	▲																																	
	CNMM**643HZ**	CNMM190612-HZ	.047	●	▲					★																												
Heavy Cutting	CNMM**644HZ**	CNMM190616-HZ	.063	●	▲					★																												
HX	**CNMM643HX**	CNMM190612-HX	.047	●	▲					★																												
	CNMM**644HX**	CNMM190616-HX	.063	●	▲					★																												C007 −009 E024
	CNMM**646HX**	CNMM190624-HX	.094	●	▲					★																												
Heavy Cutting	CNMM**866HX**	CNMM250924-HX	.094	●	▲					★																												
HV	**CNMM644HV**	CNMM190616-HV	.063	●	▲					★																												
	CNMM**646HV**	CNMM190624-HV	.094	●	▲					★																												C007 −009 E024
	CNMM**866HV**	CNMM250924-HV	.094	●	▲					★																												
Heavy Cutting																																						
Flat Top	**CNMA431**	CNMA120404	.016													●	●	●	●														★	●				
	CNMA**432**	CNMA120408	.031													●	●	●	●														★	●				
	CNMA**433**	CNMA120412	.047													●	●	●	●																			C006 −009 E021 E024 H006 −008
	CNMA**434**	CNMA120416	.063													●	●	●	●																			
	CNMA**543**	CNMA160612	.047																●	●																		
	CNMA**544**	CNMA160616	.063																●	●																		
	CNMA**643**	CNMA190612	.047																●	●																		
	CNMA**644**	CNMA190616	.063																●	●																		

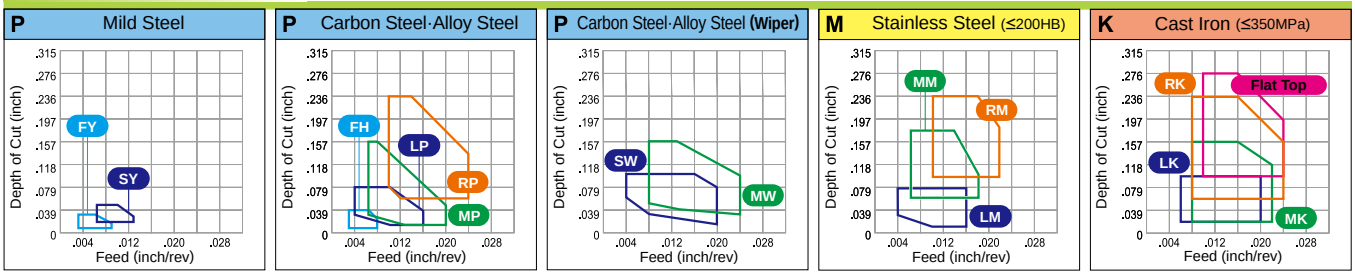
● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

55° DN TYPE INSERTS WITH HOLE

DNMG 4 3 0.5 FH
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
FH	**DNMG430.5FH**	DNMG150402-FH	.008		●	▲																				●	●	●										C010 −012 E021 E024 H009 −011
	DNMG431FH	DNMG150404-FH	.016		●																					★	●	●	●									
	DNMG432FH	DNMG150408-FH	.031		●																					★		●	●									
	DNMG440.5FH	DNMG150602-FH	.008		●	▲																				★	★	●										
	DNMG441FH	DNMG150604-FH	.016		★	▲																						●										
Finish Cutting	**DNMG442FH**	DNMG150608-FH	.031		★	▲																						●										
FS	**DNMG431FS**	DNMG150404-FS	.016																							★			●									C010 −012 E021 E024 H009 −011
	DNMG432FS	DNMG150408-FS	.031			▲																				★			●									
Finish Cutting																																						
FY	**DNMG431FY**	DNMG150404-FY	.016			▲																					●	●		★								C010 −012 E021 E024 H009 −011
	DNMG432FY	DNMG150408-FY	.031			▲																						●		★								
	DNMG441FY	DNMG150604-FY	.016																									★										
Finish Cutting	**DNMG442FY**	DNMG150608-FY	.031			▲																						★										
FJ	**DNGG431FJ**	DNGG150404-FJ	.016																					★	★											★		C010 −012 E021 E024 H009 −011
	DNGG432FJ	DNGG150408-FJ	.031																					●	●											●		
Finish Cutting																																						
PK	**DNGG431PK**	DNGG150404-PK	.016																							★												C010 −012 E021 E024 H009 −011
Finish Cutting																																						

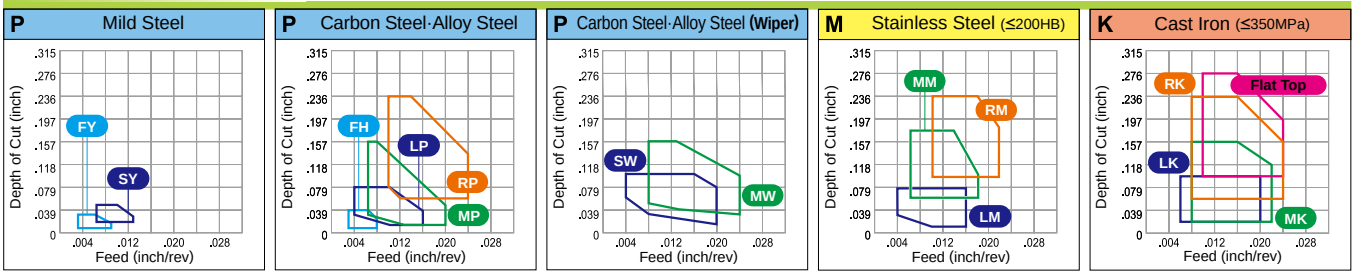
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

55° DN TYPE INSERTS WITH HOLE

DNMG 3 3 1 LP
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ··· Rough Cutting ··· Heavy Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✲ Unstable Cutting

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	UE6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
LP	**DNMG331LP**	DNMG110404-LP	.016	●	●		●	●																				●									
	DNMG**332LP**	DNMG110408-LP	.031	●	●		●	●																				●									
	DNMG**431LP**	DNMG150404-LP	.016	●	●		●	●																				●									C010
	DNMG**432LP**	DNMG150408-LP	.031	●	●		●	●																				●									–012 E021
	DNMG**433LP**	DNMG150412-LP	.047	●	●		●	●																				●									E024
	DNMG**441LP**	DNMG150604-LP	.016	●	●		●	●																				●									H009
	DNMG**442LP**	DNMG150608-LP	.031	●	●		●	●																				●									–011
Light Cutting	DNMG**443LP**	DNMG150612-LP	.047	●	●		●	●																													
LM	**DNMG331LM**	DNMG110404-LM	.016								●	●	●																								
	DNMG**332LM**	DNMG110408-LM	.031								●	●	●																								
	DNMG**431LM**	DNMG150404-LM	.016								●	●	●																								C010
	DNMG**432LM**	DNMG150408-LM	.031								●	●	●																								–012 E021
	DNMG**433LM**	DNMG150412-LM	.047								●	●	●																								E024
	DNMG**441LM**	DNMG150604-LM	.016								●	●	●																								H009
	DNMG**442LM**	DNMG150608-LM	.031								●	●	●																								–011
Light Cutting	DNMG**443LM**	DNMG150612-LM	.047								●	●	●																								
NEW **LK**	**DNMG431LK**	DNMG150404-LK	.016														●	●																			C010
	DNMG**432LK**	DNMG150408-LK	.031														●	●																			–012 E021
	DNMG**433LK**	DNMG150412-LK	.047														●	●																			E024
	DNMG**441LK**	DNMG150604-LK	.016														●	●																			H009
	DNMG**442LK**	DNMG150608-LK	.031														●	●																			–011
Light Cutting	DNMG**443LK**	DNMG150612-LK	.047														●	●																			
NEW **LS**	**DNMG431LS**	DNMG150404-LS	.016																		●	●														●	C010
	DNMG**432LS**	DNMG150408-LS	.031																		●	●														●	–012 E021
	DNMG**441LS**	DNMG150604-LS	.016																		●	●														●	E024
Light Cutting	DNMG**442LS**	DNMG150608-LS	.031																		●	●														●	H009 –011

■ = MIRACLE SIGMA

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																				Cermet		Coated Cermet			Carbide						Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	
SH	**DNMG331SH**	DNMG110404-SH	.016	●	●										★																					
	DNMG**332SH**	DNMG110408-SH	.031	●	●										●																					
	DNMG**431SH**	DNMG150404-SH	.016	●	●	▲	●	●							●				●							★	●		★							C010 –012 E021 E024 H009 –011
	DNMG**432SH**	DNMG150408-SH	.031	●	●	▲	●	●							●				●							★	●		★							
	DNMG**433SH**	DNMG150412-SH	.047	●	●	▲	●	●							●				★							★			★							
	DNMG**441SH**	DNMG150604-SH	.016	★	★																															
	DNMG**442SH**	DNMG150608-SH	.031	★	★														★																	
Light Cutting	DNMG**443SH**	DNMG150612-SH	.047	★	★														★																	
SA	**DNMG431SA**	DNMG150404-SA	.016	●	●	▲	●	●																		●										C010 –012 E021 E024 H009 –011
	DNMG**432SA**	DNMG150408-SA	.031	●	●	▲	●	●						▲	●											●										
	DNMG**433SA**	DNMG150412-SA	.047	●	●	▲	●	●																		●										
	DNMG**441SA**	DNMG150604-SA	.016	★	★	▲																				★										
	DNMG**442SA**	DNMG150608-SA	.031	★	★	▲																				★										
Light Cutting	DNMG**443SA**	DNMG150612-SA	.047	★	★	▲																				★										
SW (With Wiper)	⁎**DNMX331SW**	DNMX110404-SW	.016	●			○																													C010 E021 H009 H011
	⁎DNMX**332SW**	DNMX110408-SW	.031	●			○																													
	⁎DNMX**431SW**	DNMX150404-SW	.016	●	●		○							▲												★	●	●								
	⁎DNMX**432SW**	DNMX150408-SW	.031	●	●		○							▲												★	●	●								
	⁎DNMX**433SW**	DNMX150412-SW	.047	●	●		○							▲												●	●									
	⁎DNMX**441SW**	DNMX150604-SW	.016	●	●		○							▲												★	★	★								
	⁎DNMX**442SW**	DNMX150608-SW	.031	●	●		○							▲												★	★	★								
Light Cutting	⁎DNMX**443SW**	DNMX150612-SW	.047	●	●		○							▲												●	●									
SY	**DNMG431SY**	DNMG150404-SY	.016			▲																					●	●								C010 –012 E021 E024 H009 –011
	DNMG**432SY**	DNMG150408-SY	.031			▲																						●		★						
	DNMG**441SY**	DNMG150604-SY	.016																									★								
Light Cutting	DNMG**442SY**	DNMG150608-SY	.031			▲																						★								
C	**DNMG431C**	DNMG150404-C	.016																							★	●									C010 –012 E021 E024 H009 –011
	DNMG**432C**	DNMG150408-C	.031																							★	●									
	DNMG**441C**	DNMG150604-C	.016																							★	★									
Light Cutting	DNMG**442C**	DNMG150608-C	.031																							★	★									
MJ	**DNMG431MJ**	DNMG150404-MJ	.016												★								●	●											●	
	DNMG**432MJ**	DNMG150408-MJ	.031												★								●	●											●	
	DNMG**433MJ**	DNMG150412-MJ	.047												★								★	★												C010 –012 E021 E024 H009 –011
	DNMG**434MJ**	DNMG150416-MJ	.063												★								★	★												
	DNMG**441MJ**	DNMG150604-MJ	.016												★								★	★												
	DNMG**442MJ**	DNMG150608-MJ	.031												★								★	★												
	DNMG**443MJ**	DNMG150612-MJ	.047												★								★	★												
Light Cutting	DNMG**444MJ**	DNMG150616-MJ	.063												★								★	★												

⁎Please refer to page A032 before using the SW breaker (wiper insert).

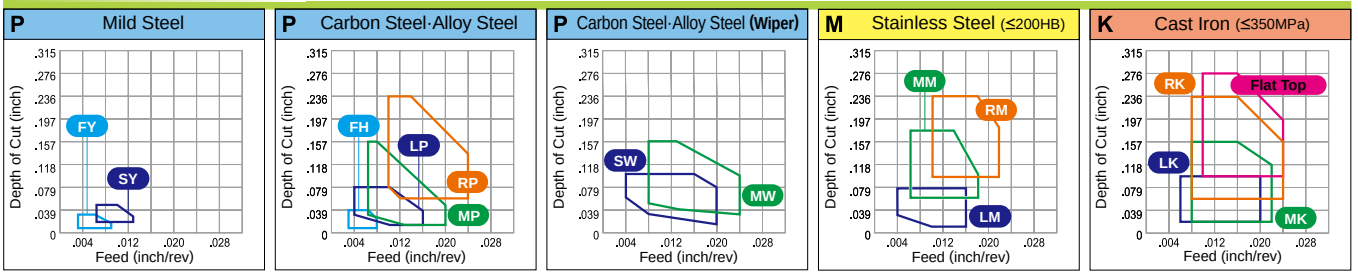
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

55° DN TYPE INSERTS WITH HOLE

DNGM 4 3 1 MJ
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
MJ	**DNGM431MJ**	DNGM150404-MJ	.016																				●	★									●		●			C010
	DNGM**432MJ**	DNGM150408-MJ	.031																				●	★									●		●			−012
																																						E021 E024 H009 −011
Light Cutting																																						
MP	**DNGM431MP**	DNGM150404-MP	.016	●	●	▲	●	●											●										●								C010
	DNGM**432MP**	DNGM150408-MP	.031	●	●	▲	●	●											●										●								−012
	DNGM**433MP**	DNGM150412-MP	.047	●	●	▲	●	●											●										●								E021
	DNGM**434MP**	DNGM150416-MP	.063	●	●	▲	●	●											●																		E024
	DNGM**441MP**	DNGM150604-MP	.016	★	★	▲	●	●											★										★								H009
	DNGM**442MP**	DNGM150608-MP	.031	★	★	▲	●	●											★										★								−011
	DNGM**443MP**	DNGM150612-MP	.047	★	★	▲	●	●											★										★								
Medium Cutting	DNGM**444MP**	DNGM150616-MP	.063	★	★	▲	●	●											★																		
MM	**DNGM432MM**	DNGM150408-MM	.031								●	●	●																								C010
	DNGM**433MM**	DNGM150412-MM	.047								●	●	●																								−012
	DNGM**442MM**	DNGM150608-MM	.031								●	●	●																								E021
	DNGM**443MM**	DNGM150612-MM	.047								●	●	●																								E024
Medium Cutting																																					H009 −011
NEW **MK**	**DNGM431MK**	DNGM150404-MK	.016														●	●																			C010
	DNGM**432MK**	DNGM150408-MK	.031														●	●																			−012
	DNGM**433MK**	DNGM150412-MK	.047														●	●																			E021
	DNGM**441MK**	DNGM150604-MK	.016														●	●																			E024
	DNGM**442MK**	DNGM150608-MK	.031														●	●																			H009
Medium Cutting	DNGM**443MK**	DNGM150612-MK	.047														●	●																			−011
NEW **GK**	**DNGM431GK**	DNGM150404-GK	.016														●	●																			C010
	DNGM**432GK**	DNGM150408-GK	.031														●	●																			−012
	DNGM**433GK**	DNGM150412-GK	.047														●	●																			E021
	DNGM**441GK**	DNGM150604-GK	.016														●	●																			E024
	DNGM**442GK**	DNGM150608-GK	.031														●	●																			H009
Medium Cutting	DNGM**443GK**	DNGM150612-GK	.047														●	●																			−011

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																				Cermet		Coated Cermet			Carbide						Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	
GM	**DNMG431GM**	DNMG150404-GM	.016								●	●	●																							
	DNMG**432GM**	DNMG150408-GM	.031								●	●	●																							C010 –012 E021 E024 H009 –011
	DNMG**433GM**	DNMG150412-GM	.047								●	●	●																							
	DNMG**441GM**	DNMG150604-GM	.016								●	●	●																							
	DNMG**442GM**	DNMG150608-GM	.031								●	●	●																							
Medium Cutting	DNMG**443GM**	DNMG150612-GM	.047								●	●	●																							
MA	**DNMG331MA**	DNMG110404-MA	.016	●	●		○	○							●																					
	DNMG**332MA**	DNMG110408-MA	.031	●	●		○	○							●																					
	DNMG**333MA**	DNMG110412-MA	.047	●	★		○	○																												
	DNMG**431MA**	DNMG150404-MA	.016	●	●	▲	●	●				●	●	▲	●		●	●	●	●					●		●									C010 –012 E021 E024 H009 –011
	DNMG**432MA**	DNMG150408-MA	.031	●	●	▲	●	●	●			●	●	▲	●		●	●	●	●					●		●									
	DNMG**433MA**	DNMG150412-MA	.047	●	●	▲	●	●	●			●	●		●					●					●		●									
	DNMG**441MA**	DNMG150604-MA	.016	★	●	▲	●	●				●	●	▲	★		●	●							●		★									
	DNMG**442MA**	DNMG150608-MA	.031	★	●	▲	●	●	★			●	●	▲	★		●	●	★	★					●		★									
Medium Cutting	DNMG**443MA**	DNMG150612-MA	.047	★	●	▲	●	●				●	●	▲	★				★	★					●		★									
	DNMG**444MA**	DNMG150616-MA	.063		★																															
MH	**DNMG431MH**	DNMG150404-MH	.016	●	●	▲																														
	DNMG**432MH**	DNMG150408-MH	.031	●	●	▲	●	●	●					▲					●																	C010 –012 E021 E024 H009 –011
	DNMG**433MH**	DNMG150412-MH	.047	●	●	▲	●	●						▲					●																	
	DNMG**441MH**	DNMG150604-MH	.016	★	★														★																	
	DNMG**442MH**	DNMG150608-MH	.031	★	★	▲	●	●						▲					★																	
Medium Cutting	DNMG**443MH**	DNMG150612-MH	.047	★	★	▲	●	●											★																	
Standard	**DNMG332**	DNMG110408	.031		●																															
	DNMG**431**	DNMG150404	.016	●	●	▲	●	●											●	●							★	●	●				●			
	DNMG**432**	DNMG150408	.031	●	●	▲	●	●											●	●					●		★	●	●				●			C010 –012 E021 E024 H009 –011
	DNMG**433**	DNMG150412	.047	●	●	▲	●	●											●	●					●		★									
	DNMG**434**	DNMG150416	.063		●		○	○																												
	DNMG**441**	DNMG150604	.016	★	★	▲	○	○											★	★							★		★							
	DNMG**442**	DNMG150608	.031	★	●	▲	●	●											★	★					●		★		★							
Medium Cutting	DNMG**443**	DNMG150612	.047	★	★	▲	●	●											★	★					●											
	DNMG**444**	DNMG150616	.063		●		○	○																												
MW (With Wiper)	✻**DNMX432MW**	DNMX150408-MW	.031	●	●		○												●	●																
	✻DNMX**433MW**	DNMX150412-MW	.047	●	●		○												●	●																C010 E021 H009 H011
	✻DNMX**442MW**	DNMX150608-MW	.031	★	●		○							▲					★	★																
Medium Cutting	✻DNMX**443MW**	DNMX150612-MW	.047	★	●		○																													

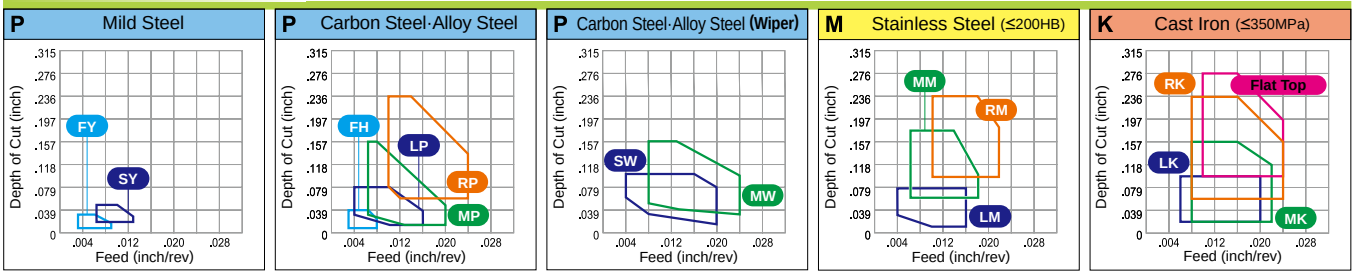
✻Please refer to page A032 before using the MW breaker (wiper insert).

55° DN TYPE INSERTS WITH HOLE

DNMG 3 3 2 MS
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
MS	**DNMG332MS**	DNMG110408-MS	.031	●											★																						
	DNMG**431MS**	DNMG150404-MS	.016	●	▲									▲	●	●					●	●	●	●	●												●	
	DNMG**432MS**	DNMG150408-MS	.031	●										▲	●	●					●	●	●	●	●	●										●	●	C010 –012 E021 E024 H009 –011
	DNMG**433MS**	DNMG150412-MS	.047	★											●	●					●	●	★	★												●	
	DNMG**441MS**	DNMG150604-MS	.016	★										▲	★	★					●	●	●	★		★										●	
	DNMG**442MS**	DNMG150608-MS	.031	★										▲	★	★					●	●	●	★												●	
Medium Cutting	DNMG**443MS**	DNMG150612-MS	.047	★												★					●	●	●	★												●	
R/L	**DNGG431R**	DNGG150404R	.016																							★	●				★		★				
	DNGG**431L**	DNGG150404L	.016																							★	●				★		★				
	DNGG**432R**	DNGG150408R	.031																							★	●				★						C010 –012 E021 E024 H009 –011
	DNGG**432L**	DNGG150408L	.031																							★	●										
	DNGG**441R**	DNGG150604R	.016																							★					★						
	DNGG**441L**	DNGG150604L	.016																							★											
	DNGG**442R**	DNGG150608R	.031																							★											
Medium Cutting	DNGG**442L**	DNGG150608L	.031																							★											
RP	**DNMG432RP**	DNMG150408-RP	.031	●	●		●	●																													
	DNMG**433RP**	DNMG150412-RP	.047	●	●		●	●																													
	DNMG**434RP**	DNMG150416-RP	.063	●	●		●	●																													C010 –012 E021 E024 H009 –011
	DNMG**442RP**	DNMG150608-RP	.031	●	●		●	●																													
	DNMG**443RP**	DNMG150612-RP	.047	●	●		●	●																													
Rough Cutting	DNMG**444RP**	DNMG150616-RP	.063	●	●		●	●																													
RM	**DNMG432RM**	DNMG150408-RM	.031								●	●	●																								
	DNMG**433RM**	DNMG150412-RM	.047								●	●	●																								
	DNMG**434RM**	DNMG150416-RM	.063								●	●	●																								C010 –012 E021 E024 H009 –011
	DNMG**442RM**	DNMG150608-RM	.031								●	●	●																								
	DNMG**443RM**	DNMG150612-RM	.047								●	●	●																								
Rough Cutting	DNMG**444RM**	DNMG150616-RM	.063								●	●	●																								

★New design MS breaker : MP9005, MP9015, MT9015

■ = MIRACLE SIGMA

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																			Cermet		Coated Cermet			Carbide						Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	
(NEW) RK	DNMG432RK	DNMG150408-RK	.031														●	●																		C010
	DNMG433RK	DNMG150412-RK	.047														●	●																		–012
	DNMG442RK	DNMG150608-RK	.031														●	●																		E021
	DNMG443RK	DNMG150612-RK	.047														●	●																		E024
Rough Cutting																																				H009
																																				–011
(NEW) RS	DNMG432RS	DNMG150408-RS	.031																		●														●	
	DNMG433RS	DNMG150412-RS	.047																		●														●	C010
	DNMG434RS	DNMG150416-RS	.063																		●														●	–012
	DNMG442RS	DNMG150608-RS	.031																		●														●	E021
	DNMG443RS	DNMG150612-RS	.047																		●														●	E024
Rough Cutting	DNMG444RS	DNMG150616-RS	.063																		●														●	H009
																																				–011
GH	DNMG432GH	DNMG150408-GH	.031	●	●	▲									●				●	●																C010
	DNMG433GH	DNMG150412-GH	.047	●	●	▲								▲	●				●	●																–012
	DNMG442GH	DNMG150608-GH	.031	★	●	▲									★				★	★																E021
	DNMG443GH	DNMG150612-GH	.047	★	●	▲									★				★	★																E024
Rough Cutting																																				H009
																																				–011
GJ	DNMG432GJ	DNMG150408-GJ	.031												●								●	●										●		C010
	DNMG433GJ	DNMG150412-GJ	.047												●								●	●										●		–012
	DNMG434GJ	DNMG150416-GJ	.063												●								★	★										★		E021
	DNMG442GJ	DNMG150608-GJ	.031												★								★													E024
Rough Cutting	DNMG443GJ	DNMG150612-GJ	.047												★								★													H009
	DNMG444GJ	DNMG150616-GJ	.063												★								★													–011
HZ	DNMM432HZ	DNMM150408-HZ	.031		●	▲																														C010
	DNMM433HZ	DNMM150412-HZ	.047		●	▲																														–012
	DNMM442HZ	DNMM150608-HZ	.031		●	▲																														E021
	DNMM443HZ	DNMM150612-HZ	.047		●	▲																														E024
Heavy Cutting																																				H009
																																				–011
Flat Top	DNMA431	DNMA150404	.016														●	●	●	●													★				C010
	DNMA432	DNMA150408	.031														●	●	●	●							★					★	★			–012
	DNMA433	DNMA150412	.047														●	●	●	●																E021
(NEW)	DNMA441	DNMA150604	.016														●	●																		E024
	DNMA442	DNMA150608	.031														●	●	★	★																H009
	DNMA443	DNMA150612	.047														●	●	★	★																–011
Flat Top	DNGA431	DNGA150404	.016																													★				C010
	DNGA432	DNGA150408	.031																													★	★			–012
																																				E021
																																				E024
																																				H009
																																				–011

■ = MIRACLE SIGMA

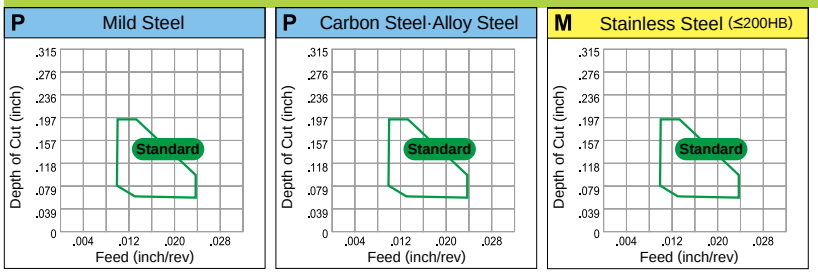
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

RN TYPE INSERTS WITH HOLE

RNMG 4 3
Size Thickness
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Medium Cutting···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
Standard	RNMG43	RNMG120400	—	●	▲	○	○																																
 Medium Cutting																																						C013

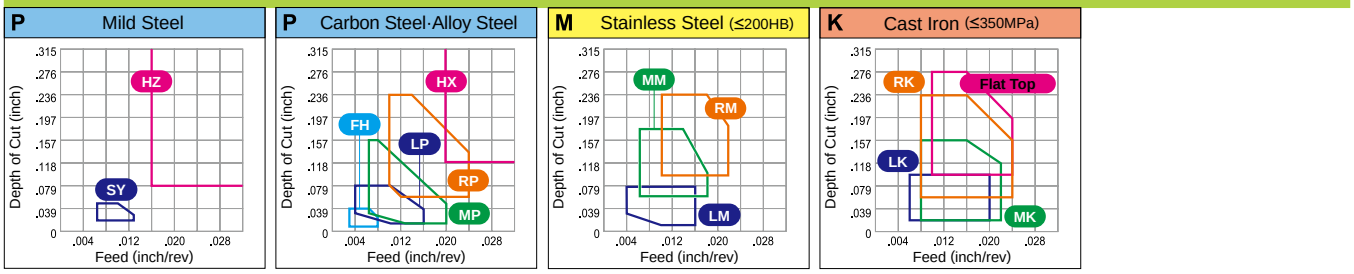
● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

90° SN TYPE INSERTS WITH HOLE

SNMG 3 2 1 FH
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ··· Rough Cutting ··· Heavy Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
FH	**SNMG321FH**	SNMG090304-FH	.016																							★											
	SNMG**322FH**	SNMG090308-FH	.031																							★			●								C014 −017 E022 E025
	SNMG**431FH**	SNMG120404-FH	.016		★																					★		●								
Finish Cutting	SNMG**432FH**	SNMG120408-FH	.031		●																							●								
FS	**SNMG432FS**	SNMG120408-FS	.031																							★											
Finish Cutting																																				C014 −017 E022 E025
LP	**SNMG431LP**	SNMG120404-LP	.016	●	●		●	●																				●								
	SNMG**432LP**	SNMG120408-LP	.031	●	●		●	●																				●								C014 −017 E022 E025
Light Cutting	SNMG**433LP**	SNMG120412-LP	.047	●	●		●	●																												
LM	**SNMG431LM**	SNMG120404-LM	.016								●	●	●																							
	SNMG**432LM**	SNMG120408-LM	.031								●	●	●																							C014 −017 E022 E025
Light Cutting																																				
NEW **LK**	**SNMG432LK**	SNMG120408-LK	.031														●	●																		
	SNMG**433LK**	SNMG120412-LK	.047														●	●																		C014 −017 E022 E025
Light Cutting																																				
SH	**SNMG431SH**	SNMG120404-SH	.016		★															●																
	SNMG**432SH**	SNMG120408-SH	.031	●	●	▲														●							★									C014 −017 E022 E025
Light Cutting	SNMG**433SH**	SNMG120412-SH	.047		★	▲														★																

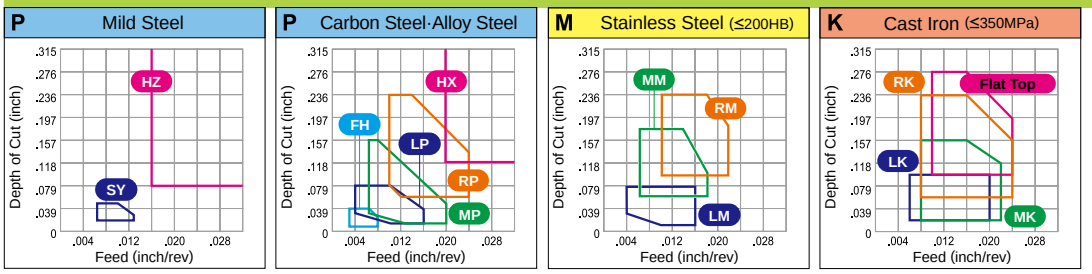
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

90° SN TYPE INSERTS WITH HOLE

SNMG 4 3 1 SA
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	UE6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
SA	**SNMG431SA**	SNMG120404-SA	.016		●																					●											
	SNMG**432SA**	SNMG120408-SA	.031	●	●	▲																				●											C014 −017 E022 E025
	SNMG**433SA**	SNMG120412-SA	.047		●	▲																				●											
Light Cutting																																					
SY	**SNMG432SY**	SNMG120408-SY	.031			▲																						●									
																																					C014 −017 E022 E025
Light Cutting																																					
C	**SNMG321C**	SNMG090304-C	.016																							★											
	SNMG**322C**	SNMG090308-C	.031																							★											C014 −017 E022 E025
	SNMG**432C**	SNMG120408-C	.031																							★	●										
Light Cutting	SNMG**434C**	SNMG120416-C	.063																							★											
R/L 1G	**SNMG431R1G**	SNMG120404R-1G	.016																							★											
	SNMG**431L1G**	SNMG120404L-1G	.016																							★											C014 −017 E022 E025
	SNMG**432R1G**	SNMG120408R-1G	.031																							★											
Light Cutting																																					
MP	**SNMG431MP**	SNMG120404-MP	.016	●	●	▲	●	●												●								●									
	SNMG**432MP**	SNMG120408-MP	.031	●	●	▲	●	●												★								●									C014 −017 E022 E025
	SNMG**433MP**	SNMG120412-MP	.047	●	●	▲	●	●												★								●									
Medium Cutting																																					

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																					Cermet		Coated Cermet			Carbide						Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	
MM	**SNMG432MM**	SNMG120408-MM	.031								●	●	●																								C014 −017 E022 E025
	**433MM**	SNMG120412-MM	.047								●	●	●																								
	434MM	SNMG120416-MM	.063								●	●	●																								
	542MM	SNMG150608-MM	.031								●	●	●																								
	543MM	SNMG150612-MM	.047								●	●	●																								
	544MM	SNMG150616-MM	.063								●	●	●																								
Medium Cutting	**643MM**	SNMG190612-MM	.047								●	●	●																								
	644MM	SNMG190616-MM	.063								●	●	●																								
NEW **MK**	**SNMG432MK**	SNMG120408-MK	.031														●	●																			
	**433MK**	SNMG120412-MK	.047														●	●																			C014 −017 E022 E025
	434MK	SNMG120416-MK	.063														●	●																			
Medium Cutting																																					
NEW **GK**	**SNMG431GK**	SNMG120404-GK	.016														●	●																			
	**432GK**	SNMG120408-GK	.031														●	●																			C014 −017 E022 E025
	433GK	SNMG120412-GK	.047														●	●																			
Medium Cutting																																					
GM	**SNMG431GM**	SNMG120404-GM	.016								●	●	●																								
	**432GM**	SNMG120408-GM	.031								●	●	●																								C014 −017 E022 E025
	433GM	SNMG120412-GM	.047								●	●	●																								
Medium Cutting																																					
MA	**SNMG431MA**	SNMG120404-MA	.016	●	●	▲	●	●			●	●		●		●	●		●					●			●										
	432MA	SNMG120408-MA	.031	●	●	▲	●	●	●		●	●	▲	●		●	●		●	●				●			●										
	433MA	SNMG120412-MA	.047	●	●	▲	●	●			●	●	▲	●					●	●				●			●										
	**434MA**	SNMG120416-MA	.063																●																		C014 −017 E022 E025
	542MA	SNMG150608-MA	.031	●	●	▲			●						★																					
	543MA	SNMG150612-MA	.047	●	★	▲	○	○	●						●				★																	
	544MA	SNMG150616-MA	.063		★		○	○																													
Medium Cutting	**643MA**	SNMG190612-MA	.047	●	●	▲	○	○	●						●				●																		
	644MA	SNMG190616-MA	.063	★	●	▲	○	○	●						★																					
MH	**SNMG432MH**	SNMG120408-MH	.031	●	●	▲	●	●					▲						●																		
	**433MH**	SNMG120412-MH	.047	●	●	▲	●	●					▲						●																		C014 −017 E022 E025
	643MH	SNMG190612-MH	.047	★	●	▲													★																	
	644MH	SNMG190616-MH	.063	★	●	▲																															
Medium Cutting																																					

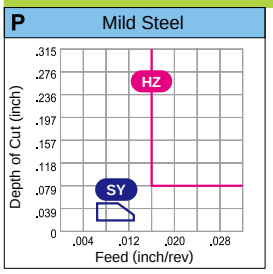
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

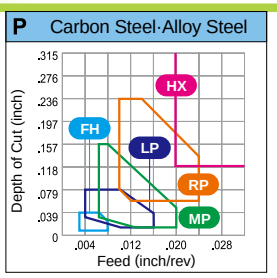
90° SN TYPE INSERTS WITH HOLE

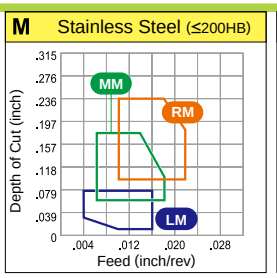
SNMG 3 2 1
Size Thickness Corner Radius
★Please refer to page A002.

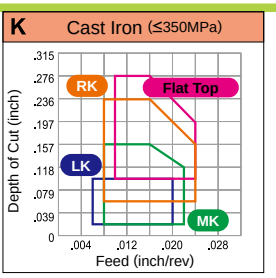
CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ··· Rough Cutting ··· Heavy Cutting ···









Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020 (NEW)	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
Standard	**SNMG321**	SNMG090304	.016	★	●	▲	●	●																		★	●	●			●						
	SNMG322	SNMG090308	.031	★	●	▲	●	●																		★	●	●			●	★	★				
	SNMG431	SNMG120404	.016	●	●	▲	●	●																		★		●			●		★				
	SNMG432	SNMG120408	.031	●	●	▲	●	●	●										★	★					●	★	●			●	★	★				
	**SNMG433**	SNMG120412	.047	●	●	▲	●	●											★	★							●			●	★					C014 −017 E022 E025
	SNMG434	SNMG120416	.063		●	▲	●	●											●	●							●			●						
	SNMG435	SNMG120420	.079			▲	●	●																												
	SNMG543	SNMG150612	.047	●	●	▲	○	●	●										●	●																
NEW	**SNMG544**	SNMG150616	.063				○	○																												
	SNMG643	SNMG190612	.047	●	●	▲	○	●	●										★	★												●				
Medium Cutting	**SNMG644**	SNMG190616	.063	★	●	▲	○	●	●											★												●				
MS	**SNMG321MS**	SNMG090304-MS	.016												★																					
	SNMG322MS	SNMG090308-MS	.031												★																					
	SNMG431MS	SNMG120404-MS	.016		★									▲	●						●	●														●	
	**SNMG432MS**	SNMG120408-MS	.031		●	▲								▲	●	●					●	●	★	★	★	●						●			●	●	C014 −017 E022 E025
	SNMG433MS	SNMG120412-MS	.047		★									▲	●	●					●	●	★	★	★											●	
	SNMG434MS	SNMG120416-MS	.063												★																					
NEW	**SNMG543MS**	SNMG150612-MS	.047																		●	●														●	
NEW	**SNMG544MS**	SNMG150616-MS	.063																		●	●														●	
Medium Cutting	**SNMG644MS**	SNMG190616-MS	.063												★																					
R/L	**SNGG321R**	SNGG090304R	.016																								★	★				★		★			
	SNGG321L	SNGG090304L	.016																								★	★				★					
	SNGG322R	SNGG090308R	.031																								★	★									
	**SNGG322L**	SNGG090308L	.031																								★	★									C014 −017 E022 E025
	SNGG431R	SNGG120404R	.016																								★	★	●			★					
	SNGG431L	SNGG120404L	.016																								★	★	●			★					
	SNGG432R	SNGG120408R	.031																								★	★	●								
Medium Cutting	**SNGG432L**	SNGG120408L	.031																								★	★	●			★		★			

★New design MS breaker : MP9005, MP9015, MT9015

■ = MIRACLE SIGMA

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																				Cermet		Coated Cermet			Carbide						Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	
RP	SNMG432RP	SNMG120408-RP	.031	●	●		●	●																												C014 –017 E022 E025
	SNMG433RP	SNMG120412-RP	.047	●	●		●	●																												
	SNMG434RP	SNMG120416-RP	.063	●	●		●	●																												
	SNMG543RP	SNMG150612-RP	.047	●	●		●	●																												
	SNMG544RP	SNMG150616-RP	.063	●	●		●	●																												
	SNMG643RP	SNMG190612-RP	.047	●	●		●	●																												
Rough Cutting	SNMG644RP	SNMG190616-RP	.063	●	●		●	●																												
RM	SNMG432RM	SNMG120408-RM	.031								●	●	●																							C014 –017 E022 E025
	SNMG433RM	SNMG120412-RM	.047								●	●	●																							
	SNMG434RM	SNMG120416-RM	.063								●	●	●																							
	SNMG543RM	SNMG150612-RM	.047								●	●	●																							
	SNMG544RM	SNMG150616-RM	.063								●	●	●																							
	SNMG643RM	SNMG190612-RM	.047								●	●	●																							
Rough Cutting	SNMG644RM	SNMG190616-RM	.063								●	●	●																							
NEW RK	SNMG432RK	SNMG120408-RK	.031													●	●																			C014 –017 E022 E025
	SNMG433RK	SNMG120412-RK	.047													●	●																			
	SNMG434RK	SNMG120416-RK	.063													●	●																			
Rough Cutting																																				
NEW RS	SNMG432RS	SNMG120408-RS	.031																			●													●	
	SNMG433RS	SNMG120412-RS	.047																			●													●	C014 –017 E022 E025
	SNMG434RS	SNMG120416-RS	.063																			●													●	
	SNMG544RS	SNMG150616-RS	.063																			●													●	
Rough Cutting	SNMG644RS	SNMG190616-RS	.063																			●													●	
GH	SNMG432GH	SNMG120408-GH	.031	●	●	▲								▲	★				●	●																
	SNMG433GH	SNMG120412-GH	.047	●	●	▲								▲	★				●	●																
	SNMG434GH	SNMG120416-GH	.063	●	●										★																						
	SNMG543GH	SNMG150612-GH	.047	★	●																																C014 –017 E022 E025
	SNMG544GH	SNMG150616-GH	.063		●																															
	SNMG643GH	SNMG190612-GH	.047	★	●				●						●																					
Rough Cutting	SNMG644GH	SNMG190616-GH	.063	●	●				●					▲	●																					
	SNMG866GH	SNMG250924-GH	.094			▲									●																					
HZ	SNMM432HZ	SNMM120408-HZ	.031		●	▲																														C014 –017 E022 E025
	SNMM433HZ	SNMM120412-HZ	.047		●	▲																														
	SNMM543HZ	SNMM150612-HZ	.047		●	▲																														
	SNMM643HZ	SNMM190612-HZ	.047		●	▲				★																										
Heavy Cutting	SNMM644HZ	SNMM190616-HZ	.063		●	▲				★																										
HX	SNMM643HX	SNMM190612-HX	.047		●	▲				★																										C014 –017 E025
	SNMM644HX	SNMM190616-HX	.063		●	▲				★																										
	SNMM646HX	SNMM190624-HX	.094		●	▲				★																										
	SNMM856HX	SNMM250724-HX	.094		●	▲				★																										
Heavy Cutting	SNMM866HX	SNMM250924-HX	.094		●	▲				★																										

■ = MIRACLE SIGMA

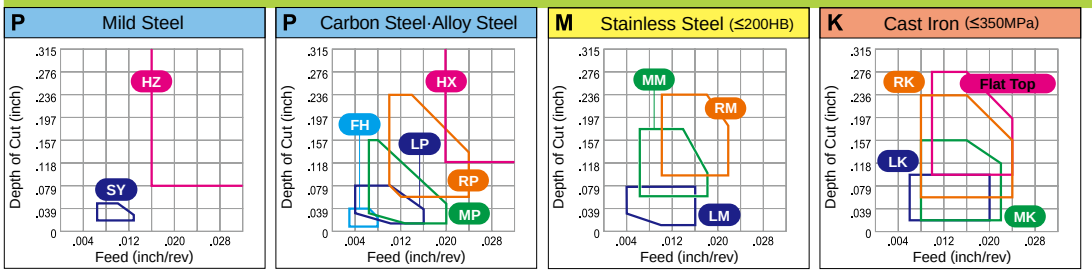
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

90° SN TYPE INSERTS WITH HOLE

SNMM 6 4 3 HV
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ··· Rough Cutting ··· Heavy Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
HV	SNMM644HV	SNMM190616-HV	.063	●	▲					★																											
	SNMM646HV	SNMM190624-HV	.094	●	▲					★																											C014 −017 E025
	SNMM856HV	SNMM250724-HV	.094	●	▲					★																											
	SNMM866HV	SNMM250924-HV	.094	●	▲					★																											
Heavy Cutting																																					
Flat Top	SNMA321	SNMA090304	.016																														★				
	SNMA322	SNMA090308	.031																●	●														●			
	SNMA432	SNMA120408	.031														●	●	●	●												●	★	★			C014 −017 E022 E025
	SNMA433	SNMA120412	.047														●	●	●	●														★			
	SNMA434	SNMA120416	.063														●	●	●	●																	
	SNMA543	SNMA150612	.047																	●																	
	SNMA643	SNMA190612	.047																●	●																	
	SNMA644	SNMA190616	.063																●	●																	
Flat Top	SNGA321	SNGA090304	.016																								★										
	SNGA431	SNGA120404	.016																															★			C014 −017 E022 E025
	SNGA432	SNGA120408	.031																								★							★	★		

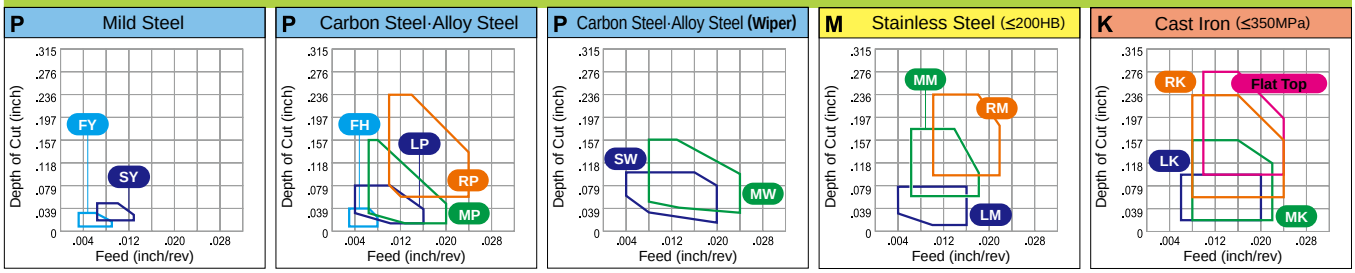
● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

60° TN TYPE INSERTS WITH HOLE

TNMG 2 2 1 FH
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ··· Rough Cutting ··· Heavy Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																				Cermet		Coated Cermet			Carbide						Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	
FH	**TNMG221FH**	TNMG110304-FH	.016																							★										
	TNMG**330.5FH**	TNMG160402-FH	.008		● ▲																					●	●	●								C018 −023 E022 E025
	TNMG**331FH**	TNMG160404-FH	.016		●																					★	●	●	●							
Finish Cutting	TNMG**332FH**	TNMG160408-FH	.031		● ▲																					★	●	●	●							
FS	**TNMG331FS**	TNMG160404-FS	.016			▲																				★										
	TNMG**332FS**	TNMG160408-FS	.031			▲																				★										C018 −023 E022 E025
Finish Cutting																																					
FY	**TNMG331FY**	TNMG160404-FY	.016			▲																					●	●		★							
	TNMG**332FY**	TNMG160408-FY	.031			▲																						●		★							C018 −023 E022 E025
Finish Cutting																																					
PK	**TNGG331PK**	TNGG160404-PK	.016																							★										
	TNGG**332PK**	TNGG160408-PK	.031																							★										C018 −023 E022 E025
Finish Cutting																																					
R/L FS	**TNGG330.5RFS**	TNGG160402R-FS	.008																							★										
	TNGG**330.5LFS**	TNGG160402L-FS	.008																							★										C018 −023 E022 E025
	TNGG**331RFS**	TNGG160404R-FS	.016																							★										
Finish Cutting	TNGG**331LFS**	TNGG160404L-FS	.016																							★										
R/L F	**TNGG330.5RF**	TNGG160402R-F	.008																					●		★ ★	●									
	TNGG**330.5LF**	TNGG160402L-F	.008																					●		★ ★	●									C018 −023 E022 E025
	TNGG**331RF**	TNGG160404R-F	.016																					●		★ ★	●									
	TNGG**331LF**	TNGG160404L-F	.016																					●		★ ★	●									
Finish Cutting	TNGG**332RF**	TNGG160408R-F	.031																					●		★ ★	●									
	TNGG**332LF**	TNGG160408L-F	.031																					●		★ ★	●									

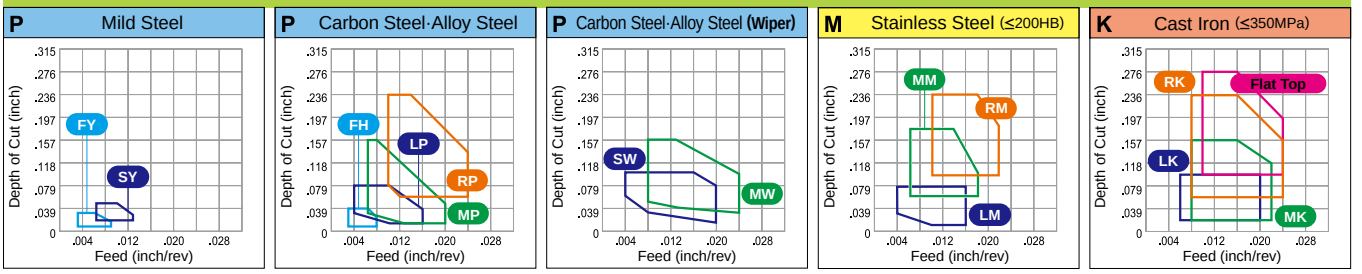
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

60° TN TYPE INSERTS WITH HOLE

TNMG 3 3 1 LP
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ··· Rough Cutting ··· Heavy Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	UE6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
LP	**TNMG331LP**	TNMG160404-LP	.016	●	●		●	●																				●									
	TNMG332LP	TNMG160408-LP	.031	●	●		●	●																				●									C018 −023 E022 E025
	TNMG333LP	TNMG160412-LP	.047	●	●		●	●																				●									
	TNMG432LP	TNMG220408-LP	.031	●	●		●	●																				●									
Light Cutting	**TNMG433LP**	TNMG220412-LP	.047	●	●		●	●																													
LM	**TNMG331LM**	TNMG160404-LM	.016								●	●	●																								
	TNMG332LM	TNMG160408-LM	.031								●	●	●																								C018 −023 E022 E025
Light Cutting	**TNMG333LM**	TNMG160412-LM	.047								●	●	●																								
NEW **LK**	**TNMG331LK**	TNMG160404-LK	.016														●	●																			
	TNMG332LK	TNMG160408-LK	.031														●	●																			C018 −023 E022 E025
Light Cutting																																					
NEW **LS**	**TNMG331LS**	TNMG160404-LS	.016																		●	●														●	
	TNMG332LS	TNMG160408-LS	.031																		●	●														●	C018 −023 E022 E025
Light Cutting																																					
SH	**TNMG331SH**	TNMG160404-SH	.016	●	●	▲	●	●							●					●							★	●		★							
	TNMG332SH	TNMG160408-SH	.031	●	●	▲	●	●							●					●							★	●		★							C018 −023 E022 E025
	TNMG432SH	TNMG220408-SH	.031	●	●										●																						
Light Cutting																																					
SA	**TNMG331SA**	TNMG160404-SA	.016	●	●	▲	●	●																			●										
	TNMG332SA	TNMG160408-SA	.031	●	●	▲	●	●																			●										C018 −023 E022 E025
	TNMG333SA	TNMG160412-SA	.047	●	●	▲																					●										
Light Cutting	**TNMG432SA**	TNMG220408-SA	.031	●	●	▲																															
	TNMG433SA	TNMG220412-SA	.047		●																																

■ = MIRACLE SIGMA

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	● ◕ ✣ ◕ ✣ ✣ ✣
M	Stainless Steel	○ ◔ ✣ ○ ✣
K	Cast Iron	◕ ✣ ● ◕
N	Non-Ferrous Metal	●
S	Heat-resistant Alloy, Titanium Alloy	● ◕ ◕ ✣

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																							Cermet		Coated Cermet			Carbide						Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	
SW (With Wiper)	✱**TNMX331SW**	TNMX160404-SW	.016	●	●		○							▲													★	●	●									
	✱TNMX**332SW**	TNMX160408-SW	.031	●	●		○							▲													★	●	●									
Light Cutting																																						C018
SY	**TNMG331SY**	TNMG160404-SY	.016			▲																						●	●	★								
	TNMG**332SY**	TNMG160408-SY	.031			▲																							●	★								C018 −023 E022 E025
Light Cutting																																						
C	**TNMG331C**	TNMG160404-C	.016																								★	●										
	TNMG**332C**	TNMG160408-C	.031																								★	●										C018 −023 E022 E025
	TNMG**431C**	TNMG220404-C	.016																								★	●		●								
Light Cutting	TNMG**432C**	TNMG220408-C	.031																									●										
R/L 1G	**TNMG331R1G**	TNMG160404R-1G	.016																								★											
	TNMG**331L1G**	TNMG160404L-1G	.016																								★											C018 −023 E022 E025
	TNMG**431R1G**	TNMG220404R-1G	.016																								★											
Light Cutting	TNMG**431L1G**	TNMG220404L-1G	.016																								★											
R/L K	**TNGG330.5RK**	TNGG160402R-K	.008																								★	★	●									
	TNGG**330.5LK**	TNGG160402L-K	.008																								★	★	●									
	TNGG**331RK**	TNGG160404R-K	.016																								★	★	●									C018 −023 E022 E025
	TNGG**331LK**	TNGG160404L-K	.016																									★	●									
	TNGG**332LK**	TNGG160408L-K	.031																										●									
Light Cutting	TNGG**332RK**	TNGG160408R-K	.031																										●									
MJ	**TNMG331MJ**	TNMG160404-MJ	.016												★								●	●												●		
	TNMG**332MJ**	TNMG160408-MJ	.031												★								●	●												●		C018 −023 E022 E025
	TNMG**333MJ**	TNMG160412-MJ	.047												★								★	★														
Light Cutting																																						
MP	**TNMG331MP**	TNMG160404-MP	.016	●	●	▲	●	●											●										●									
	TNMG**332MP**	TNMG160408-MP	.031	●	●	▲	●	●											●										●									C018 −023 E022 E025
	TNMG**333MP**	TNMG160412-MP	.047	●	●	▲	●	●											●										●									
	TNMG**432MP**	TNMG220408-MP	.031	●	●	▲	●	●											●																			
Medium Cutting	TNMG**433MP**	TNMG220412-MP	.047	●	●	▲	●	●											●																			
MM	**TNMG332MM**	TNMG160408-MM	.031								●	●	●																									
	TNMG**333MM**	TNMG160412-MM	.047								●	●	●																									C018 −023 E022 E025
	TNMG**432MM**	TNMG220408-MM	.031								●	●	●																									
	TNMG**433MM**	TNMG220412-MM	.047								●	●	●																									
Medium Cutting	TNMG**434MM**	TNMG220416-MM	.063								●	●	●																									

✱Please refer to page A032 before using the SW breaker (wiper insert).

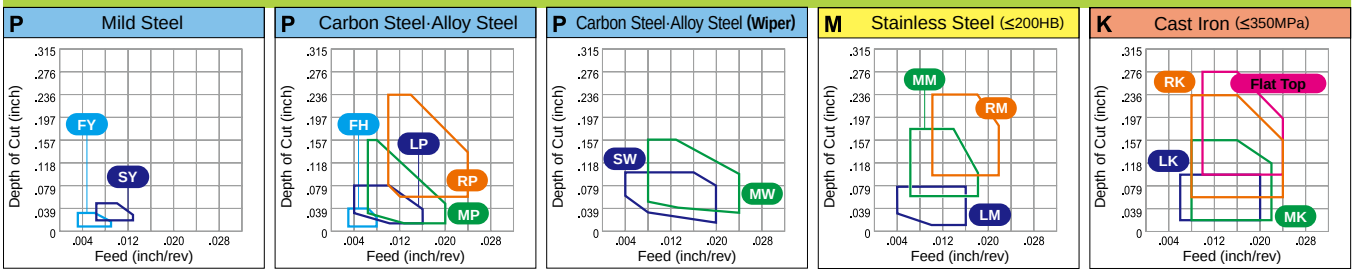
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

60° TN TYPE INSERTS WITH HOLE

TNMG 3 3 1 MK
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ··· Rough Cutting ··· Heavy Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020 (NEW)	UE6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
(NEW) MK	TNMG331MK	TNMG160404-MK	.016														●	●																			
	TNMG332MK	TNMG160408-MK	.031														●	●																			
	TNMG333MK	TNMG160412-MK	.047														●	●																			
Medium Cutting																																					C018 −023 E022 E025
(NEW) GK	TNMG331GK	TNMG160404-GK	.016														●	●																			
	TNMG332GK	TNMG160408-GK	.031														●	●																			
	TNMG333GK	TNMG160412-GK	.047														●	●																			
Medium Cutting																																					C018 −023 E022 E025
GM	TNMG331GM	TNMG160404-GM	.016								●	●	●																							
	TNMG332GM	TNMG160408-GM	.031								●	●	●																							
	TNMG333GM	TNMG160412-GM	.047								●	●	●																							
	TNMG432GM	TNMG220408-GM	.031								●	●	●																							
Medium Cutting	TNMG433GM	TNMG220412-GM	.047								●	●	●																							
MA	TNMG321MA	TNMG160304-MA	.016			▲																															C018 −023 E022 E025
	TNMG322MA	TNMG160308-MA	.031			▲																															
	TNMG331MA	TNMG160404-MA	.016	●	●	▲	●	●				●	●	▲	●		●	●	●	●					●		●										
	TNMG332MA	TNMG160408-MA	.031	●	●	▲	●	●	●			●	●	▲	●		●	●	●	●					●		●										
	TNMG333MA	TNMG160412-MA	.047	●	●	▲	●	●				●	●	▲	●				●						●		●										
	TNMG334MA	TNMG160416-MA	.063																●																		
	TNMG432MA	TNMG220408-MA	.031	●	●	▲	●	●	●			●	●	▲	●				●	●					●												
	TNMG433MA	TNMG220412-MA	.047	●	●	▲	●	●	●			●	●	▲	●				●						●												
	TNMG434MA	TNMG220416-MA	.063																●																		
Medium Cutting	TNMG542MA	TNMG270608-MA	.031	●	●	▲			●																												
	TNMG543MA	TNMG270612-MA	.047	●	●	▲										●																					
MH	TNMG331MH	TNMG160404-MH	.016	●	●	▲								▲					●																		
	TNMG332MH	TNMG160408-MH	.031	●	●	▲	●	●	★					▲					●																		
	TNMG333MH	TNMG160412-MH	.047	●	●	▲	●	●	★					▲					●																		
	TNMG432MH	TNMG220408-MH	.031	●	●	▲	○	○	●					▲					●																		
Medium Cutting	TNMG433MH	TNMG220412-MH	.047	●	●	▲	○	○	●										●																		

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	● ◕ ✣ ◕ ✣ ✣
M	Stainless Steel	○ ◕ ✣ ○ ✣
K	Cast Iron	◕ ✣ ● ◕
N	Non-Ferrous Metal	●
S	Heat-resistant Alloy, Titanium Alloy	● ● ● ● ✣

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
Standard	**TNMG221**	TNMG110304	.016	●	▲	●	●												●	●					●		★		●			★		★				
	TNMG**222**	TNMG110308	.031	●	▲	●	●												●	●					●													
	TNMG**321**	TNMG160304	.016	●		○	○																				★	●				●						
	TNMG**322**	TNMG160308	.031	●	▲	●	●																									●						
	TNMG**331**	TNMG160404	.016	●	●	▲	●	●											★	★					●		★	●	●			●	★	●				
	TNMG**332**	TNMG160408	.031	●	●	▲	●	●	●										★	★					●		★	●	●			●	★	●				
	TNMG**333**	TNMG160412	.047	★	●	▲	●	●											★	★							★											
	TNMG**334**	TNMG160416	.063		●		○	○												★							★											C018 −023 E022 E025
	TNMG**431**	TNMG220404	.016	●	●	▲	●	●	●																			●				●						
	TNMG**432**	TNMG220408	.031	●	●	▲	●	●	●											●							★	●				●						
	TNMG**433**	TNMG220412	.047	●	●	▲	●	●												★																		
	TNMG**434**	TNMG220416	.063		●	▲	●	●																														
	TNMG**542**	TNMG270608	.031		●		○	○																														
	TNMG**543**	TNMG270612	.047		●	▲	○	○																								●						
Medium Cutting	TNMG**544**	TNMG270616	.063		●	▲																															
	TNMG**666**	TNMG330924	.094			▲																										●						
MW (With Wiper)	⁎1 **TNMX332MW**	TNMX160408-MW	.031	●	●		○							▲						★																		
	⁎1 TNMX**333MW**	TNMX160412-MW	.047	●	●		○							▲						★																		
Medium Cutting																																						C018
MS	**TNMG331MS**	TNMG160404-MS	.016		●									▲	●	●						●	●	●	●	★						★						●
	TNMG**332MS**	TNMG160408-MS	.031		●	▲								▲	●	●						●	●	●	●	★	●		●								●	●
	TNMG**333MS**	TNMG160412-MS	.047		★										★	★						●	●	★	●													●
	TNMG**432MS**	TNMG220408-MS	.031		●									▲	●	●						●	●	●	●	★	●											●
Medium Cutting	TNMG**433MS**	TNMG220412-MS	.047												★							●	●															●
R/L ES	**TNMG331RES**	TNMG160404R-ES	.016											▲	★																							
	TNMG**331LES**	TNMG160404L-ES	.016											▲	★																							
	TNMG**332RES**	TNMG160408R-ES	.031											▲	★																							C018 −023 E022 E025
	TNMG**332LES**	TNMG160408L-ES	.031											▲	★																							
	TNMG**432RES**	TNMG220408R-ES	.031												★																							
Medium Cutting	TNMG**432LES**	TNMG220408L-ES	.031												★																							
R/L 2G	**TNMG331R2G**	TNMG160404R-2G	.016																								★											
	TNMG**331L2G**	TNMG160404L-2G	.016																								★											C018 −023 E022 E025
	TNMG**332R2G**	TNMG160408R-2G	.031																								★										
	TNMG**332L2G**	TNMG160408L-2G	.031																								★										
Medium Cutting																																						

⁎1 Please refer to page A032 before using the MW breaker (wiper insert).
⁎2 New design MS breaker : MP9005, MP9015, MT9015

■ = MIRACLE SIGMA

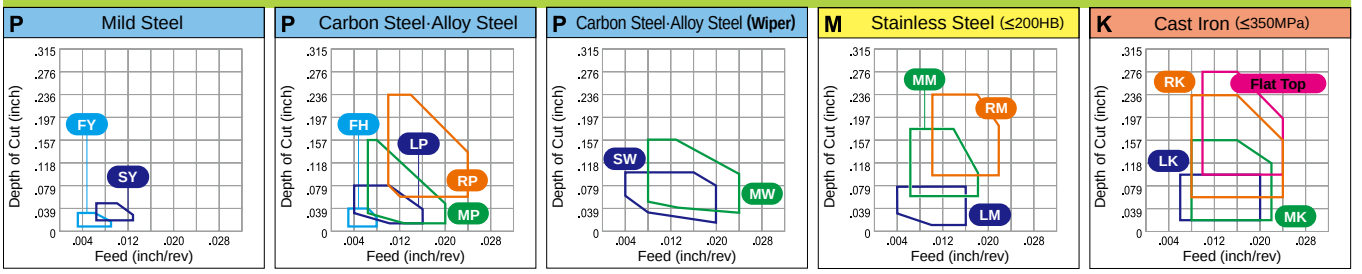
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

60° TN TYPE INSERTS WITH HOLE

TNGG 2 2 0.5 R
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ··· Rough Cutting ··· Heavy Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	UE6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
R/L	**TNGG220.5R**	TNGG110302R	.008																							★											
	TNGG**220.5L**	TNGG110302L	.008																							★	★										
	TNGG**221R**	TNGG110304R	.016																							★	★										
	TNGG**221L**	TNGG110304L	.016																							★	★										
	TNGG**222R**	TNGG110308R	.031																								★										
	TNGG**222L**	TNGG110308L	.031																							★	★										
	TNGG**321R**	TNGG160304R	.016																							★	★				★						
	TNGG**321L**	TNGG160304L	.016																							★	★										
	TNGG**330.5R**	TNGG160402R	.008																							★	★	●			★		★				C018 −023 E022 E025
	TNGG**330.5L**	TNGG160402L	.008																							★	★	●									
	TNGG**331R**	TNGG160404R	.016																							★	●	●			★	★	★				
	TNGG**331L**	TNGG160404L	.016																							★	●	●			★		★				
	TNGG**332R**	TNGG160408R	.031																							★	●	●			★	★	★				
	TNGG**332L**	TNGG160408L	.031																							★	●	●			★	★	★				
	TNGG**431R**	TNGG220404R	.016																							★	●				★						
	TNGG**431L**	TNGG220404L	.016																							★	●				★						
Medium Cutting	TNGG**432R**	TNGG220408R	.031																							★	●				★						
	TNGG**432L**	TNGG220408L	.031																							★	●				★						
RP	**TNMG332RP**	TNMG160408-RP	.031	●	●		●	●																													
	TNMG**333RP**	TNMG160412-RP	.047	●	●		●	●																													
	TNMG**432RP**	TNMG220408-RP	.031	●	●		●	●																													C018 −023 E022 E025
	TNMG**433RP**	TNMG220412-RP	.047	●	●		●	●																													
	TNMG**434RP**	TNMG220416-RP	.063	●	●		●	●																													
Rough Cutting	TNMG**543RP**	TNMG270612-RP	.047	●	●		●	●																													
	TNMG**544RP**	TNMG270616-RP	.063	●	●		●	●																													
RM	**TNMG332RM**	TNMG160408-RM	.031								●	●	●																								
	TNMG**333RM**	TNMG160412-RM	.047								●	●	●																								C018 −023 E022 E025
	TNMG**432RM**	TNMG220408-RM	.031								●	●	●																								
	TNMG**433RM**	TNMG220412-RM	.047								●	●	●																								
Rough Cutting	TNMG**434RM**	TNMG220416-RM	.063								●	●	●																								

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◔ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																				Cermet		Coated Cermet			Carbide							Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	
(NEW) RK	TNMG332RK	TNMG160408-RK	.031														●	●																			
	TNMG333RK	TNMG160412-RK	.047														●	●																			
	TNMG334RK	TNMG160416-RK	.063														●	●																			C018 −023 E022 E025
	TNMG432RK	TNMG220408-RK	.031														●	●																			
	TNMG433RK	TNMG220412-RK	.047														●	●																			
Rough Cutting	TNMG434RK	TNMG220416-RK	.063														●	●																			
(NEW) RS	TNMG332RS	TNMG160408-RS	.031																			●														●	
	TNMG333RS	TNMG160412-RS	.047																			●														●	C018 −023 E022 E025
	TNMG432RS	TNMG220408-RS	.031																			●														●	
Rough Cutting	TNMG433RS	TNMG220412-RS	.047																			●														●	
GH	TNMG332GH	TNMG160408-GH	.031	●	●	▲								▲	●				●	●																	
	TNMG333GH	TNMG160412-GH	.047	★	★														●																		
	TNMG432GH	TNMG220408-GH	.031	●	●	▲									●				●																		
	TNMG433GH	TNMG220412-GH	.047	●	●	▲									●				●	●																	C018 −023 E022 E025
	TNMG434GH	TNMG220416-GH	.063	●	●																																
	TNMG543GH	TNMG270612-GH	.047	●	●	▲			●						●																						
Rough Cutting	TNMG544GH	TNMG270616-GH	.063	●	●																																
	TNMG666GH	TNMG330924-GH	.094						●						●																						
HZ	TNMM332HZ	TNMM160408-HZ	.031		★	▲																															
	TNMM432HZ	TNMM220408-HZ	.031		●	▲																															C018 −023 E022 E025
	TNMM433HZ	TNMM220412-HZ	.047		●	▲																															
Heavy Cutting	TNMM434HZ	TNMM220416-HZ	.063		●	▲																															
Flat Top	TNMA331	TNMA160404	.016														●	●	●	●													★	★			
	TNMA332	TNMA160408	.031														●	●	●	●												★	★	●			
	TNMA333	TNMA160412	.047														●	●	●	●																	
	TNMA334	TNMA160416	.063														●	●		★																	C018 −023 E022 E025
	TNMA431	TNMA220404	.016																														★				
	TNMA432	TNMA220408	.031														●	●	●	●						★					★		●			
	TNMA433	TNMA220412	.047														●	●	●	●																	
	TNMA434	TNMA220416	.063														●	●	●	●												●					
Flat Top	TNGA221	TNGA110304	.016																														★				
	TNGA222	TNGA110308	.031																							★							★				
	TNGA330.5	TNGA160402	.008																							★							★				C018 −023 E022 E025
	TNGA331	TNGA160404	.016																												★	★	★				
	TNGA332	TNGA160408	.031																														★	★			
	TNGA431	TNGA220404	.016																												★						
	TNGA432	TNGA220408	.031																														★				

■ = MIRACLE SIGMA

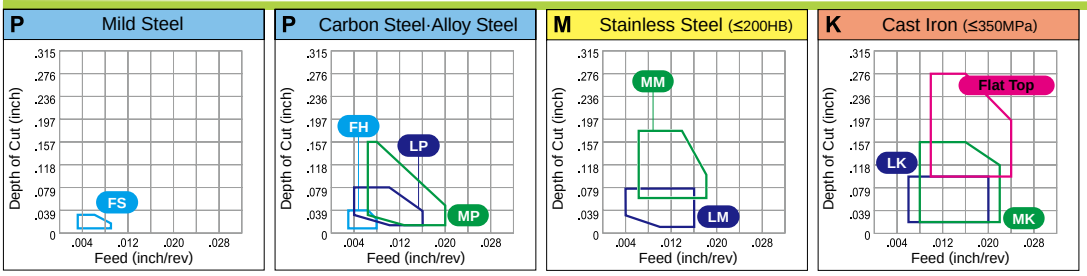
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

35° VN TYPE INSERTS WITH HOLE

VNMG 3 3 0.5 FH
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✲ Unstable Cutting

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated UE6105	UE6110	UE6020	UE6015 NEW	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 NEW	MC5015 NEW	UC5105	UC5115	MP9005 NEW	MP9015 NEW	VP05RT	VP10RT	VP15TF	UP20M	Cermet NX2525	NX3035	Coated Cermet MP3025	AP25N	VP25N	Carbide UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 NEW	Applicable Holder Page
FH	**VNMG330.5FH**	VNMG160402-FH	.008		●▲																					●●		●									
	VNMG**331FH**	VNMG160404-FH	.016		★▲																					★		●★									C024 C025 E023 E026
	VNMG**332FH**	VNMG160408-FH	.031		★▲																					★●		●★									
Finish Cutting																																					
FS	**VNMG331FS**	VNMG160404-FS	.016		▲																					★		●									
	VNMG**332FS**	VNMG160408-FS	.031		▲																					★		●									C024 C025 E023 E026
Finish Cutting																																					
FJ	**VNGG33V5FJ**	VNGG1604V5-FJ	.002																					●												●	
	VNGG**330.2FJ**	VNGG160401-FJ	.004																					●												●	C024 C025 E023 E026
	VNGG**330.5FJ**	VNGG160402-FJ	.008																					●												●	
Finish Cutting																																					
R/L F	**VNGG330.5RF**	VNGG160402R-F	.008																						●	●●		●									
	VNGG**330.5LF**	VNGG160402L-F	.008																						●	●●		●									C024 C025 E023 E026
	VNGG**331RF**	VNGG160404R-F	.016																						●	●●		●									
	VNGG**331LF**	VNGG160404L-F	.016																						●	●●		●									
Finish Cutting																																					
LP	**VNMG331LP**	VNMG160404-LP	.016	●●		●●																						●									
	VNMG**332LP**	VNMG160408-LP	.031	●●		●●																						●									C024 C025 E023 E026
Light Cutting																																					
LM	**VNMG331LM**	VNMG160404-LM	.016								●●																										
	VNMG**332LM**	VNMG160408-LM	.031								●●																										C024 C025 E023 E026
Light Cutting																																					

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																			Cermet		Coated Cermet			Carbide						Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	
(NEW) LK	**VNMG331LK**	VNMG160404-LK	.016													●	●																			
	VNMG332LK	VNMG160408-LK	.031													●	●																			C024 –025 E023 E026
Light Cutting																																				
(NEW) LS	**VNMG331LS**	VNMG160404-LS	.016																		●	●														●	
	VNMG332LS	VNMG160408-LS	.031																		●	●														●	C024 –025 E023 E026
Light Cutting																																				
SH	**VNMG331SH**	VNMG160404-SH	.016	●	★	▲	●	●																		★	●		★							
	VNMG332SH	VNMG160408-SH	.031	●	★	▲	●	●																		★	●		★							C024 C025 E023 E026
Light Cutting																																				
(NEW) SA	**VNMG331SA**	VNMG160404-SA	.016				○	○																												
	VNMG332SA	VNMG160408-SA	.031				○	○																												C024 –026 E023 E026
Light Cutting																																				
MJ	**VNMG331MJ**	VNMG160404-MJ	.016												★								●	●											●	
	VNMG332MJ	VNMG160408-MJ	.031												★								●	●											●	C024 –025 E023 E026
	VNMG333MJ	VNMG160412-MJ	.047												★								★	★												
Light Cutting																																				
MJ	**VNGM331MJ**	VNGM160404-MJ	.016																				●												●	
	VNGM332MJ	VNGM160408-MJ	.031																				●												●	C024 –026 E023 E026
	VNGM431MJ	VNGM220404-MJ	.016																				●												●	
	VNGM432MJ	VNGM220408-MJ	.031																				●												●	
Light Cutting																																				
MP	**VNMG331MP**	VNMG160404-MP	.016	●	●	▲	●	●											●									●								
	VNMG332MP	VNMG160408-MP	.031	●	●	▲	●	●											●									●								C024 –025 E023 E026
	VNMG333MP	VNMG160412-MP	.047	●	●	▲	●	●											●																	
Medium Cutting																																				
MM	**VNMG332MM**	VNMG160408-MM	.031								●	●	●																							C024 –025 E023 E026
Medium Cutting																																				

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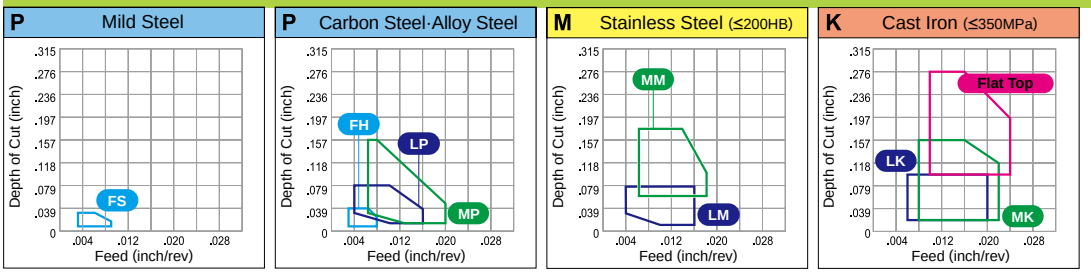
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

35° VN TYPE INSERTS WITH HOLE

VNMG 3 3 1 MK
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✲ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	UE6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
(NEW) MK	VNMG331MK	VNMG160404-MK	.016														●	●																				
	VNMG332MK	VNMG160408-MK	.031														●	●																				C024 C025 E023 E026
	VNMG333MK	VNMG160412-MK	.047														●	●																				
Medium Cutting																																						
(NEW) GK	VNMG331GK	VNMG160404-GK	.016														●	●																				
	VNMG332GK	VNMG160408-GK	.031														●	●																				C024 C025 E023 E026
Medium Cutting																																						
GM	VNMG331GM	VNMG160404-GM	.016								●	●	●																								
	VNMG332GM	VNMG160408-GM	.031								●	●	●																								C024 C025 E023 E026
Medium Cutting																																						
MA	VNMG331MA	VNMG160404-MA	.016	●	●	▲	●	●			●	●	▲	●			●	●	●	●					●												
	VNMG332MA	VNMG160408-MA	.031	●	●	▲	●	●	●		●	●	▲	●			●	●	●	●					●												C024 C025 E023 E026
Medium Cutting																																						
MH	VNMG331MH	VNMG160404-MH	.016	●	●	▲													●																		
	VNMG332MH	VNMG160408-MH	.031	●	●	▲	●	●						▲					●																		C024 C025 E023 E026
Medium Cutting																																						
Standard	VNMG331	VNMG160404	.016	●	●	▲	●	●											★	★					●		★	●	●			●		●				
	VNMG332	VNMG160408	.031	●	●	▲	●	●											★	●					●		★	●	●	●		●		●				C024 C025 E023 E026
	VNMG333	VNMG160412	.047	★	●		○	○											★	★							★											
Medium Cutting																																						

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																		Cermet		Coated Cermet			Carbide						Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	
MS	**VNMG331MS**	VNMG160404-MS	.016	●								▲	●	●					●	●	●	●		★										●	
	VNMG**332MS**	VNMG160408-MS	.031	●								▲	●	●					●	●	★	●				●								●	●	C024 C025 E023 E026
Medium Cutting																																			
R/L	**VNGG331R**	VNGG160404R	.016																						★	●				★		★			
	VNGG**331L**	VNGG160404L	.016																						★	●				★					C024 C025 E023 E026
Medium Cutting																																			
Flat Top	**VNGA331**	VNGA160404	.016																													★	●		
	VNGA**332**	VNGA160408	.031																													★	●			C024 C025 E023 E026

*New design MS breaker : MP9005, MP9015, MT9015

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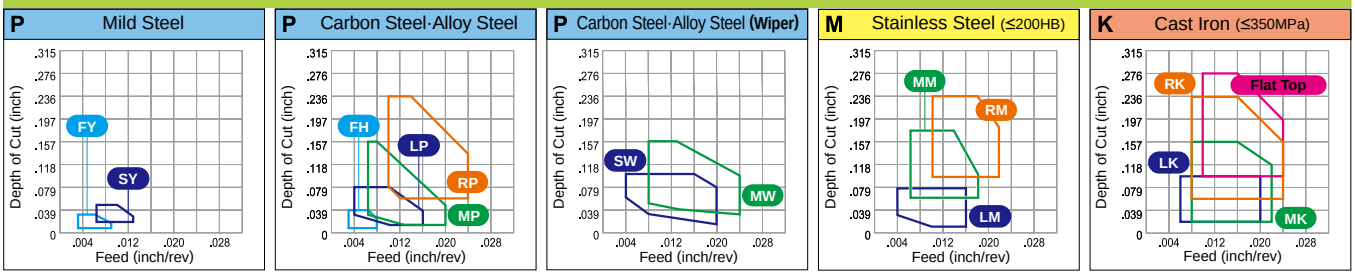
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

80° WN TYPE INSERTS WITH HOLE

WNMG 4 3 1 FH
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																				Cermet		Coated Cermet			Carbide						Applicable Holder Page
				UE6105	UE6110	UE6020	UE6015 NEW	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 NEW	MC5015 NEW	UC5105	UC5115	MP9005 NEW	MP9015 NEW	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 NEW	
FH	**WNMG431FH**	WNMG080404-FH	.016	●																				★		●										
Finish Cutting	WNMG**432FH**	WNMG080408-FH	.031	●																				★		●	●									C027 E023 E026 E027
FS	**WNMG431FS**	WNMG080404-FS	.016		▲																			★												
Finish Cutting	WNMG**432FS**	WNMG080404-FS	.031		▲																			★												C027 E023 E026 E027
FY	**WNMG431FY**	WNMG080404-FY	.016																							●										
Finish Cutting	WNMG**432FY**	WNMG080404-FY	.031		▲																					●		★								C027 E023 E026 E027
LP	**WNMG331LP**	WNMG060404-LP	.016	●	●		●	●																		●										
	WNMG**332LP**	WNMG060408-LP	.031	●	●		●	●																		●										
	WNMG**32.51LP**	WNMG06T304-LP	.016	●	●		●	●																		●										C027 E023 E026 E027
	WNMG**32.52LP**	WNMG06T308-LP	.031	●	●		●	●																		●										
	WNMG**431LP**	WNMG080404-LP	.016	●	●		●	●																		●										
Light Cutting	WNMG**432LP**	WNMG080408-LP	.031	●	●		●	●																		●										
	WNMG**433LP**	WNMG080412-LP	.047	●	●		●	●																												
LM	**WNMG331LM**	WNMG060404-LM	.016								●	●	●																							
	WNMG**332LM**	WNMG060408-LM	.031								●	●	●																							
	WNMG**431LM**	WNMG080404-LM	.016								●	●	●																							
Light Cutting	WNMG**432LM**	WNMG080408-LM	.031								●	●	●																							
NEW **LK**	**WNMG431LK**	WNMG080404-LK	.016														●	●																		
	WNMG**432LK**	WNMG080408-LK	.031														●	●																		C027 E023 E026 E027
Light Cutting	WNMG**433LK**	WNMG080412-LK	.047														●	●																		

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																				Cermet		Coated Cermet			Carbide						Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	
(NEW) LS	**WNMG431LS**	WNMG080404-LS	.016																	●	●														●	
	WNMG432LS	WNMG080408-LS	.031																	●	●														●	C027 E023 E026 E027
Light Cutting																																				
SH	**WNMG32.51SH**	WNMG06T304-SH	.016	●	●										●																					
	WNMG32.52SH	WNMG06T308-SH	.031	●	●										●																					
	WNMG331SH	WNMG060404-SH	.016	●	●										●																					C027
	WNMG332SH	WNMG060408-SH	.031	●	●										●																					E023 E026
	WNMG431SH	WNMG080404-SH	.016	●	●			●	●						●				●								★									E027
	WNMG432SH	WNMG080408-SH	.031	●	●	▲	●	●							●				●								★									
Light Cutting	**WNMG433SH**	WNMG080412-SH	.047	●	●	▲	●	●							●				★																	
SA	**WNMG431SA**	WNMG080404-SA	.016	●	●	▲	●	●							●												●									
	WNMG432SA	WNMG080408-SA	.031	●	●	▲	●	●							●												●									C027 E023 E026 E027
	WNMG433SA	WNMG080412-SA	.047	●	●	▲	●	●							●												●									
Light Cutting																																				
SW (With Wiper)	⁎**WNMG331SW**	WNMG060404-SW	.016	●	●		●							▲						●						★	●								
	⁎**WNMG332SW**	WNMG060408-SW	.031	●	●		●							▲						●						★	●								C027 E023 E026 E027
	⁎**WNMG431SW**	WNMG080404-SW	.016	●	●		●							▲						●						★	●	●							
	⁎**WNMG432SW**	WNMG080408-SW	.031	●	●		●							▲						●						★	●	●							
Light Cutting	⁎**WNMG433SW**	WNMG080412-SW	.047	●	●		●							▲												●	●	●							
SY	**WNMG431SY**	WNMG080404-SY	.016																									●								
	WNMG432SY	WNMG080408-SY	.031			▲																					●	●		★						C027 E023 E026 E027
Light Cutting																																				
C	**WNMG431C**	WNMG080404-C	.016																							★	●									
	WNMG432C	WNMG080408-C	.031																								●									C027 E023 E026 E027
Light Cutting																																				
MJ	**WNMG432MJ**	WNMG080408-MJ	.031													★							★	★												
	WNMG433MJ	WNMG080412-MJ	.047													★							★	★												C027 E023 E026 E027
Light Cutting	**WNMG434MJ**	WNMG080416-MJ	.063													★							★	★												

⁎Please refer to page A032 before using the SW breaker (wiper insert).

■ = MIRACLE SIGMA

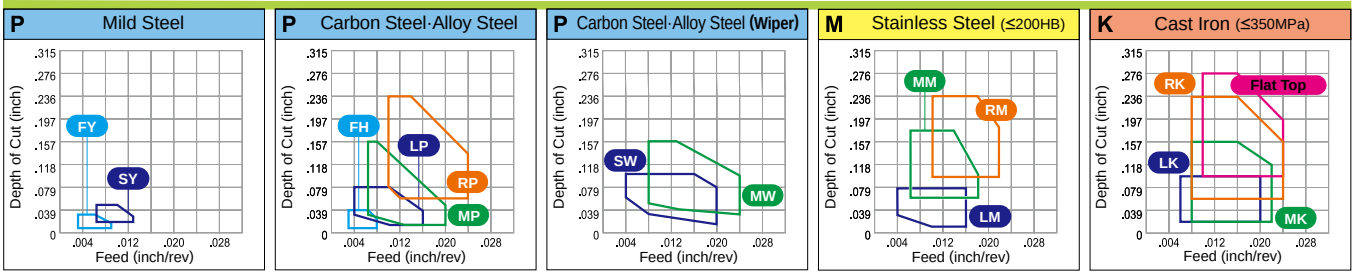
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

80° WN TYPE INSERTS WITH HOLE

WNMG 3 2.5 1 MP
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
MP	**WNMG32.51MP**	WNMG06T304-MP	.016	●	●	▲	●	●											●																		
	WNMG**32.52MP**	WNMG06T308-MP	.031	●	●	▲	●	●											●																		
	WNMG**32.53MP**	WNMG06T312-MP	.047	●	●	▲	●	●											●																		
	WNMG**331MP**	WNMG060404-MP	.016	●	●	▲	●	●											●																		
	WNMG**332MP**	WNMG060408-MP	.031	●	●	▲	●	●											●																		C027 E023 E026 E027
	WNMG**333MP**	WNMG060412-MP	.047	●	●	▲	●	●											●																		
	WNMG**431MP**	WNMG080404-MP	.016	●	●	▲	●	●											●										●								
	WNMG**432MP**	WNMG080408-MP	.031	●	●	▲	●	●											●										●								
Medium Cutting	WNMG**433MP**	WNMG080412-MP	.047	●	●	▲	●	●											●										●								
	WNMG**434MP**	WNMG080416-MP	.063	●	●	▲	●	●											●																		
MM	**WNMG332MM**	WNMG060408-MM	.031								●	●	●																								
	WNMG**333MM**	WNMG060412-MM	.047								●	●	●																								C027 E023 E026 E027
	WNMG**432MM**	WNMG080408-MM	.031								●	●	●																								
Medium Cutting	WNMG**433MM**	WNMG080412-MM	.047								●	●	●																								
NEW **MK**	**WNMG431MK**	WNMG080404-MK	.016														●	●																			
	WNMG**432MK**	WNMG080408-MK	.031														●	●																			C027 E023 E026 E027
	WNMG**433MK**	WNMG080412-MK	.047														●	●																			
Medium Cutting	WNMG**434MK**	WNMG080416-MK	.063														●	●																			
NEW **GK**	**WNMG431GK**	WNMG080404-GK	.016														●	●																			
	WNMG**432GK**	WNMG080408-GK	.031														●	●																			C027 E023 E026 E027
	WNMG**433GK**	WNMG080412-GK	.047														●	●																			
Medium Cutting																																					
GM	**WNMG331GM**	WNMG060404-GM	.016								●	●	●																								
	WNMG**332GM**	WNMG060408-GM	.031								●	●	●																								C027 E023 E026 E027
	WNMG**431GM**	WNMG080404-GM	.016								●	●	●																								
	WNMG**432GM**	WNMG080408-GM	.031								●	●	●																								
Medium Cutting	WNMG**433GM**	WNMG080412-GM	.047								●	●	●																								

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																				Cermet		Coated Cermet			Carbide						Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	
MA	**WNMG32.51MA**	WNMG06T304-MA	.016	●	●									★																					
	WNMG**32.52MA**	WNMG06T308-MA	.031	●	●									★																					
	WNMG**32.53MA**	WNMG06T312-MA	.047	★	●									★																					
	WNMG**331MA**	WNMG060404-MA	.016	●	★		○	○						●																					
	WNMG**332MA**	WNMG060408-MA	.031	●	★	▲	●	●				●	●		●										●											C027 E023 E026 E027
	WNMG**333MA**	WNMG060412-MA	.047	●	●		●	●				●	●		★										●											
	WNMG**431MA**	WNMG080404-MA	.016	●	●	▲	●	●				●	●	▲	●		●	●		●					●		●									
	WNMG**432MA**	WNMG080408-MA	.031	●	●	▲	●	●	●			●	●	▲	●		●	●	●	●					●		●									
	WNMG**433MA**	WNMG080412-MA	.047	●	●	▲	●	●	●			●	●	▲	●				●	●					●		●									
Medium Cutting	WNMG**434MA**	WNMG080416-MA	.063	★	★														●																	
	WNMG**543MA**	WNMG100612-MA	.047			▲			●																											
MH	**WNMG431MH**	WNMG080404-MH	.016	●	●	▲																														
	WNMG**432MH**	WNMG080408-MH	.031	●	●	▲	●	●	●					▲					●																	C027 E023 E026 E027
Medium Cutting	WNMG**433MH**	WNMG080412-MH	.047	●	●	▲	●	●	●										●																	
Standard	**WNMG431**	WNMG080404	.016	●	●	▲	●	●											●	●						★	●									
	WNMG**432**	WNMG080408	.031	●	●	▲	●	●											●	●					●	★	●			★					C027 E023 E026 E027
	WNMG**433**	WNMG080412	.047	●	●	▲	●	●											●	●					●					★					
Medium Cutting	WNMG**434**	WNMG080416	.063																	★															
MW (With Wiper)	✶1 **WNMG332MW**	WNMG060408-MW	.031	●	●	▲	●	●											●	●																
	✶1 WNMG**333MW**	WNMG060412-MW	.047	●	★		●	●											●	●																C027 E023 E026 E027
	✶1 WNMG**432MW**	WNMG080408-MW	.031	●	●	▲	●	●						▲					●	●															
Medium Cutting	✶1 WNMG**433MW**	WNMG080412-MW	.047	●	●		●	●						▲					●	●																
MS	**WNMG322MS**	WNMG060308-MS	.031												●																					
	WNMG**32.51MS**	WNMG06T304-MS	.016		●									▲	●																					
	WNMG**32.52MS**	WNMG06T308-MS	.031		●									▲	●																					
	WNMG**331MS**	WNMG060404-MS	.016		●									▲	●																					C027 E023 E026 E027
	WNMG**332MS**	WNMG060408-MS	.031		●									▲	●																					
	WNMG**431MS**	WNMG080404-MS	.016		●	▲								▲	●						●	●	●	●	●											●
Medium Cutting	WNMG**432MS**	WNMG080408-MS	.031		●	▲								▲	●	●					●	●	●	●	●										●	●
	WNMG**433MS**	WNMG080412-MS	.047		★										●	●					●	●	★	●												●
RP	**WNMG432RP**	WNMG080408-RP	.031	●	●		●	●																												
	WNMG**433RP**	WNMG080412-RP	.047	●	●		●	●																												C027 E023 E026 E027
Rough Cutting																																				

✶1 Please refer to page A032 before using the MW breaker (wiper insert).
✶2 New design MS breaker : MP9005, MP9015, MT9015

■ = MIRACLE SIGMA

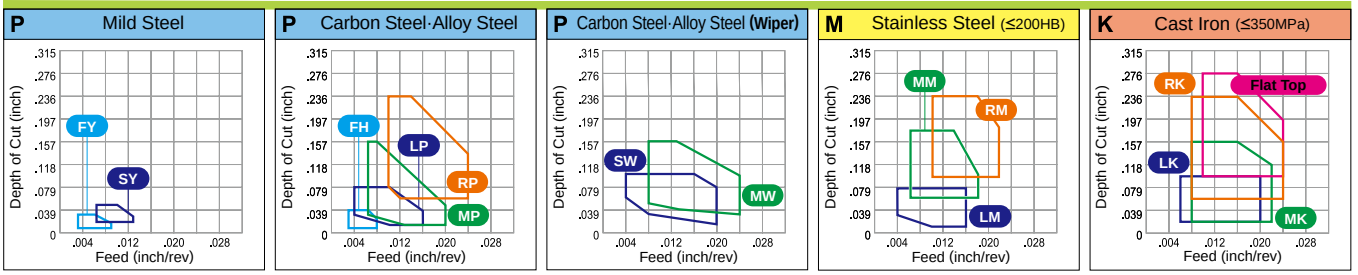
CHIP BREAKER ➤ A046
IDENTIFICATION ➤ A002

80° WN TYPE INSERTS WITH HOLE

WNMG 3 3 2 RM
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	UE6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
RM	**WNMG332RM**	WNMG060408-RM	.031								●	●	●																								
	WNMG**333RM**	WNMG060412-RM	.047								●	●	●																								C027 E023 E026 E027
Rough Cutting	WNMG**432RM**	WNMG080408-RM	.031								●	●	●																								
	WNMG**433RM**	WNMG080412-RM	.047								●	●	●																								
NEW RK	**WNMG432RK**	WNMG080408-RK	.031													●	●																				
	WNMG**433RK**	WNMG080412-RK	.047													●	●																				C027 E023 E026 E027
Rough Cutting	WNMG**434RK**	WNMG080416-RK	.063													●	●																				
NEW RS	**WNMG432RS**	WNMG080408-RS	.031																		●															●	
	WNMG**433RS**	WNMG080412-RS	.047																		●															●	C027 E023 E026 E027
Rough Cutting	WNMG**434RS**	WNMG080416-RS	.063																		●															●	
	WNMG**543RS**	WNMG100612-RS	.047																		●															●	
GH	**WNMG432GH**	WNMG080408-GH	.031	●	●	▲		●					▲	●					●	●																	
	WNMG**433GH**	WNMG080412-GH	.047	●	●	▲								●					●	●																	C027 E023 E026 E027
Rough Cutting																																					
GJ	**WNMG432GJ**	WNMG080408-GJ	.031													●							●													●	
	WNMG**433GJ**	WNMG080412-GJ	.047													●							●													●	C027 E023 E026 E027
Rough Cutting	WNMG**434GJ**	WNMG080416-GJ	.063													●							●													●	
	WNMG**543GJ**	WNMG100612-GJ	.047																				●													●	
Flat Top	**WNMA431**	WNMA080404	.016														●	●	●	●														★			
	WNMA**432**	WNMA080408	.031														●	●	●	●														★			C027 E023 E026 E027
	WNMA**433**	WNMA080412	.047														●	●	●	●																	
	WNMA**434**	WNMA080416	.063														●	●		★																	

■ = MIRACLE SIGMA

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

CHIP BREAKER ➤ A046

55° KN TYPE INSERTS WITHOUT HOLE

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	●◕✠◕✠✠✠ ◯◕✠◯✠ ●◕✠◕ ◕✠✠ ●◕ ●◕✠ ✠
M	Stainless Steel	◯◯✠◯✠ ◕✠✠ ◯ ◯◯✠
K	Cast Iron	◕✠ ●◕ ●◕ ◕✠ ● ●● ✠●●
N	Non-Ferrous Metal	◕ ●
S	Heat-resistant Alloy, Titanium Alloy	● ◕ ◕ ◕ ◕ ◕ ◕

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																				Cermet		Coated Cermet			Carbide					Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	
M1	**KNUX160405RM1**	KNUX160405R-M1	.020		▲																									●					–
Rough Cutting																																				

CHIP BREAKER ➤ A072
IDENTIFICATION ➤ A002

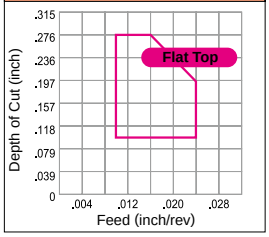
90° SN TYPE INSERTS WITHOUT HOLE

SNMN 4 3 2
Size Thickness Corner Radius
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Heavy Cutting ···

K Cast Iron (≤350MPa)



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✲ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
Flat Top	**SNMN432**	SNMN120408	.031																★	★							★					★		★				
	SNMN**433**	SNMN120412	.047																●	●							★					★						
	SNMN**434**	SNMN120416	.063																●	●																		–
	SNMN**633**	SNMN190412	.047																													★						
Flat Top	**SNG322**	SNGN090308	.031																															★				
	SNG**431**	SNGN120404	.016																													★		★				
	SNG**432**	SNGN120408	.031																													★						–

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

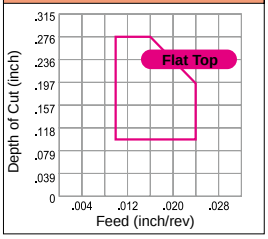
60° TN TYPE INSERTS WITHOUT HOLE

TNMN 3 2 2
Size Thickness Corner Radius
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Heavy Cutting ···

K Cast Iron (≤350MPa)



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✲ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	MP9005 (NEW)	MP9015 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9015 (NEW)	Applicable Holder Page
Flat Top	TNMN322	TNMN160308	.031																							★												
	TNMN332	TNMN160408	.031																★	★						★												
	TNMN333	TNMN160412	.047																★	★																		
	TNMN334	TNMN160416	.063																★	★																		–
	TNMN335	TNMN160420	.079																	★																		
	TNMN432	TNMN220408	.031																							★												
	TNMN433	TNMN220412	.047																												★						
Flat Top	TNG221	TNGN110304	.016																														★				
	TNG222	TNGN110308	.031																														★				
	TNG331	TNGN160404	.016																														★				–
	TNG332	TNGN160408	.031																														★				

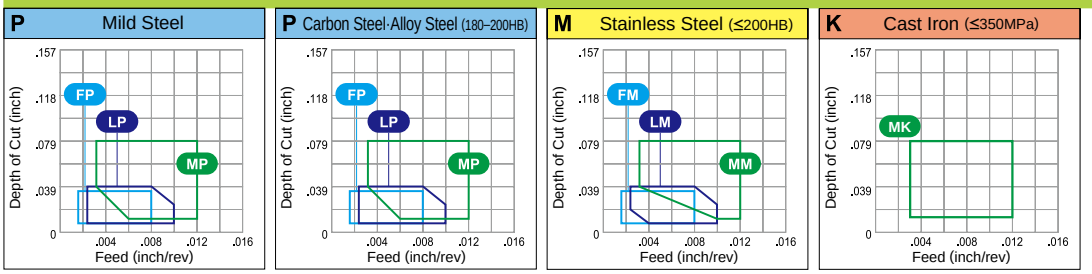
CHIP BREAKER ➤ A072
IDENTIFICATION ➤ A002

80° CC TYPE INSERTS WITH HOLE

CCMT 2 1.5 0.5 FP
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	● ◐ ✠ ◐ ✠ ✠
M	Stainless Steel	◐ ✠ ○ ✠
K	Cast Iron	◐ ✠ ● ◐
N	Non-Ferrous Metal	◐ ✠
S	Heat-resistant Alloy, Titanium Alloy	● ◐ ✠

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
FP	**CCMT21.50.5FP**	CCMT060202-FP	.008	●			●	●															●		●									
	CCMT**21.51FP**	CCMT060204-FP	.016	●			●	●															●		●									C030 D008 D012 E012 E013
	CCMT**32.50.5FP**	CCMT09T302-FP	.008	●			●	●															●		●									
	CCMT**32.51FP**	CCMT09T304-FP	.016	●			●	●															●		●									
Finish Cutting	CCMT**32.52FP**	CCMT09T308-FP	.031	●			●	●															●		●									
FM	**CCMT21.50.5FM**	CCMT060202-FM	.008																		●													
	CCMT**21.51FM**	CCMT060204-FM	.016																		●													C030 D008 D012 E012 E013
	CCMT**32.50.5FM**	CCMT09T302-FM	.008																		●													
	CCMT**32.51FM**	CCMT09T304-FM	.016																		●													
Finish Cutting	CCMT**32.52FM**	CCMT09T308-FM	.031																		●													
FV	**CCMT21.50.5FV**	CCMT060202-FV	.008			▲															●		★	●		●		★						
	CCMT**21.51FV**	CCMT060204-FV	.016			▲															●		★	●		●		★						C030 D008 D012 E012 E013
	CCMT**32.50.5FV**	CCMT09T302-FV	.008			▲																	●	●				●						
	CCMT**32.51FV**	CCMT09T304-FV	.016			▲																	★	●		●		★						
Finish Cutting	CCMT**32.52FV**	CCMT09T308-FV	.031			▲																	★	●		●		★						
FJ	**CCGT21.5V5FJ**	CCGT0602V5-FJ	.002																	●														
	CCGT**21.50.2FJ**	CCGT060201-FJ	.004																	●														
	CCGT**21.50.5FJ**	CCGT060202-FJ	.008																	●														C030 D008 D012 E012 E013
	CCGT**32.5V5FJ**	CCGT09T3V5-FJ	.002																	●														
	CCGT**32.50.2FJ**	CCGT09T301-FJ	.004																	●													★	
	CCGT**32.50.5FJ**	CCGT09T302-FJ	.008																	●													★	
Finish Cutting	CCGT**32.51FJ**	CCGT09T304-FJ	.016																	●													★	
FJ-P	**CCGT21.5V5FJ-P**	CCGT0602V5-FJ-P	.002																														●	
	CCGT**21.50.2FJ-P**	CCGT060201-FJ-P	.004																														●	
	CCGT**21.50.5FJ-P**	CCGT060202-FJ-P	.008																														●	C030 D008 D012 E012 E013
	CCGT**32.5V5FJ-P**	CCGT09T3V5-FJ-P	.002																														●	
	CCGT**32.50.2FJ-P**	CCGT09T301-FJ-P	.004																														●	
	CCGT**32.50.5FJ-P**	CCGT09T302-FJ-P	.008																														●	
Finish Cutting	CCGT**32.51FJ-P**	CCGT09T304-FJ-P	.016																														●	

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	● ◐ ✣ ◐ ✣ ✣
M	Stainless Steel	◐ ✣ ● ✣
K	Cast Iron	● ✣ ● ◐ ◐ ✣ ● ✣ ✣ ● ◐ ◐ ● ◐ ✣
N	Non-Ferrous Metal	✣ ● ◐
S	Heat-resistant Alloy, Titanium Alloy	● ◐ ✣ ● ◐ ◐

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
AZ	**CCGT21.50.5AZ**	CCGT060202-AZ	.008																											●			
	CCGT**21.51AZ**	CCGT060204-AZ	.016																											●			
	CCGT**32.50.5AZ**	CCGT09T302-AZ	.008																											●			
	CCGT**32.51AZ**	CCGT09T304-AZ	.016																											●			C030 D008 D012 E012 E013
	CCGT**32.52AZ**	CCGT09T308-AZ	.031																											●			
	CCGT**430.5AZ**	CCGT120402-AZ	.008																											●			
	CCGT**431AZ**	CCGT120404-AZ	.016																											●			
Medium-Finish Cutting	CCGT**432AZ**	CCGT120408-AZ	.031																											●			
L-F	**CCGT1.20.90.V3LF**	CCGT03S1V3L-F	.0012																		●		●										
	CCGT**1.20.90.2LF**	CCGT03S101L-F	.004																		●		●										
	CCGT**1.20.90.5LF**	CCGT03S102L-F	.008																		●		●		●								
	CCGT**1.20.91LF**	CCGT03S104L-F	.016																		●		★		●								E012 E029
	CCGT**1.51.10.V3LF**	CCGT04T0V3L-F	.0012																		●		●										
	CCGT**1.51.10.2LF**	CCGT04T001L-F	.004																		●		●										
	CCGT**1.51.10.5LF**	CCGT04T002L-F	.008																		●		●		●								
Finish Cutting	CCGT**1.51.11LF**	CCGT04T004L-F	.016																		●		★		●								
R/L F	**CCGH21.50.5RF**	CCGH060202R-F	.008																		●		★			★					●		
	CCGH**21.50.5LF**	CCGH060202L-F	.008																		●		★			★					●		C030 E006 E012 E013
	CCGH**21.51RF**	CCGH060204R-F	.016																		●		★			★					●		
Finish Cutting	CCGH**21.51LF**	CCGH060204L-F	.016																		●		★			★					●		
LP	**CCMT21.51LP**	CCMT060204-LP	.016	●		●	●																●		●								
	CCMT**21.52LP**	CCMT060208-LP	.031	●		●	●																●		●								C030 D008 D012 E012 E013
	CCMT**32.51LP**	CCMT09T304-LP	.016	●		●	●																●		●								
Light Cutting	CCMT**32.52LP**	CCMT09T308-LP	.031	●		●	●																●		●								
LM	**CCMT21.51LM**	CCMT060204-LM	.016							●	●										●												
	CCMT**21.52LM**	CCMT060208-LM	.031							●	●										●												C030 D008 D012 E012 E013
	CCMT**32.51LM**	CCMT09T304-LM	.016							●	●										●												
Light Cutting	CCMT**32.52LM**	CCMT09T308-LM	.031							●	●										●												
SV	**CCMH21.50.5SV**	CCMH060202-SV	.008		▲		○				▲	●									★		★	●	●			★					
	CCMH**21.51SV**	CCMH060204-SV	.016		▲		○				▲	●									★		★	●	●			★					C030 D012 E006 E012 E013
Light Cutting																																		
SW (With Wiper)	* **CCMT21.50.5SW**	CCMT060202-SW	.008	●	▲	○	○				▲												●		●		●						
	* CCMT**21.51SW**	CCMT060204-SW	.016	●	▲	○	○				▲							●						●		●		●						C030 D008 D012 E012 E013
	* CCMT**32.50.5SW**	CCMT09T302-SW	.008	●	▲	○	○				▲							●						●		●		●						
Light Cutting	* CCMT**32.51SW**	CCMT09T304-SW	.016	●	▲	○	○				▲							●						●		●		●						

*Please refer to page A032 before using the SW breaker (wiper insert).

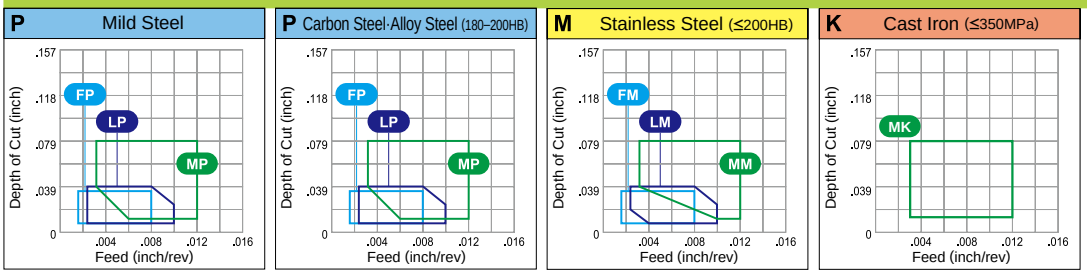
CHIP BREAKER ➤ A060
IDENTIFICATION ➤ A002

80° CC TYPE INSERTS WITH HOLE

CCGT 2 1.5 V3 RSS
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
R/L SS	**CCGT21.5V3RSS**	CCGT0602V3R-SS	.0012																		●												
	CCGT**21.5V3LSS**	CCGT0602V3L-SS	.0012																		●												
	CCGT**21.50.2RSS**	CCGT060201R-SS	.004																		●												
	CCGT**21.50.2LSS**	CCGT060201L-SS	.004																		●												
	CCGT**21.50.5RSS**	CCGT060202R-SS	.008																		●												
	CCGT**21.50.5LSS**	CCGT060202L-SS	.008																		●												
	CCGT**32.5V3RSS**	CCGT09T3V3R-SS	.0012																		●												
	CCGT**32.5V3LSS**	CCGT09T3V3L-SS	.0012																		●												
	CCGT**32.50.2RSS**	CCGT09T301R-SS	.004																		●												
	CCGT**32.50.2LSS**	CCGT09T301L-SS	.004																		●												
	CCGT**32.50.5RSS**	CCGT09T302R-SS	.008																		●												
Light Cutting	CCGT**32.50.5LSS**	CCGT09T302L-SS	.008																		●												
MJ	**CCGT21.51MJ**	CCGT060204-MJ	.016																	●													
	CCGT**32.52MJ**	CCGT09T308-MJ	.031																	●													
Light Cutting																																	
MJ-P	**CCGT21.51MJ-P**	CCGT060204-MJ-P	.016																													●	
	CCGT**32.52MJ-P**	CCGT09T308-MJ-P	.031																													●	
Light Cutting																																	
MP	**CCMT21.51MP**	CCMT060204-MP	.016		●		●	●															●		●								
	CCMT**21.52MP**	CCMT060208-MP	.031		●		●	●															●		●								
	CCMT**32.51MP**	CCMT09T304-MP	.016		●		●	●															●		●								
	CCMT**32.52MP**	CCMT09T308-MP	.031		●		●	●															●		●								
	CCMT**431MP**	CCMT120404-MP	.016		●		●	●															●		●								
	CCMT**432MP**	CCMT120408-MP	.031		●		●	●															●		●								
Medium Cutting	CCMT**433MP**	CCMT120412-MP	.047		●		●	●															●		●								

C030 D008 D012 E012 E013

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	● ◐ ✣ ◐ ✣ ✣
M	Stainless Steel	◐ ✣ ● ✣
K	Cast Iron	◐ ✣ ● ◐ ◐ ✣ ✣ ●
N	Non-Ferrous Metal	◐ ✣ ✣ ● ◐ ◐ ◐ ✣ ● ◐ ●
S	Heat-resistant Alloy, Titanium Alloy	● ◐ ✣ ◐ ◐ ✣ ✣ ● ◐ ●

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet				Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005	MC5015	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
MM	**CCMT21.51MM**	CCMT060204-MM	.016							●	●									●													
	CCMT**21.52MM**	CCMT060208-MM	.031							●	●									●													
	CCMT**32.51MM**	CCMT09T304-MM	.016							●	●									●													C030 D008 D012 E012 E013
	CCMT**32.52MM**	CCMT09T308-MM	.031							●	●									●													
	CCMT**431MM**	CCMT120404-MM	.016							●	●									●													
	CCMT**432MM**	CCMT120408-MM	.031							●	●									●													
Medium Cutting	CCMT**433MM**	CCMT120412-MM	.047							●	●									●													
NEW **MK**	**CCMT21.51MK**	CCMT060204-MK	.016												●	●																	
	CCMT**21.52MK**	CCMT060208-MK	.031												●	●																	
	CCMT**32.51MK**	CCMT09T304-MK	.016												●	●																	C030 D008 D012 E012 E013
	CCMT**32.52MK**	CCMT09T308-MK	.031												●	●																	
	CCMT**431MK**	CCMT120404-MK	.016												●	●																	
Medium Cutting	CCMT**432MK**	CCMT120408-MK	.031												●	●																	
Standard	**CCMT21.50.5**	CCMT060202	.008		●	▲						●											★	●	●	●			●		●		
	CCMT**21.51**	CCMT060204	.016	●	●	▲						●					●				●		★	●	●	●			●		●		
	CCMT**21.52**	CCMT060208	.031		●	▲						●					●				●		★						●		●		
	CCMT**2.520.5**	CCMT080302	.008		★																												
	CCMT**2.521**	CCMT080304	.016		★							●											★	●	●	●			●				C030 D008 D012 E012 E013
	CCMT**2.522**	CCMT080308	.031		★							●																	●				
	CCMT**32.50.5**	CCMT09T302	.008		●	▲						●											★	●	●	●					●		
	CCMT**32.51**	CCMT09T304	.016	●	●	▲						●					●				●		★	●	●	●			●		●		
	CCMT**32.52**	CCMT09T308	.031	●	●	▲						●					●				●		★	●	●	●			●		●		
	CCMT**431**	CCMT120404	.016	●	●	▲						●					●				●		★	●	●	●			★		●		
Medium Cutting	CCMT**432**	CCMT120408	.031	●	●	▲						●					●				●		★	●	●				●		●		
	CCMT**433**	CCMT120412	.047		●	▲						●					★							●									
MV	**CCMH21.50.5MV**	CCMH060202-MV	.008			▲		●			▲	●									★		★	●	●	●		●					
	CCMH**21.51MV**	CCMH060204-MV	.016			▲		●			▲	●									●		★	●	●	●		●					C030 E006 E012 E013
Medium Cutting																																	
MW (With Wiper)	* CCMT**21.51MW**	CCMT060204-MW	.016			▲	○	○			▲												●		●		●						
	* CCMT**21.52MW**	CCMT060208-MW	.031		●	▲	○	○			▲												●		●		●						
	* CCMT**32.51MW**	CCMT09T304-MW	.016		●	▲	○	○			▲												★		●		●						C030 D008 D012 E012 E013
	* CCMT**32.52MW**	CCMT09T308-MW	.031		●	▲	○	○			▲												●		●		●						
	* CCMT**431MW**	CCMT120404-MW	.016		●	▲	○	○			▲							●					●				●						
Medium Cutting	* CCMT**432MW**	CCMT120408-MW	.031		●	▲	○	○			▲							●					●				●						

*Please refer to page A032 before using the MW breaker (wiper insert).

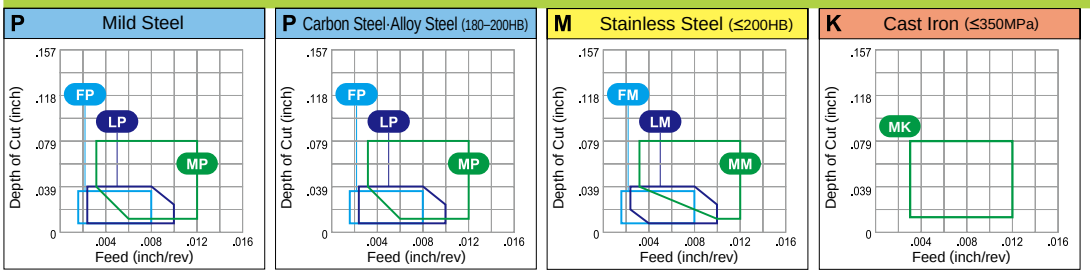
CHIP BREAKER ➤ A060
IDENTIFICATION ➤ A002

80° CC TYPE INSERTS WITH HOLE

CCET 2 1.5 V3 R SR
Size Thickness Corner Radius R/L Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet			Carbide					Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
R/L SR	CCET21.5V3RSR	CCET0602V3R-SR	.0012																	●	★								●			
	CCET21.5V3LSR	CCET0602V3L-SR	.0012																	●	★								●			
	CCET21.50.2RSR	CCET060201R-SR	.004																	●	★								●			
	CCET21.50.2LSR	CCET060201L-SR	.004																	●	★								●			
	CCET21.50.5RSR	CCET060202R-SR	.008																	●	★								●			
	CCET21.50.5LSR	CCET060202L-SR	.008																	●	★								●			
	CCET21.51RSR	CCET060204R-SR	.016																	●	★								●			C030 D008 D012 E012 E013
	CCET21.51LSR	CCET060204L-SR	.016																	●	★								●			
	CCET32.5V3RSR	CCET09T3V3R-SR	.0012																	●	★								●			
	CCET32.5V3LSR	CCET09T3V3L-SR	.0012																	●	★								●			
	CCET32.50.2RSR	CCET09T301R-SR	.004																	●	★								●			
	CCET32.50.2LSR	CCET09T301L-SR	.004																	●	★								●			
	CCET32.50.5RSR	CCET09T302R-SR	.008																	●	★								●			
	CCET32.50.5LSR	CCET09T302L-SR	.008																	●	★								●			
Medium Cutting	CCET32.51RSR	CCET09T304R-SR	.016																	●	★								●			
	CCET32.51LSR	CCET09T304L-SR	.016																	●	★								●			
R/L SN	CCET21.5V0RSN	CCET060200R-SN	0																	●	★								●			
	CCET21.5V0LSN	CCET060200L-SN	0																	●	★								●			
	CCET21.5V3RSN	CCET0602V3R-SN	.0012																	●	★								●			
	CCET21.5V3LSN	CCET0602V3L-SN	.0012																	●	★								●			
	CCET21.50.2RSN	CCET060201R-SN	.004																	●	★								●			
	CCET21.50.2LSN	CCET060201L-SN	.004																	●	★								●			
	CCET21.50.5RSN	CCET060202R-SN	.008																	●	★								●			
	CCET21.50.5LSN	CCET060202L-SN	.008																	●	★								●			
	CCET21.51RSN	CCET060204R-SN	.016																	●	★								●			
	CCET21.51LSN	CCET060204L-SN	.016																	●	★								●			
	CCET32.5V0RSN	CCET09T300R-SN	0																	●	★								●			
	CCET32.5V0LSN	CCET09T300L-SN	0																	●	★								●			
	CCET32.5V3RSN	CCET09T3V3R-SN	.0012																	●	★								●			
Medium Cutting	CCET32.5V3LSN	CCET09T3V3L-SN	.0012																	●	★								●			

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	● ◕ ✣ ◕ ✣ ✣
M	Stainless Steel	◕ ✣ ● ✣
K	Cast Iron	● ✣ ● ◕
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	●

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet				Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
R/L SN	CCET32.50.2RSN	CCET09T301R-SN	.004																	●	★								●			
	CCET32.50.2LSN	CCET09T301L-SN	.004																	●	★								●			C030 D008 D012 E012 E013
	CCET32.50.5RSN	CCET09T302R-SN	.008																	●	★								●			
	CCET32.50.5LSN	CCET09T302L-SN	.008																	●	★								●			
	CCET32.51RSN	CCET09T304R-SN	.016																	●	★								●			
Medium Cutting	CCET32.51LSN	CCET09T304L-SN	.016																	●	★								●			
R/L SN	CCGT21.5V3RSN	CCGT0602V3R-SN	.0012																	●												
	CCGT21.50.2RSN	CCGT060201R-SN	.004																	●												
	CCGT21.50.2LSN	CCGT060201L-SN	.004																	●												
	CCGT21.50.5RSN	CCGT060202R-SN	.008																	●												
	CCGT21.50.5LSN	CCGT060202L-SN	.008																	●												
	CCGT32.5V3RSN	CCGT09T3V3R-SN	.0012																	●												C030 D008 D012 E012 E013
	CCGT32.5V3LSN	CCGT09T3V3L-SN	.0012																	●												
	CCGT32.50.2RSN	CCGT09T301R-SN	.004																	●												
	CCGT32.50.2LSN	CCGT09T301L-SN	.004																	●												
	CCGT32.50.5RSN	CCGT09T302R-SN	.008																	●												
	CCGT32.50.5LSN	CCGT09T302L-SN	.008																	●												
	CCGT32.51RSN	CCGT09T304R-SN	.016																	●												
Medium Cutting	CCGT32.51LSN	CCGT09T304L-SN	.016																	●												
R/LW SN (With Wiper)	* CCET21.5V3RWSN	CCET0602V3RW-SN	.0012																	●												
	* CCET21.5V3LWSN	CCET0602V3LW-SN	.0012																	●												C030 D008 D012 E012 E013
	* CCET32.5V3RWSN	CCET09T3V3RW-SN	.0012																	●												
Medium Cutting	* CCET32.5V3LWSN	CCET09T3V3LW-SN	.0012																	●												
MSMG	CCGT21.50.5MSMG	CCGT060202M-SMG	.008																	●												
	CCGT21.51MSMG	CCGT060204M-SMG	.016																	●												C030 D008 D012 E012 E013
Medium Cutting																																
Flat Top	CCMW21.50.5	CCMW060202	.008																											★		
	CCMW21.51	CCMW060204	.016												●	●	●	●											★	★		
	CCMW32.51	CCMW09T304	.016												●	●	●	●												★		
	CCMW32.52	CCMW09T308	.031												●	●	●	●											★	★		C030 D008 D012 E012 E013
	CCMW431	CCMW120404	.016												●	●	●	●												★		
	CCMW432	CCMW120408	.031												●	●	●	●												★		
	CCMW433	CCMW120412	.047															★														
Flat Top	CCGW21.5V0	CCGW060200	0																			●										
	CCGW21.5V5	CCGW0602V5	.002																			●										C030 D008 D012 E012 E013
	CCGW32.5V0	CCGW09T300	0																			●										
	CCGW32.5V5	CCGW09T3V5	.002																			●										

*Please refer to page A032 before using the R/LW SN breaker (wiper insert).

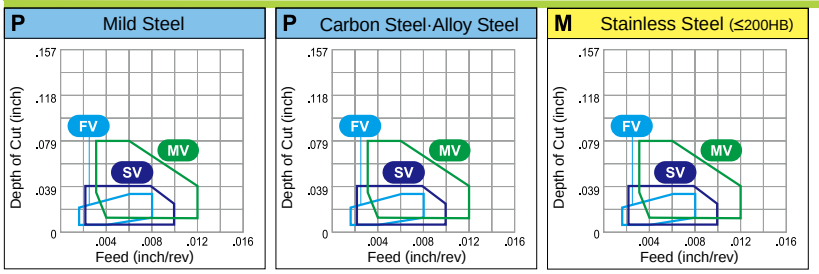
CHIP BREAKER ➤ A060
IDENTIFICATION ➤ A002

80° CP TYPE INSERTS WITH HOLE

CPMH 2.5 1.5 0.5 FV
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet			Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020 (NEW)	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	VP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
FV	**CPMH2.51.50.5FV**	CPMH080202-FV	.008		▲															●		●★		●					●			
	CPMH**2.51.51FV**	CPMH080204-FV	.016		▲															●		●★		●					●			
	CPMH**320.5FV**	CPMH090302-FV	.008		▲															●		●★		●					●			E006
	CPMH**321FV**	CPMH090304-FV	.016		▲															●		●★		●					●			
Finish Cutting	CPMH**322FV**	CPMH090308-FV	.031		▲															●		●★		●					●			
R/L F	**CPMH2.51.51RF**	CPMH080204R-F	.016																	●		★								●		
	CPMH**2.51.51LF**	CPMH080204L-F	.016																	●		★								●		
	CPMH**321RF**	CPMH090304R-F	.016																	●		★								●		E006
Finish Cutting	CPMH**321LF**	CPMH090304L-F	.016																	●		★			★					●		
R/L F	**CPGT2.51.51RF**	CPGT080204R-F	.016																			★										
	CPGT**2.51.51LF**	CPGT080204L-F	.016																			★										
	CPGT**320.5RF**	CPGT090302R-F	.008																			★										–
	CPGT**320.5LF**	CPGT090302L-F	.008																			★										
	CPGT**321RF**	CPGT090304R-F	.016																			★										
Finish Cutting	CPGT**321LF**	CPGT090304L-F	.016																			★										
SQ	**CPMT21.50.5SQ**	CPMT060202-SQ	.008										●																				
	CPMT**21.51SQ**	CPMT060204-SQ	.016	●									●																				
	CPMT**21.52SQ**	CPMT060208-SQ	.031										●																				–
	CPMT**32.50.5SQ**	CPMT09T302-SQ	.008										●																				
	CPMT**32.51SQ**	CPMT09T304-SQ	.016	●									●																				
Finish Cutting	CPMT**32.52SQ**	CPMT09T308-SQ	.031	●									●																				
Standard	**CPGT2.51.50.5**	CPGT080202	.008																											●			
	CPGT**2.51.51**	CPGT080204	.016																											●			
	CPGT**320.5**	CPGT090302	.008																											●			–
Finish Cutting	CPGT**321**	CPGT090304	.016																											●			
SV	**CPMH2.51.50.5SV**	CPMH080202-SV	.008		▲		●				▲	●								★			★	●	●			●					
	CPMH**2.51.51SV**	CPMH080204-SV	.016		▲		●				▲	●								★			★	●	●			●					
	CPMH**320.5SV**	CPMH090302-SV	.008		▲		●				▲	●								★			★	●	●			●					E006
	CPMH**321SV**	CPMH090304-SV	.016		▲		●				▲	●								★			★	●	●			●					
Light Cutting	CPMH**322SV**	CPMH090308-SV	.031		▲		●				▲	●								★			★	●	●			●					

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◔ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet				Carbide					Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005	MC5015	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
Standard	**CPMX2.51.51**	CPMX080204	.016	●																	★											
	CPMX**2.51.52**	CPMX080208	.031	●																	★											
	CPMX**321**	CPMX090304	.016	●																	★	★						★					–
	CPMX**322**	CPMX090308	.031	●	▲																★							★					
Medium Cutting																																	
MV	**CPMH2.51.51MV**	CPMH080204-MV	.016		▲		●			▲	●									●		★	●	●	●		●						
	CPMH**2.51.52MV**	CPMH080208-MV	.031		▲		●			▲	●									●		★	●	●	●		●						
	CPMH**321MV**	CPMH090304-MV	.016		▲		●			▲	●									●		★	●	●	●		●						E006
	CPMH**322MV**	CPMH090308-MV	.031		▲		●			▲	●									●		★	●	●	●		●						
Medium Cutting																																	
MQ	**CPMT21.51MQ**	CPMT060204-MQ	.016	●								●													●								
	CPMT**21.52MQ**	CPMT060208-MQ	.031	●								●													●								
	CPMT**32.51MQ**	CPMT09T304-MQ	.016	●								●													●								–
	CPMT**32.52MQ**	CPMT09T308-MQ	.031	●								●													●								
Medium Cutting																																	

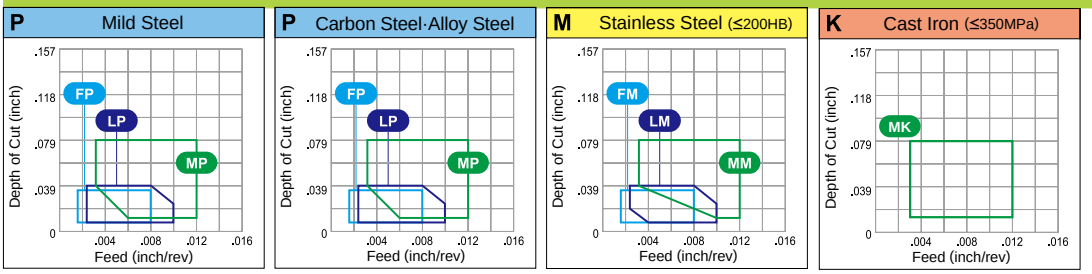
CHIP BREAKER ➤ A066
IDENTIFICATION ➤ A002

55° DC TYPE INSERTS WITH HOLE

DCMT 2 1.5 0.5 FP
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet			Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
FP	**DCMT21.50.5FP**	DCMT070202-FP	.008	●		●	●															●		●								C031
	DCMT**21.51FP**	DCMT070204-FP	.016	●		●	●															●		●								C032
	DCMT**32.50.5FP**	DCMT11T302-FP	.008	●		●	●															●		●								D009
	DCMT**32.51FP**	DCMT11T304-FP	.016	●		●	●															●		●								D013
Finish Cutting	DCMT**32.52FP**	DCMT11T308-FP	.031	●		●	●															●		●								D040
FM	**DCMT21.50.5FM**	DCMT070202-FM	.008																		●											E008
	DCMT**21.51FM**	DCMT070204-FM	.016																		●											E013
	DCMT**32.50.5FM**	DCMT11T302-FM	.008																		●											E014
	DCMT**32.51FM**	DCMT11T304-FM	.016																		●											C031
Finish Cutting	DCMT**32.52FM**	DCMT11T308-FM	.031																		●											C032
FV	**DCMT21.50.5FV**	DCMT070202-FV	.008	★	▲																●		★	●		●						D009
	DCMT**21.51FV**	DCMT070204-FV	.016	★	▲																●		★	●		●						D013
	DCMT**21.52FV**	DCMT070208-FV	.031		▲																●		●	★								D040
	DCMT**32.50.5FV**	DCMT11T302-FV	.008		▲																●		●	★								E008
	DCMT**32.51FV**	DCMT11T304-FV	.016	★	▲																●		★	●		●						E013
Finish Cutting	DCMT**32.52FV**	DCMT11T308-FV	.031	★	▲																●		★	●		●						E014
FJ	**DCGT21.5V5FJ**	DCGT0702V5-FJ	.002																	●											C031
	DCGT**21.50.2FJ**	DCGT070201-FJ	.004																	●											C032
	DCGT**21.50.5FJ**	DCGT070202-FJ	.008																	●											D009
	DCGT**32.5V5FJ**	DCGT11T3V5-FJ	.002																	●											D013
	DCGT**32.50.2FJ**	DCGT11T301-FJ	.004																	●											D040
Finish Cutting	DCGT**32.50.5FJ**	DCGT11T302-FJ	.008																	●											E008
FJ-P	**DCGT21.5V5FJ-P**	DCGT0702V5-FJ-P	.002																											●	E013
	DCGT**21.50.2FJ-P**	DCGT070201-FJ-P	.004																											●	E014
	DCGT**21.50.5FJ-P**	DCGT070202-FJ-P	.008																											●	C031
	DCGT**32.5V5FJ-P**	DCGT11T3V5-FJ-P	.002																											●	C032
	DCGT**32.50.2FJ-P**	DCGT11T301-FJ-P	.004																											●	D009
Finish Cutting	DCGT**32.50.5FJ-P**	DCGT11T302-FJ-P	.008																											●	D013
																															D040
																															E008
																															E013
																															E014

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◔ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet				Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 NEW	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 NEW	MC5015 NEW	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
AZ	**DCGT21.50.5AZ**	DCGT070202-AZ	.008																										●			C031
	DCGT**21.51AZ**	DCGT070204-AZ	.016																										●			C032 D009
	DCGT**32.50.5AZ**	DCGT11T302-AZ	.008																										●			D013 D040
Medium-Finish Cutting	DCGT**32.51AZ**	DCGT11T304-AZ	.016																										●			E008 E013
	DCGT**32.52AZ**	DCGT11T308-AZ	.031																										●			E014
R/L F	**DCGT21.50.5RF**	DCGT070202R-F	.008																	●		★							●			
	DCGT**21.50.5LF**	DCGT070202L-F	.008																	●		★			●				●			C031
	DCGT**21.51RF**	DCGT070204R-F	.016																	●		★							●			C032 D009
	DCGT**21.51LF**	DCGT070204L-F	.016																	●		★			●				●			D013
	DCGT**32.50.5RF**	DCGT11T302R-F	.008																	●		★							●			D040 E008
	DCGT**32.50.5LF**	DCGT11T302L-F	.008																	●		★			●				●			E013
Finish Cutting	DCGT**32.51RF**	DCGT11T304R-F	.016																	●		★							●			E014
	DCGT**32.51LF**	DCGT11T304L-F	.016																	●		★			●				●			
LP	**DCMT21.51LP**	DCMT070204-LP	.016	●		●	●																●		●								C031
	DCMT**21.52LP**	DCMT070208-LP	.031	●		●	●																●		●								C032 D009
	DCMT**32.51LP**	DCMT11T304-LP	.016	●		●	●																●		●								D013 D040
Light Cutting	DCMT**32.52LP**	DCMT11T308-LP	.031	●		●	●																●		●								E008 E013
																																	E014
LM	**DCMT21.51LM**	DCMT070204-LM	.016							●	●										●												C031
	DCMT**21.52LM**	DCMT070208-LM	.031							●	●										●												C032 D009
	DCMT**32.51LM**	DCMT11T304-LM	.016							●	●										●												D013 D040
Light Cutting	DCMT**32.52LM**	DCMT11T308-LM	.031							●	●										●												E008 E013
																																	E014
SV	**DCMT21.50.5SV**	DCMT070202-SV	.008		▲						▲	●									●	★	●			●							C031
	DCMT**21.51SV**	DCMT070204-SV	.016	★	▲						▲	●									●	★	●			●							C032 D009
	DCMT**21.52SV**	DCMT070208-SV	.031	★	▲						▲	●									●	★	●			●							D013
	DCMT**32.50.5SV**	DCMT11T302-SV	.008	★	▲						▲	●									●	★	●			●							D040 E008
	DCMT**32.51SV**	DCMT11T304-SV	.016	★	▲						▲	●									●	★	●			●							E013
Light Cutting	DCMT**32.52SV**	DCMT11T308-SV	.031	★	▲						▲	●									●	★	●			★							E014
R/L SS	**DCGT21.5V3RSS**	DCGT0702V3R-SS	.0012																	●												
	DCGT**21.5V3LSS**	DCGT0702V3L-SS	.0012																	●												
	DCGT**21.50.2RSS**	DCGT070201R-SS	.004																	●												C031
	DCGT**21.50.2LSS**	DCGT070201L-SS	.004																	●												C032 D009
	DCGT**21.50.5RSS**	DCGT070202R-SS	.008																	●												D013 D040
	DCGT**21.50.5LSS**	DCGT070202L-SS	.008																	●												E008 E013
	DCGT**32.5V3RSS**	DCGT11T3V3R-SS	.0012																	●												E014
	DCGT**32.50.2RSS**	DCGT11T301R-SS	.004																	●												
Light Cutting	DCGT**32.50.5RSS**	DCGT11T302R-SS	.008																	●												

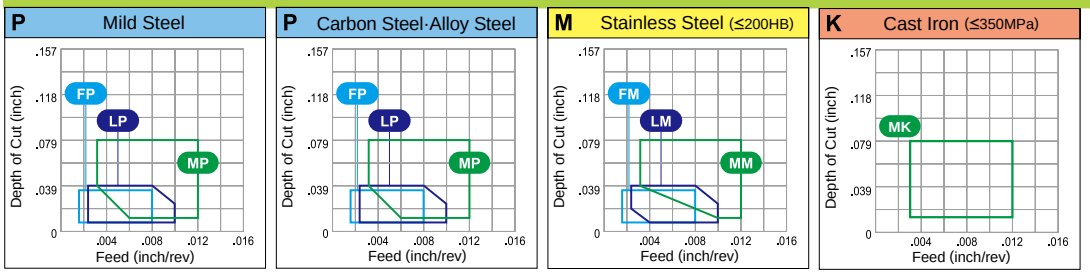
CHIP BREAKER ➤ A066
IDENTIFICATION ➤ A002

55° DC TYPE INSERTS WITH HOLE

DCGT 2 1.5 1 MJ
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
MJ	**DCGT21.51MJ**	DCGT070204-MJ	.016																	●														C031 C032 D009 D013 D040 E008 E013 E014
	**DCGT32.51MJ**	DCGT11T304-MJ	.016																	●														
	DCGT32.52MJ	DCGT11T308-MJ	.031																	●														
Light Cutting																																		
MJ-P	**DCGT21.51MJ-P**	DCGT070204-MJ-P	.016																													●		
	**DCGT32.51MJ-P**	DCGT11T304-MJ-P	.016																													●		
	DCGT32.52MJ-P	DCGT11T308-MJ-P	.031																													●		
Light Cutting																																		
MP	**DCMT21.51MP**	DCMT070204-MP	.016	●			●	●															●		●									C031 C032 D009 D013 D040 E008 E013 E014
	**DCMT21.52MP**	DCMT070208-MP	.031	●			●	●															●		●									
	DCMT32.51MP	DCMT11T304-MP	.016	●			●	●															●		●									
	DCMT32.52MP	DCMT11T308-MP	.031	●			●	●															●		●									
	DCMT431MP	DCMT150404-MP	.016	●			●	●															●		●									
	DCMT432MP	DCMT150408-MP	.031	●			●	●															●		●									
Medium Cutting																																		
MM	**DCMT21.51MM**	DCMT070204-MM	.016							●	●										●													C031 C032 D009 D013 D040 E008 E013 E014
	**DCMT21.52MM**	DCMT070208-MM	.031							●	●										●													
	DCMT32.51MM	DCMT11T304-MM	.016							●	●										●													
	DCMT32.52MM	DCMT11T308-MM	.031							●	●										●													
	DCMT431MM	DCMT150404-MM	.016							●	●										●													
	DCMT432MM	DCMT150408-MM	.031							●	●										●													
Medium Cutting																																		
NEW **MK**	**DCMT32.51MK**	DCMT11T304-MK	.016												●	●																		C031 C032 D009 D013 D040 E008 E013 E014
	**DCMT32.52MK**	DCMT11T308-MK	.031												●	●																		
Medium Cutting																																		

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
Standard	**DCMT21.50.5**	DCMT070202	.008	●	▲							●											★	●	●	●			★					
	DCMT**21.51**	DCMT070204	.016	●	●	▲						●					★				●		★	●	●	●			★					
	DCMT**21.52**	DCMT070208	.031		★							★					●						★	●	●	●								
	DCMT**32.50.5**	DCMT11T302	.008		●	▲						●											★	●	●	●			★					C031 C032 D009 D013 D040 E008 E013 E014
	DCMT**32.51**	DCMT11T304	.016	●	●	▲						●						●			●		★	●	●	●			★		●			
	DCMT**32.52**	DCMT11T308	.031	●	●	▲						●						●			●		★	●	●	●			★					
	DCMT**32.53**	DCMT11T312	.047		★																												
	DCMT**431**	DCMT150404	.016		●	▲						●						★					★	●	●	★			★					
	DCMT**432**	DCMT150408	.031		●	▲						●						★					★	●	●				★					
Medium Cutting	DCMT**433**	DCMT150412	.047		★																												
MV	**DCMT21.50.5MV**	DCMT070202-MV	.008		★	▲		●			▲	●									●		★	●	●	●		●						
	DCMT**21.51MV**	DCMT070204-MV	.016		★	▲		●			▲	●									●		★	●	●	●		★						
	DCMT**21.52MV**	DCMT070208-MV	.031		★	▲		●			▲	●									●		★	●	●	●		★						
	DCMT**32.50.5MV**	DCMT11T302-MV	.008		★	▲		●			▲	●									●		★	●	●	●		●						C031 C032 D009 D013 D040 E008 E013 E014
	DCMT**32.51MV**	DCMT11T304-MV	.016		★	▲		●			▲	●									●		★	●	●	●		●						
Medium Cutting	DCMT**32.52MV**	DCMT11T308-MV	.031		★	▲		●			▲	●									●		★	●	●	●		★						
R/L SR	**DCET21.5V3RSR**	DCET0702V3R-SR	.0012																		●		★								●		
	DCET**21.5V3LSR**	DCET0702V3L-SR	.0012																		●		★								●		
	DCET**21.50.2RSR**	DCET070201R-SR	.004																		●		★								●		
	DCET**21.50.2LSR**	DCET070201L-SR	.004																		●		★								●		
	DCET**21.50.5RSR**	DCET070202R-SR	.008																		●		★								●		
	DCET**21.50.5LSR**	DCET070202L-SR	.008																		●		★								●		
	DCET**21.51RSR**	DCET070204R-SR	.016																		●		★								●		C031 C032 D009 D013 D040 E008 E013 E014
	DCET**21.51LSR**	DCET070204L-SR	.016																		●		★								●		
	DCET**32.5V3RSR**	DCET11T3V3R-SR	.0012																		●		★								●		
	DCET**32.5V3LSR**	DCET11T3V3L-SR	.0012																		●		★								●		
	DCET**32.50.2RSR**	DCET11T301R-SR	.004																		●		★								●		
	DCET**32.50.2LSR**	DCET11T301L-SR	.004																		●		★								●		
	DCET**32.50.5RSR**	DCET11T302R-SR	.008																		●		★								●		
	DCET**32.50.5LSR**	DCET11T302L-SR	.008																		●		★								●		
	DCET**32.51RSR**	DCET11T304R-SR	.016																		●		★								●		
Medium Cutting	DCET**32.51LSR**	DCET11T304L-SR	.016																		●		★								●		
R/L SN	**DCET21.5V0RSN**	DCET070200R-SN	0																		●		★								●		
	DCET**21.5V0LSN**	DCET070200L-SN	0																		●		★								●		
	DCET**21.5V3RSN**	DCET0702V3R-SN	.0012																		●		★								●		
	DCET**21.5V3LSN**	DCET0702V3L-SN	.0012																		●		★								●		
	DCET**21.50.2RSN**	DCET070201R-SN	.004																		●		★								●		
	DCET**21.50.2LSN**	DCET070201L-SN	.004																		●		★								●		
	DCET**21.50.5RSN**	DCET070202R-SN	.008																		●		★								●		
Medium Cutting	DCET**21.50.5LSN**	DCET070202L-SN	.008																		●		★								●		

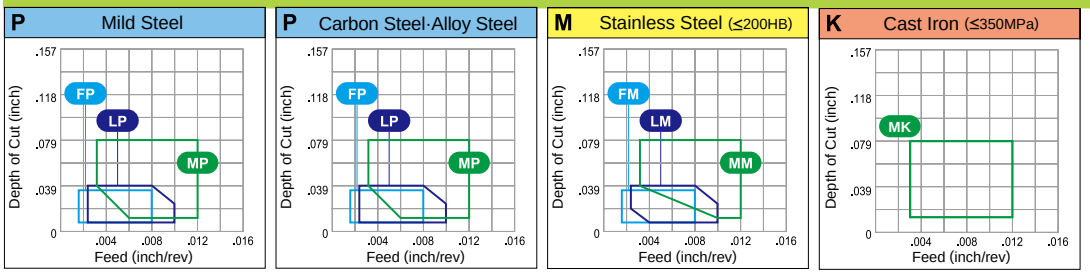
CHIP BREAKER ➤ A060
IDENTIFICATION ➤ A002

55° DC TYPE INSERTS WITH HOLE

DCET 2 1.5 1 R SN
Size Thickness Corner Radius R/L Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3335	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
R/L SN	DCET21.51RSN	DCET070204R-SN	.016																		●		★							●			
	DCET21.51LSN	DCET070204L-SN	.016																		●		★							●			
	DCET32.5V0RSN	DCET11T300R-SN	0																		●		★							●			
	DCET32.5V0LSN	DCET11T300L-SN	0																		●		★							●			
	DCET32.5V3RSN	DCET11T3V3R-SN	.0012																		●		★							●			
	DCET32.5V3LSN	DCET11T3V3L-SN	.0012																		●		★							●			
	DCET32.50.2RSN	DCET11T301R-SN	.004																		●		★							●			
	DCET32.50.2LSN	DCET11T301L-SN	.004																		●		★							●			
	DCET32.50.5RSN	DCET11T302R-SN	.008																		●		★							●			
	DCET32.50.5LSN	DCET11T302L-SN	.008																		●		★							●			
Medium Cutting	DCET32.51RSN	DCET11T304R-SN	.016																		●		★							●			
	DCET32.51LSN	DCET11T304L-SN	.016																		●		★							●			
R/L SN	DCGT21.5V3RSN	DCGT0702V3R-SN	.0012																		●													
	DCGT21.50.2RSN	DCGT070201R-SN	.004																		●													
	DCGT21.50.5RSN	DCGT070202R-SN	.008																		●													
	DCGT21.50.5LSN	DCGT070202L-SN	.008																		●													
	DCGT32.5V3RSN	DCGT11T3V3R-SN	.0012																		●													
	DCGT32.5V3LSN	DCGT11T3V3L-SN	.0012																		●													
	DCGT32.50.2RSN	DCGT11T301R-SN	.004																		●													
	DCGT32.50.2LSN	DCGT11T301L-SN	.004																		●													
	DCGT32.50.5RSN	DCGT11T302R-SN	.008																		●													
	DCGT32.50.5LSN	DCGT11T302L-SN	.008																		●													
Medium Cutting	DCGT32.51RSN	DCGT11T304R-SN	.016																		●													
	DCGT32.51LSN	DCGT11T304L-SN	.016																		●													
R/LW SN (With Wiper)	* DCET21.5V3RWSN	DCET0702V3RW-SN	.0012																		●													
	* DCET21.5V3LWSN	DCET0702V3LW-SN	.0012																		●													
	* DCET32.5V3RWSN	DCET11T3V3RW-SN	.0012																		●													
Medium Cutting	* DCET32.5V3LWSN	DCET11T3V3LW-SN	.0012																		●													

*Please refer to page A032 before using the R/LW SN breaker (wiper insert).

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet				Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005	MC5015	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
MSMG	**DCGT21.50.5MSMG**	DCGT070202M-SMG	.008																	●													C031
	DCGT**21.51MSMG**	DCGT070204M-SMG	.016																	●													C032 D009
	DCGT**32.50.5MSMG**	DCGT11T302M-SMG	.008																	●													D013 D040
	DCGT**32.51MSMG**	DCGT11T304M-SMG	.016																	●													E008 E013
Medium Cutting																																	E014
Flat Top	**DCMW21.51**	DCMW070204	.016														★	★												★			C031
	DCMW**32.51**	DCMW11T304	.016												●	●	★	★											●	★			C032 D009
	DCMW**32.52**	DCMW11T308	.031												●	●	★	★												★			D013 D040
	DCMW**431**	DCMW150404	.016																											★			E008
	DCMW**432**	DCMW150408	.031																											★			E013 E014
Flat Top	**DCGW21.5V0**	DCGW070200	0																			★											C031
	DCGW**21.5V5**	DCGW0702V5	.002																			★											C032 D009
	DCGW**32.5V0**	DCGW11T300	0																			★											D013 D040
	DCGW**32.5V5**	DCGW11T3V5	.002																			★											E008
																																	E013 E014

POSI 7°
WITH HOLE
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CHIP BREAKER ➤ A060
IDENTIFICATION ➤ A002

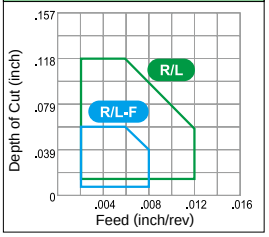
55° DE TYPE INSERTS WITH HOLE

DEGX 4 3 0.5 R F
Size Thickness Corner Radius R/L Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Medium Cutting ···

N Aluminum Alloy



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	MC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
R/L F	**DEGX430.5RF**	DEGX150402R-F	.008																											★			
	DEGX**430.5LF**	DEGX150402L-F	.008																											★			
	DEGX**431RF**	DEGX150404R-F	.016																											★			C041
	DEGX**431LF**	DEGX150404L-F	.016																											★			
Finish Cutting																																	
R/L	**DEGX430.5R**	DEGX150402R	.008																											●			
	DEGX**430.5L**	DEGX150402L	.008																											●			
	DEGX**431R**	DEGX150404R	.016																											●			C041
	DEGX**431L**	DEGX150404L	.016																											●			
Medium Cutting	DEGX**432R**	DEGX150408R	.031																											●			

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

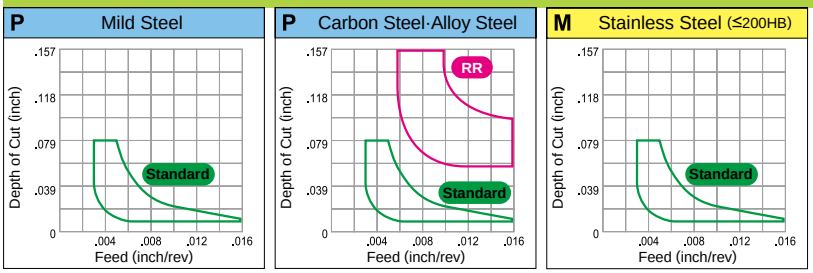
CHIP BREAKER ➤ A070

RC TYPE INSERTS WITH HOLE

RCGT 08 03 M0 AZ
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Medium Cutting ··· Heavy Cutting ···



Cutting Conditions : ● Stable Cutting ◕ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet			Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	MC6400	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	VP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
AZ	**RCGT0803M0-AZ**	RCGT0803M0-AZ	–																										●				
	RCGT**10T3M0-AZ**	RCGT10T3M0-AZ	–																										●				C033
Medium-Finish Cutting																																	
Standard	**RCMT0602M0**	RCMT0602M0	–		●																		★	●	●				★				
	RCMT**0803M0**	RCMT0803M0	–		●									★									★	●	●				★				C033
Medium Cutting																																	
Standard	**RCMX1003M0**	RCMX1003M0	–		●▲									★						★				★★	●								
	RCMX**1204M0**	RCMX1204M0	–		●●▲									●★					★	★★				★●	●								
	RCMX**1606M0**	RCMX1606M0	–		★●▲				★					★★						★★													H012
	RCMX**2006M0**	RCMX2006M0	–		★●▲				★					★																			
	RCMX**2507M0**	RCMX2507M0	–		★★▲																												
Medium Cutting	RCMX**3209M0**	RCMX3209M0	–		★★▲																												
RR	**RCMX1606M0-RR**	RCMX1606M0-RR	–		★▲				★					★																				
	RCMX**2006M0-RR**	RCMX2006M0-RR	–		★▲				★					★																				
	RCMX**2507M0-RR**	RCMX2507M0-RR	–		★▲				★					★																				–
	RCMX**3209M0-RR**	RCMX3209M0-RR	–		★▲																												
Heavy Cutting																																	

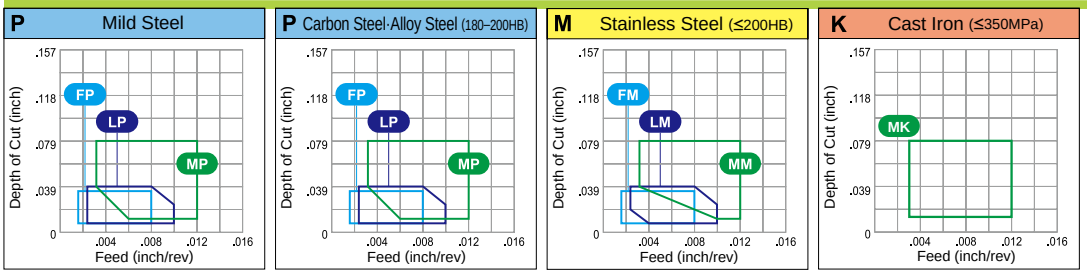
CHIP BREAKER ➤ A060
IDENTIFICATION ➤ A002

90° SC TYPE INSERTS WITH HOLE

SCMT 3 2.5 1 FP
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet			Carbide					Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
FP	**SCMT32.51FP**	SCMT09T304-FP	.016	●		●	●															●		●								
	SCMT**32.52FP**	SCMT09T308-FP	.031	●		●	●															●		●								C034 E015
Finish Cutting																																
FM	**SCMT32.51FM**	SCMT09T304-FM	.016																	●												
	SCMT**32.52FM**	SCMT09T308-FM	.031																	●												C034 E015
Finish Cutting																																
FV	**SCMT32.51FV**	SCMT09T304-FV	.016			▲																	★	●		●		★					
Finish Cutting																																C034 E015
LP	**SCMT32.51LP**	SCMT09T304-LP	.016	●		●	●															●		●								
	SCMT**32.52LP**	SCMT09T308-LP	.031	●		●	●															●		●								C034 E015
Light Cutting																																
LM	**SCMT32.51LM**	SCMT09T304-LM	.016							●	●										●											
	SCMT**32.52LM**	SCMT09T308-LM	.031							●	●										●											C034 E015
Light Cutting																																
MP	**SCMT32.51MP**	SCMT09T304-MP	.016	●		●	●															●		●								
	SCMT**32.52MP**	SCMT09T308-MP	.031	●		●	●															●		●								
	SCMT**431MP**	SCMT120404-MP	.016	●		●	●															●		●								C034 E015
	SCMT**432MP**	SCMT120408-MP	.031	●		●	●															●		●								
Medium Cutting																																

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet				Carbide					Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005	MC5015	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
MM	**SCMT32.51MM**	SCMT09T304-MM	.016							●	●									●													
	SCMT**32.52MM**	SCMT09T308-MM	.031							●	●									●													
	SCMT**431MM**	SCMT120404-MM	.016							●	●									●													C034 E015
Medium Cutting	SCMT**432MM**	SCMT120408-MM	.031							●	●									●													
NEW **MK**	**SCMT32.51MK**	SCMT09T304-MK	.016												●	●																	
	SCMT**32.52MK**	SCMT09T308-MK	.031												●	●																	
	SCMT**432MK**	SCMT120408-MK	.031												●	●																	C034 E015
Medium Cutting																																	
Standard	**SCMT32.51**	SCMT09T304	.016	★	●	▲						●					●					★	●	●	●			●					
	SCMT**32.52**	SCMT09T308	.031	●	●	▲						●					●					★	●	●	●			★					
	SCMT**431**	SCMT120404	.016	★	●	▲						●					★					★	●	●									C034 E015
	SCMT**432**	SCMT120408	.031	●	●	▲						●					★					★	●	●	●			★					
Medium Cutting	SCMT**433**	SCMT120412	.047		★																												
Flat Top	**SCMW32.51**	SCMW09T304	.016												●	●		★											★		★		
	SCMW**32.52**	SCMW09T308	.031												●	●	★	★															
	SCMW**432**	SCMW120408	.031												●	●	★	★															C034 E015

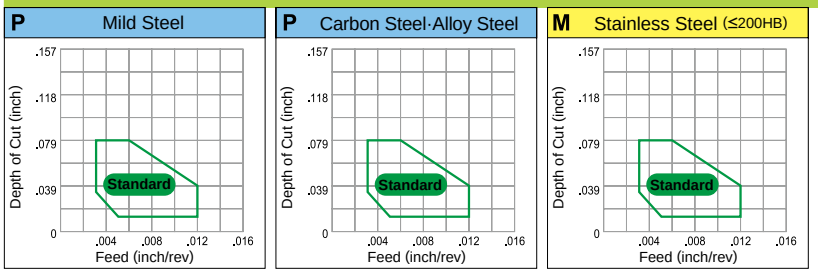
CHIP BREAKER ➤ A060
IDENTIFICATION ➤ A002

90° SP TYPE INSERTS WITH HOLE

SPMT 3 2 1
Size Thickness Corner Radius
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Medium Cutting



Cutting Conditions : ● Stable Cutting ◕ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
Standard	**SPMT321**	SPMT090304	.016																				★											
	SPMT**322**	SPMT090308	.031																				★											
	SPMT**422**	SPMT120308	.031																				★						★					–
Medium Cutting																																		
Flat Top	**SPMW321**	SPMW090304	.016																		● ★		★					★		★				
	SPMW**322**	SPMW090308	.031																		★ ★		★					★		★				
	SPMW**421**	SPMW120304	.016																		● ●		★					●		●				–
	SPMW**422**	SPMW120308	.031																		● ●		★					●		●				
Flat Top	**SPGX321**	SPGX090304	.016																				★							★				
	SPGX**322**	SPGX090308	.031																											★				
	SPGX**421**	SPGX120304	.016																											★				–
	SPGX**422**	SPGX120308	.031																											★				

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

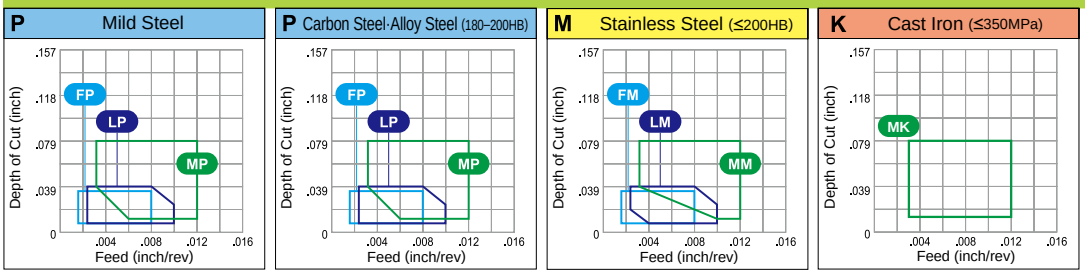
CHIP BREAKER ➤ A066

60° TC TYPE INSERTS WITH HOLE

TCMT 1.8 1.5 0.5 FP
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet			Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	VP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
FP	**TCMT1.81.50.5FP**	TCMT090202-FP	.008	●		●	●															●		●								
	TCMT**1.81.51FP**	TCMT090204-FP	.016	●		●	●															●		●								C035 E015 E016
	TCMT**21.50.5FP**	TCMT110202-FP	.008	●		●	●															●		●								
	TCMT**21.51FP**	TCMT110204-FP	.016	●		●	●															●		●								
Finish Cutting	TCMT**32.51FP**	TCMT16T304-FP	.016	●		●	●															●		●								
FM	**TCMT1.81.50.5FM**	TCMT090202-FM	.008																		●											
	TCMT**1.81.51FM**	TCMT090204-FM	.016																		●											C035 E015 E016
	TCMT**21.50.5FM**	TCMT110202-FM	.008																		●											
	TCMT**21.51FM**	TCMT110204-FM	.016																		●											
Finish Cutting	TCMT**32.51FM**	TCMT16T304-FM	.016																		●											
FV	**TCMT21.51FV**	TCMT110204-FV	.016			▲																	★●		●		★					
	TCMT**32.51FV**	TCMT16T304-FV	.016			▲																	★●		●							C035 E015 E016
Finish Cutting																																
FJ-P	**TCGT21.5V5FJ-P**	TCGT1102V5-FJ-P	.002																												●	
	TCGT**21.50.2FJ-P**	TCGT110201-FJ-P	.004																												●	
	TCGT**21.50.5FJ-P**	TCGT110202-FJ-P	.008																												●	C035 E015 E016
	TCGT**32.5V5FJ-P**	TCGT16T3V5-FJ-P	.002																												●	
Finish Cutting	TCGT**32.50.2FJ-P**	TCGT16T301-FJ-P	.004																												●	
	TCGT**32.50.5FJ-P**	TCGT16T302-FJ-P	.008																												●	
AZ	**TCGT21.50.5AZ**	TCGT110202-AZ	.008																											●		
	TCGT**21.51AZ**	TCGT110204-AZ	.016																											●		
	TCGT**21.52AZ**	TCGT110208-AZ	.031																											●		C035 E015 E016
	TCGT**32.50.5AZ**	TCGT16T302-AZ	.008																											●		
	TCGT**32.51AZ**	TCGT16T304-AZ	.016																											●		
Medium-Finish Cutting	TCGT**32.52AZ**	TCGT16T308-AZ	.031																											●		

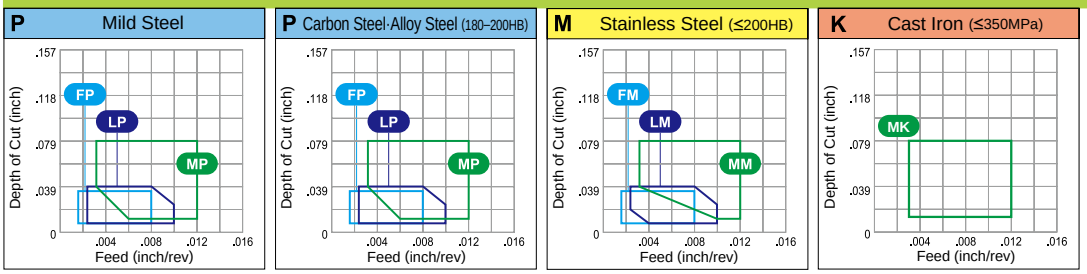
CHIP BREAKER ➤ A060
IDENTIFICATION ➤ A002

60° TC TYPE INSERTS WITH HOLE

TCGT 1.2 1 V3 LF
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
R/L F	**TCGT1.21V3LF**	TCGT0601V3L-F	.0012																				★											
	TCGT**1.210.2LF**	TCGT060101L-F	.004																		●		★											
	TCGT**1.210.5RF**	TCGT060102R-F	.008																		★		★								★			
	TCGT**1.210.5LF**	TCGT060102L-F	.008																		●		★								●			E030
	TCGT**1.211RF**	TCGT060104R-F	.016																				★								★			
Finish Cutting	TCGT**1.211LF**	TCGT060104L-F	.016																		●		★								●			
LP	**TCMT1.81.51LP**	TCMT090204-LP	.016	●			●	●															●		●									
	TCMT**1.81.52LP**	TCMT090208-LP	.031	●			●	●															●		●									
	TCMT**21.51LP**	TCMT110204-LP	.016	●			●	●															●		●									C035
	TCMT**21.52LP**	TCMT110208-LP	.031	●			●	●															●		●									E015
	TCMT**32.51LP**	TCMT16T304-LP	.016	●			●	●															●		●									E016
Light Cutting	TCMT**32.52LP**	TCMT16T308-LP	.031	●			●	●															●		●									
LM	**TCMT1.81.51LM**	TCMT090204-LM	.016							●	●										●													
	TCMT**1.81.52LM**	TCMT090208-LM	.031							●	●										●													
	TCMT**21.51LM**	TCMT110204-LM	.016							●	●										●													C035
	TCMT**21.52LM**	TCMT110208-LM	.031							●	●										●													E015
	TCMT**32.51LM**	TCMT16T304-LM	.016							●	●										●													E016
Light Cutting	TCMT**32.52LM**	TCMT16T308-LM	.031							●	●										●													
MJ	**TCGT21.51MJ**	TCGT110204-MJ	.016																	●														
	TCGT**32.51MJ**	TCGT16T304-MJ	.016																	●														C035
	TCGT**32.52MJ**	TCGT16T308-MJ	.031																	●														E015
Light Cutting																																		E016
MJ-P	**TCGT21.51MJ-P**	TCGT110204-MJ-P	.016																														●	
	TCGT**32.51MJ-P**	TCGT16T304-MJ-P	.016																														●	C035
	TCGT**32.52MJ-P**	TCGT16T308-MJ-P	.031																														●	E015
Light Cutting																																		E016

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet				Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
MP	**TCMT1.81.51MP**	TCMT090204-MP	.016	●		●	●																●		●							
	TCMT**1.81.52MP**	TCMT090208-MP	.031	●		●	●																●		●							
	TCMT**21.51MP**	TCMT110204-MP	.016	●		●	●																●		●							
	TCMT**21.52MP**	TCMT110208-MP	.031	●		●	●																●		●							C035 E015 E016
	TCMT**2.521MP**	TCMT130304-MP	.016	●		●	●																●		●							
	TCMT**32.51MP**	TCMT16T304-MP	.016	●		●	●																●		●							
Medium Cutting	TCMT**32.52MP**	TCMT16T308-MP	.031	●		●	●																●		●							
	TCMT**32.53MP**	TCMT16T312-MP	.047	●		●	●																●		●							
MM	**TCMT1.81.51MM**	TCMT090204-MM	.016							●	●										●											
	TCMT**1.81.52MM**	TCMT090208-MM	.031							●	●										●											
	TCMT**21.51MM**	TCMT110204-MM	.016							●	●										●											
	TCMT**21.52MM**	TCMT110208-MM	.031							●	●										●											C035 E015 E016
	TCMT**2.521MM**	TCMT130304-MM	.016							●	●										●											
	TCMT**32.51MM**	TCMT16T304-MM	.016							●	●										●											
Medium Cutting	TCMT**32.52MM**	TCMT16T308-MM	.031							●	●										●											
	TCMT**32.53MM**	TCMT16T312-MM	.047							●	●										●											
NEW MK	**TCMT32.51MK**	TCMT16T304-MK	.016												●	●																
	TCMT**32.52MK**	TCMT16T308-MK	.031												●	●																
	TCMT**32.53MK**	TCMT16T312-MK	.047												●	●																E015
Medium Cutting																																
Standard	**TCMT1.51.51**	TCMT080204	.016																				●	●				★				
	TCMT**1.81.51**	TCMT090204	.016		● ▲							★											★	●	●	●		★		●		
	TCMT**21.50.5**	TCMT110202	.008		● ▲							●									●		★	●	●	●		★				
	TCMT**21.51**	TCMT110204	.016	●	● ▲							●					★				●		★	●	●	●		●		●		
	TCMT**21.52**	TCMT110208	.031	●	●																●			●								C035 E015 E016
	TCMT**2.520.5**	TCMT130302	.008																					●	●							
	TCMT**2.521**	TCMT130304	.016		●							●											●	●								
	TCMT**32.51**	TCMT16T304	.016	●	● ▲							●					●				●		★	●	●	●		●		●		
Medium Cutting	TCMT**32.52**	TCMT16T308	.031	●	● ▲							●					●				●		★	●	●	●		●		●		
	TCMT**32.53**	TCMT16T312	.047		★																											
Flat Top	**TCMW21.51**	TCMW110204	.016														★	★												★		
	TCMW**2.521**	TCMW130304	.016																											★		C035 E015 E016
	TCMW**32.51**	TCMW16T304	.016												●	●	●	●												★		
	TCMW**32.52**	TCMW16T308	.031												●	●	●	●												★		

CHIP BREAKER ➤ A060
IDENTIFICATION ➤ A002

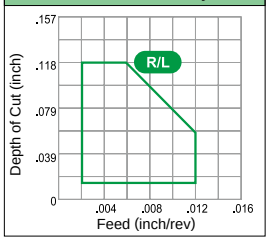
60° TE TYPE INSERTS WITH HOLE

TEGX 3 2 0.5 R
Size Thickness Corner Radius R/L
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Medium Cutting

N Aluminum Alloy



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
R/L	**TEGX320.5R**	TEGX160302R	.008																											●			
	TEGX**320.5L**	TEGX160302L	.008																											●			
	TEGX**321R**	TEGX160304R	.016																											●			C042 E028
	TEGX**321L**	TEGX160304L	.016																											●			
Medium Cutting																																	

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

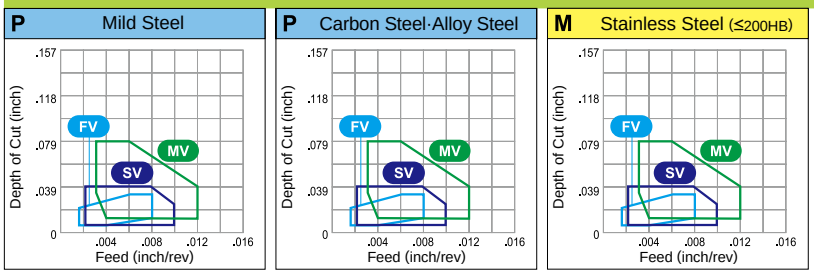
CHIP BREAKER ➤ A070

60° TP TYPE INSERTS WITH HOLE

TPMH 1.5 1.5 0.5 FV
Size · Thickness · Corner Radius · Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✲ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet			Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020 NEW	MC6015 NEW	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 NEW	MC5015 NEW	UC5105	UC5115	VP05RT	VP10RT	VP15TF	VP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
FV	TPMH1.51.50.5FV	TPMH080202-FV	.008			▲														●		●	★	●								E007
	TPMH1.51.51FV	TPMH080204-FV	.016			▲														●		●	★	●								
	TPMH1.81.50.5FV	TPMH090202-FV	.008			▲														●		●	★	●								
	TPMH1.81.51FV	TPMH090204-FV	.016			▲														●		●	★	●								
	TPMH220.5FV	TPMH110302-FV	.008			▲														●		●	★	●								
	TPMH221FV	TPMH110304-FV	.016			▲														●		●	★	●								
	TPMH222FV	TPMH110308-FV	.031			▲														●		●	★	●								
	TPMH320.5FV	TPMH160302-FV	.008			▲														●		●	★	●								
	TPMH321FV	TPMH160304-FV	.016			▲														●		●	★	●								
Finish Cutting	TPMH322FV	TPMH160308-FV	.031			▲														●		●	★	●								
R/L FS	TPGH1.51.50.5RFS	TPGH080202R-FS	.008																	●		★								●		E007
	TPGH1.51.50.5LFS	TPGH080202L-FS	.008																	●		★		●	★					●		
	TPGH1.51.51RFS	TPGH080204R-FS	.016																	●		★								●		
	TPGH1.51.51LFS	TPGH080204L-FS	.016																	●		★		●	★					●		
	TPGH1.81.50.5RFS	TPGH090202R-FS	.008																	●		★								●		
	TPGH1.81.50.5LFS	TPGH090202L-FS	.008																	●		★		●	★					●		
	TPGH1.81.51RFS	TPGH090204R-FS	.016																	●		★								●		
	TPGH1.81.51LFS	TPGH090204L-FS	.016																	●		★		●	★					●		
	TPGH220.5RFS	TPGH110302R-FS	.008																	●		★								●		
	TPGH220.5LFS	TPGH110302L-FS	.008																	●		★		●	★					●		
	TPGH221RFS	TPGH110304R-FS	.016																	●		★								●		
	TPGH221LFS	TPGH110304L-FS	.016																	●		★		●	★					●		
	TPGH321RFS	TPGH160304R-FS	.016																	●		★								●		
	TPGH321LFS	TPGH160304L-FS	.016																	●		★		●						●		
	TPGH322RFS	TPGH160308R-FS	.031																	●		★								●		
Finish Cutting	TPGH322LFS	TPGH160308L-FS	.031																	●		★		●						●		
SQ	TPMT1.81.51SQ	TPMT090204-SQ	.016										●																			–
	TPMT21.50.5SQ	TPMT110202-SQ	.008	●									●																			
	TPMT21.51SQ	TPMT110204-SQ	.016	●									●																			
	TPMT21.52SQ	TPMT110208-SQ	.031	●									●																			
	TPMT32.51SQ	TPMT16T304-SQ	.016										●																			
Finish Cutting	TPMT32.52SQ	TPMT16T308-SQ	.031										●																			

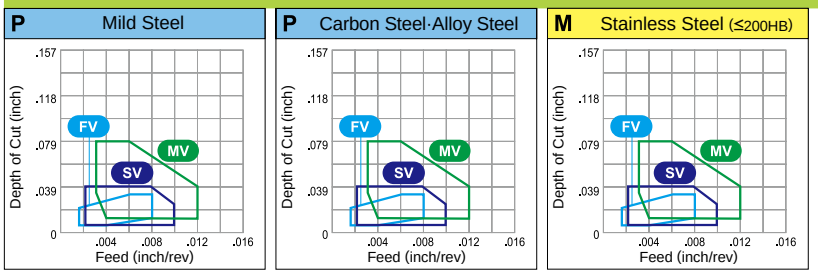
CHIP BREAKER ➤ A066
IDENTIFICATION ➤ A002

60° TP TYPE INSERTS WITH HOLE

TPGX 1.5 1.5 0.5 R
Size / Thickness / Corner Radius / R/L
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet			Carbide					Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
R/L	**TPGX1.51.50.5R**	TPGX080202R	.008																			★											
	TPGX**1.51.50.5L**	TPGX080202L	.008																			★							★	●			
	TPGX**1.51.51R**	TPGX080204R	.016																			★								★			
	TPGX**1.51.51L**	TPGX080204L	.016																		★	★							★	●			
	TPGX**1.81.50.5R**	TPGX090202R	.008																			★											
	TPGX**1.81.50.5L**	TPGX090202L	.008																			★							★	●			
	TPGX**1.81.51R**	TPGX090204R	.016																			★								●			
	TPGX**1.81.51L**	TPGX090204L	.016																		★	★							★	●			E007
	TPGX**1.81.52R**	TPGX090208R	.031																											★			
	TPGX**1.81.52L**	TPGX090208L	.031																			★								★			
	TPGX**220.5L**	TPGX110302L	.008																			★							★	★			
	TPGX**221R**	TPGX110304R	.016																		★	★								★			
	TPGX**221L**	TPGX110304L	.016																		★	★							★	★			
Finish Cutting	TPGX**222R**	TPGX110308R	.031																			★								★			
	TPGX**222L**	TPGX110308L	.031																		★	★							★	★	●		
L	**TPMX1.81.51L**	TPMX090204L	.016																			★											
	TPMX**221L**	TPMX110304L	.016																			★											
Finish Cutting																																	E007
SV	**TPMH1.51.50.5SV**	TPMH080202-SV	.008			▲	●				▲	●									★	★	●	●									
	TPMH**1.51.51SV**	TPMH080204-SV	.016			▲	●				▲	●									★	★	●	●		●							
	TPMH**1.81.50.5SV**	TPMH090202-SV	.008			▲	●				▲	●									★	★	●	●									
	TPMH**1.81.51SV**	TPMH090204-SV	.016			▲	●				▲	●									★	★	●	●		●							
	TPMH**220.5SV**	TPMH110302-SV	.008			▲	●				▲	●									★	★	●	●		●							
	TPMH**221SV**	TPMH110304-SV	.016			▲	●				▲	●									★	★	●	●		●							E007
	TPMH**222SV**	TPMH110308-SV	.031			▲	●				▲	●									★	★	●	●		●							
	TPMH**320.5SV**	TPMH160302-SV	.008			▲	●				▲	●									★	★	★	●		★							
	TPMH**321SV**	TPMH160304-SV	.016			▲	●				▲	●									★	★	★	●		★							
Light Cutting	TPMH**322SV**	TPMH160308-SV	.031			▲	●				▲	●									★	★	★	●		●							

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	● ◐ ✣ ◐ ✣ ✣
M	Stainless Steel	◐ ✣ ● ✣
K	Cast Iron	● ✣ ● ◐ ◐ ✣ ✣ ●
N	Non-Ferrous Metal	◐ ✣ ✣ ● ● ◐ ◐ ◐ ◐ ✣ ● ◐
S	Heat-resistant Alloy, Titanium Alloy	● ◐ ✣ ✣ ◐ ● ● ●

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet				Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 NEW	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 NEW	MC5015 NEW	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
Standard	**TPMX221**	TPMX110304	.016																			★	●	●								
	TPMX**222**	TPMX110308	.031																			★	●	●								
Medium Cutting																																E007
MV	**TPMH1.51.50.5MV**	TPMH080202-MV	.008			▲		●				▲	●							●		★	●	●								
	TPMH**1.51.51MV**	TPMH080204-MV	.016			▲		●				▲	●							●		★	●	●	●		●					
	TPMH**1.81.50.5MV**	TPMH090202-MV	.008			▲		●				▲	●							●		★	●	●								
	TPMH**1.81.51MV**	TPMH090204-MV	.016			▲		●				▲	●							●		★	●	●	●		●					
	TPMH**1.81.52MV**	TPMH090208-MV	.031			▲		●												●			●	●								
	TPMH**220.5MV**	TPMH110302-MV	.008			▲		●				▲	●							★		★	●	●	●		★					
	TPMH**221MV**	TPMH110304-MV	.016			▲		●				▲	●							●		★	●	●	●		●					
	TPMH**222MV**	TPMH110308-MV	.031			▲		●				▲	●							●		★	●	●	●		●					
	TPMH**321MV**	TPMH160304-MV	.016			▲		●				▲	●							●		★	★	●	●		★					
Medium Cutting	TPMH**322MV**	TPMH160308-MV	.031			▲		●				▲	●							●		★	★	●	●		●					E007
MQ	**TPMT21.51MQ**	TPMT110204-MQ	.016	●								●																				
	TPMT**21.52MQ**	TPMT110208-MQ	.031	●								●													●							
	TPMT**32.51MQ**	TPMT16T304-MQ	.016	●								●																				
Medium Cutting	TPMT**32.52MQ**	TPMT16T308-MQ	.031	●								●																				–
Flat Top	**TPGX1.51.50.5**	TPGX080202	.008																									●		●		
	TPGX**1.51.51**	TPGX080204	.016																	★	★	★						●		●		
	TPGX**1.51.52**	TPGX080208	.031																			★						●		★		
	TPGX**1.81.50.5**	TPGX090202	.008																											●		
	TPGX**1.81.51**	TPGX090204	.016																			★	★					●		●		
	TPGX**1.81.52**	TPGX090208	.031																			★	★					●		●		
	TPGX**220.5**	TPGX110302	.008																											●		
	TPGX**221**	TPGX110304	.016																	★	★	★						●	★	●		
	TPGX**222**	TPGX110308	.031																			★	★					●	★	●		
	TPGX**321**	TPGX160304	.016																			★						★		●		
	TPGX**322**	TPGX160308	.031																									★		●		

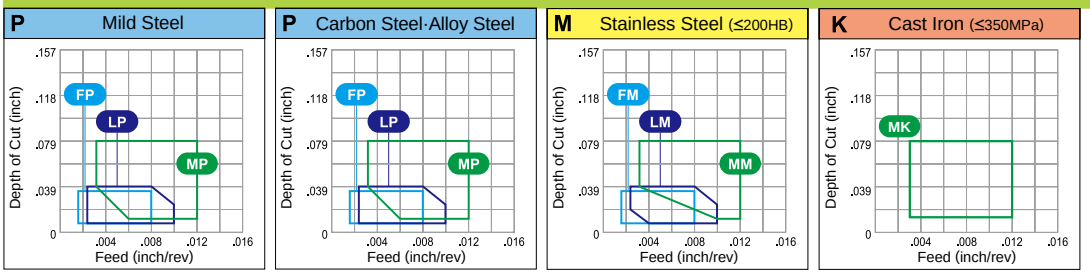
CHIP BREAKER ➤ A066
IDENTIFICATION ➤ A002

35° VB TYPE INSERTS WITH HOLE

VBMT 2 2 0.5 FP
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet		Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
FP	**VBMT220.5FP**	VBMT110302-FP	.008	●		●	●															●		●								C028 C029 D010 D011 D014 D015 E009 E010 H013
	VBMT**221FP**	VBMT110304-FP	.016	●		●	●															●		●								
	VBMT**222FP**	VBMT110308-FP	.031	●		●	●															●		●								
	VBMT**331FP**	VBMT160404-FP	.016	●		●	●															●		●								
	VBMT**332FP**	VBMT160408-FP	.031	●		●	●															●		●								
FM	**VBMT220.5FM**	VBMT110302-FM	.008																	●												C028 C029 D010 D011 D014 D015 E009 E010 H013
	VBMT**221FM**	VBMT110304-FM	.016																	●												
	VBMT**222FM**	VBMT110308-FM	.031																	●												
	VBMT**331FM**	VBMT160404-FM	.016																	●												
	VBMT**332FM**	VBMT160408-FM	.031																	●												
FV	**VBMT221FV**	VBMT110304-FV	.016			▲														●		● ★										C028 C029 D010 D011 D014 D015 E009 E010 H013
	VBMT**222FV**	VBMT110308-FV	.031			▲														●		● ★										
	VBMT**331FV**	VBMT160404-FV	.016			▲														●		● ★										
	VBMT**332FV**	VBMT160408-FV	.031			▲														●		● ★										
FJ	**VBGT33V5FJ**	VBGT1604V5-FJ	.002																	●												C028 C029 H013
	VBGT**330.2FJ**	VBGT160401-FJ	.004																	●												
	VBGT**330.5FJ**	VBGT160402-FJ	.008																	●												
FJ-P	**VBGT33V5FJ-P**	VBGT1604V5-FJ-P	.002																												●	C028 C029 H013
	VBGT**330.2FJ-P**	VBGT160401-FJ-P	.004																												●	
	VBGT**330.5FJ-P**	VBGT160402-FJ-P	.008																												●	

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet				Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
R/L F	**VBGT220.5RF**	VBGT110302R-F	.008																	●	★		●	★					●			
	VBGT**220.5LF**	VBGT110302L-F	.008																	●	★		●	★					●			C028
	VBGT**221RF**	VBGT110304R-F	.016																	●	★			★					●			C029
	VBGT**221LF**	VBGT110304L-F	.016																	●	★			★					●			D010 D011
	VBGT**330.5RF**	VBGT160402R-F	.008																	★	★			★					★			D014
	VBGT**330.5LF**	VBGT160402L-F	.008																	★	★			★					★			D015
	VBGT**331RF**	VBGT160404R-F	.016																	★	★			★					★			E009 E010
Finish Cutting	VBGT**331LF**	VBGT160404L-F	.016																	★	★			★					★			
LP	**VBMT221LP**	VBMT110304-LP	.016		●		●●																●		●								C028
	VBMT**222LP**	VBMT110308-LP	.031		●		●●																●		●								C029 D010
	VBMT**331LP**	VBMT160404-LP	.016		●		●●																●		●								D011 D014
	VBMT**332LP**	VBMT160408-LP	.031		●		●●																●		●								D015 E009
Light Cutting																																	E010 H013
LM	**VBMT221LM**	VBMT110304-LM	.016							●●											●												C028
	VBMT**222LM**	VBMT110308-LM	.031							●●											●												C029 D010
	VBMT**331LM**	VBMT160404-LM	.016							●●											●												D011 D014
	VBMT**332LM**	VBMT160408-LM	.031							●●											●												D015 E009
Light Cutting																																	E010 H013
SV	**VBMT221SV**	VBMT110304-SV	.016			▲															●			●									C028
	VBMT**222SV**	VBMT110308-SV	.031			▲															●			●									C029 D010
	VBMT**331SV**	VBMT160404-SV	.016			▲															●			●									D011 D014
	VBMT**332SV**	VBMT160408-SV	.031			▲															●			●									D015 E009
Light Cutting																																	E010 H013
MJ	**VBGT331MJ**	VBGT160404-MJ	.016																	●													C028
	VBGT**332MJ**	VBGT160408-MJ	.031																	●													C029 H013
Light Cutting																																	
MJ-P	**VBGT331MJ-P**	VBGT160404-MJ-P	.016																													●	C028
	VBGT**332MJ-P**	VBGT160408-MJ-P	.031																													●	C029 H013
Light Cutting																																	
MP	**VBMT331MP**	VBMT160404-MP	.016		●		●●																●		●								C028
	VBMT**332MP**	VBMT160408-MP	.031		●		●●																●		●								C029 H013
Medium Cutting																																	

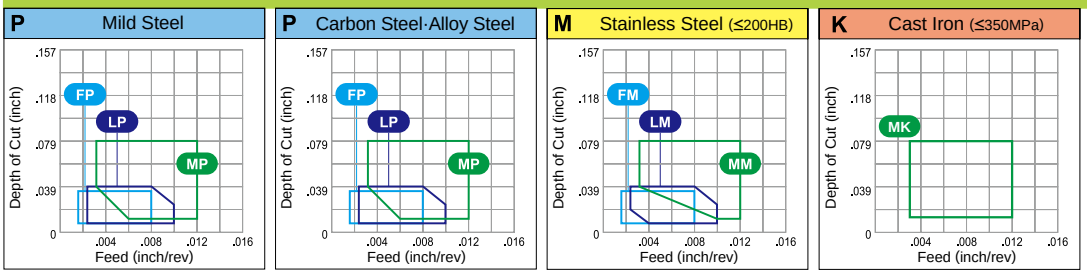
CHIP BREAKER ➤ A056
IDENTIFICATION ➤ A002

35° VB TYPE INSERTS WITH HOLE

VBMT 3 3 1 MM
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
MM	**VBMT331MM**	VBMT160404-MM	.016							●	●										●												
	VBMT**332MM**	VBMT160408-MM	.031							●	●										●													C028 C029 H013
Medium Cutting																																	
Standard	**VBMT331**	VBMT160404	.016	●																													
	VBMT**332**	VBMT160408	.031	●									●																					C028 C029 H013
Medium Cutting																																	
MV	**VBMT221MV**	VBMT110304-MV	.016			▲		●				▲	●								●		★	●	●	●		★						C028 C029 D010 D011 D014 D015 E009 E010 H013
	VBMT**222MV**	VBMT110308-MV	.031			▲		●				▲	●								●		★	●	●	●		★						
	VBMT**331MV**	VBMT160404-MV	.016			▲		●				▲	●								●		★	●	●	●		★						
	VBMT**332MV**	VBMT160408-MV	.031			▲		●				▲	●								●		★	●	●	●		★						
Medium Cutting																																	
R/L SR	**VBET22V3RSR**	VBET1103V3R-SR	.0012																		●		★								●		
	VBET**22V3LSR**	VBET1103V3L-SR	.0012																		●		★								●		C028 C029 D010 D011 D014 D015 E009 E010
	VBET**220.2RSR**	VBET110301R-SR	.004																		●		★								●		
	VBET**220.2LSR**	VBET110301L-SR	.004																		●		★								●		
	VBET**220.5RSR**	VBET110302R-SR	.008																		●		★								●		
	VBET**220.5LSR**	VBET110302L-SR	.008																		●		★								●		
	VBET**221RSR**	VBET110304R-SR	.016																		●		★								●		
Medium Cutting	VBET**221LSR**	VBET110304L-SR	.016																		●		★								●		

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✠ Unstable Cutting

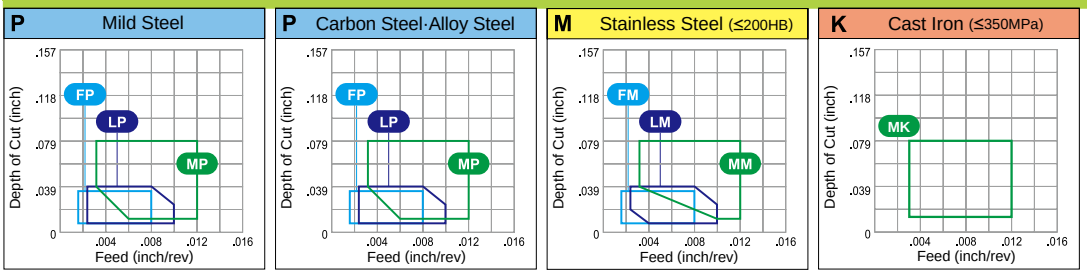
Work Material		
P	Steel	● ◕ ✠ ◕ ✠ ✠
M	Stainless Steel	◕ ✠ ○ ✠
K	Cast Iron	● ✠ ● ◕ ◕ ✠ ✠ ✠ ●
N	Non-Ferrous Metal	● ◕ ✠ ◕ ✠ ✠ ● ◕ ✠ ✠ ✠

35° VC TYPE INSERTS WITH HOLE

VCMT 2 2 0.5 FP
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
FP	**VCMT220.5FP**	VCMT110302-FP	.008	●			●	●															●		●									
	VCMT**221FP**	VCMT110304-FP	.016	●			●	●															●		●									C036 E016 E017
	VCMT**331FP**	VCMT160404-FP	.016	●			●	●															●		●									
	VCMT**332FP**	VCMT160408-FP	.031	●			●	●															●		●									
Finish Cutting																																		
FM	**VCMT220.5FM**	VCMT110302-FM	.008																		●													
	VCMT**221FM**	VCMT110304-FM	.016																		●													C036 E016 E017
	VCMT**331FM**	VCMT160404-FM	.016																		●													
	VCMT**332FM**	VCMT160408-FM	.031																		●													
Finish Cutting																																		
FV	**VCMT1.51.50.5FV**	VCMT080202-FV	.008			▲		○													●		● ★		●									
	VCMT**1.51.51FV**	VCMT080204-FV	.016			▲		○													●		● ★		●									C036 E009 E010 E016 E017
	VCMT**331FV**	VCMT160404-FV	.016	★	▲																		★ ●			●								
	VCMT**332FV**	VCMT160408-FV	.031	★	▲																		★ ●			●								
Finish Cutting																																		
AZ	**VCGT331AZ**	VCGT160404-AZ	.016																												●			
	VCGT**332AZ**	VCGT160408-AZ	.031																												●			C036 E016 E017
	VCGT**333AZ**	VCGT160412-AZ	.047																												●			
Finish Cutting																																		
R/L F	**VCGT1.51.50.5RF**	VCGT080202R-F	.008																		●		★			●					●			
	VCGT**1.51.50.5LF**	VCGT080202L-F	.008																		●		★			●					●			E009 E010
	VCGT**1.51.51RF**	VCGT080204R-F	.016																		●		★			●					●			
	VCGT**1.51.51LF**	VCGT080204L-F	.016																		●		★			●					●			
Finish Cutting																																		
LP	**VCMT221LP**	VCMT110304-LP	.016	●			●	●															●		●									
	VCMT**222LP**	VCMT110308-LP	.031	●			●	●															●		●									C036 E016 E017
	VCMT**331LP**	VCMT160404-LP	.016	●			●	●															●		●									
	VCMT**332LP**	VCMT160408-LP	.031	●			●	●															●		●									
Light Cutting																																		

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet				Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
LM	**VCMT221LM**	VCMT110304-LM	.016							●	●									●												
	VCMT**222LM**	VCMT110308-LM	.031							●	●									●												C036 E016 E017
	VCMT**331LM**	VCMT160404-LM	.016							●	●									●												
Light Cutting	VCMT**332LM**	VCMT160408-LM	.031							●	●									●												
SV	**VCMT1.51.50.5SV**	VCMT080202-SV	.008			▲		○												●		●		●								
	VCMT**1.51.51SV**	VCMT080204-SV	.016			▲		○												●		●		●								E009 E010
Light Cutting																																
MP	**VCMT331MP**	VCMT160404-MP	.016		●		●	●														●		●								
	VCMT**332MP**	VCMT160408-MP	.031		●		●	●														●		●								C036 E016 E017
	VCMT**333MP**	VCMT160412-MP	.047		●		●	●														●		●								
Medium Cutting																																
MM	**VCMT331MM**	VCMT160404-MM	.016							●	●									●												
	VCMT**332MM**	VCMT160408-MM	.031							●	●									●												C036 E016 E017
	VCMT**333MM**	VCMT160412-MM	.047							●	●									●												
Medium Cutting																																
NEW **MK**	**VCMT331MK**	VCMT160404-MK	.016												●	●																
	VCMT**332MK**	VCMT160408-MK	.031												●	●																C036 E016 E017
Medium Cutting																																
Standard	**VCMT221**	VCMT110304	.016		●	▲						●								●		★	●	●				★		★		
	VCMT**331**	VCMT160404	.016	●	●	▲						●					★			●		★	●	●				●		●		
	VCMT**332**	VCMT160408	.031	●	●	▲						●					●			●		★	●	●				●				C036 E016 E017
Medium Cutting	VCMT**333**	VCMT160412	.047		●	▲						●										★	●									
MV	**VCMT1.51.50.5MV**	VCMT080202-MV	.008			▲		●			▲	●								●		★	●	●		★						
	VCMT**1.51.51MV**	VCMT080204-MV	.016			▲		●			▲	●								●		★	●	●		★						E009 E010
Medium Cutting																																
Flat Top	**VCMW221**	VCMW110304	.016																											★		
	VCMW**331**	VCMW160404	.016														★	★												★		C036 E016 E017
	VCMW**332**	VCMW160408	.031														★	★												★		

CHIP BREAKER ➤ A060
IDENTIFICATION ➤ A002

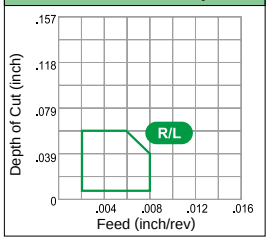
35° VD TYPE INSERTS WITH HOLE

VDGX 3 2 0.5 R
Size Thickness Corner Radius R/L
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Medium Cutting

N Aluminum Alloy



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
R/L	**VDGX320.5R**	VDGX160302R	.008																											●			
	VDGX**320.5L**	VDGX160302L	.008																											●			
	VDGX**321R**	VDGX160304R	.016																											●			C043
	VDGX**321L**	VDGX160304L	.016																											●			
Medium Cutting																																	

● : Inventory maintained.
<10 inserts in one case>

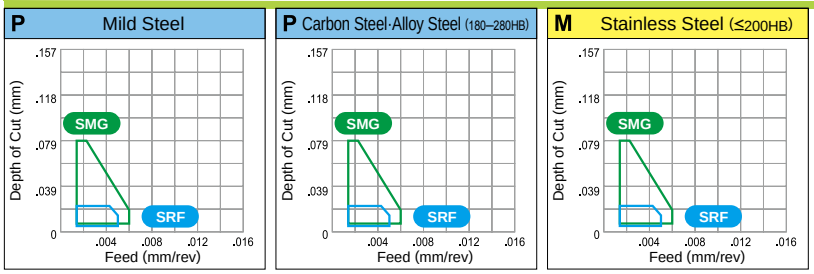
CHIP BREAKER ➤ A070

35° VP TYPE INSERTS WITH HOLE

VPET 1.5 1.5 0.2 RSRF
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Medium Cutting ···



Cutting Conditions : ● Stable Cutting ◕ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet			Carbide					Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
L/R SRF	**VPET1.51.50.2RSRF**	VPET080201R-SRF	.004																	●												D010 D014 D015
	VPET**1.51.50.2LSRF**	VPET080201L-SRF	.004																	●												
	VPET**1.51.50.5RSRF**	VPET080202R-SRF	.008																	●												
	VPET**1.51.50.5LSRF**	VPET080202L-SRF	.008																	●												
	VPET**22V3RSRF**	VPET1103V3R-SRF	.0012																	●												
	VPET**22V3LSRF**	VPET1103V3L-SRF	.0012																	●												
	VPET**220.2RSRF**	VPET110301R-SRF	.004																	●												
	VPET**220.2LSRF**	VPET110301L-SRF	.004																	●												
	VPET**220.5RSRF**	VPET110302R-SRF	.008																	●												
Finish Cutting	VPET**220.5LSRF**	VPET110302L-SRF	.008																	●												
SMG	**VPGT1.51.50.2MSMG**	VPGT080201M-SMG	.004																	●												D010 D014 D015
	VPGT**1.51.50.5MSMG**	VPGT080202M-SMG	.008																	●												
	VPGT**220.2MSMG**	VPGT110301M-SMG	.004																	●												
	VPGT**220.5MSMG**	VPGT110302M-SMG	.008																	●												
Medium Cutting																																

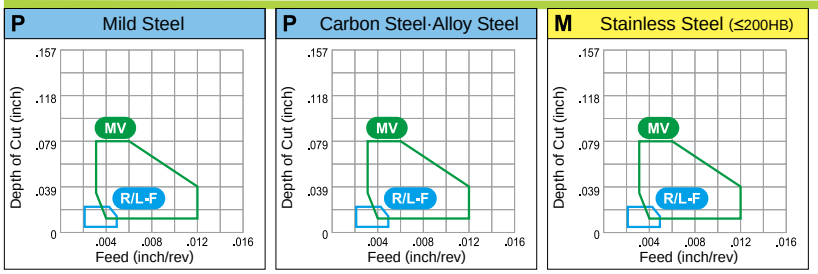
CHIP BREAKER ➤ A066
IDENTIFICATION ➤ A002

80° WB TYPE INSERTS WITH HOLE

WBGT 1.2 1 V3 L F
Size Thickness Corner Radius R/L Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Medium Cutting



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet			Carbide					Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	VP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
R/L F	**WBGT1.21V3LF**	WBGT0201V3L-F	.0012																	●	★											
	WBGT**1.210.2LF**	WBGT020101L-F	.004																	●	★											
	WBGT**1.210.5LF**	WBGT020102L-F	.008																	●	★	●										
	WBGT**1.211LF**	WBGT020104L-F	.016																	●	★	●										
	WBGT**1.51.5V3LF**	WBGTL302V3L-F	.0012																	●	★											E009 E029
	WBGT**1.51.50.2LF**	WBGTL30201L-F	.004																	●	★											
	WBGT**1.51.50.5RF**	WBGTL30202R-F	.008																	●	★											
	WBGT**1.51.50.5LF**	WBGTL30202L-F	.008																	●	★	●										
Finish Cutting	WBGT**1.51.51RF**	WBGTL30204R-F	.016																	●	★											
	WBGT**1.51.51LF**	WBGTL30204L-F	.016																	●	★	●										
R/L MV	**WBMT1.51.50.5RMV**	WBMTL30202R-MV	.008			▲	●			▲										★	★●	●				★						E009 E029
	WBMT**1.51.50.5LMV**	WBMTL30202L-MV	.008			▲	●			▲										★	★●	●				★						
	WBMT**1.51.51RMV**	WBMTL30204R-MV	.016			▲	●			▲										★	★●	●				★						
Medium Cutting	WBMT**1.51.51LMV**	WBMTL30204L-MV	.016			▲	●			▲										★	★●	●				★						

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

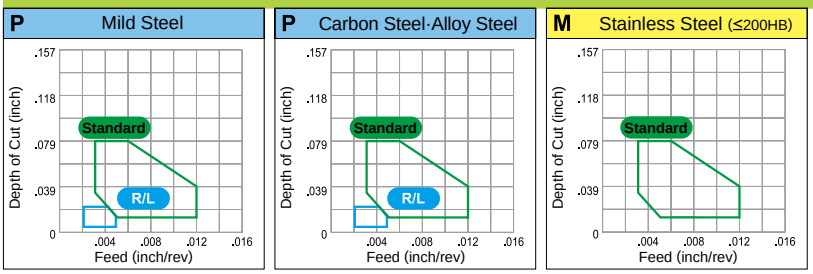
CHIP BREAKER ➤ A056

80° WC TYPE INSERTS WITH HOLE

WCGT 2 1.5 V5 FJ-P
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Medium Cutting



Cutting Conditions : ● Stable Cutting ◔ General Cutting ✲ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet				Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	VP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
FJ-P	**WCGT21.5V5FJ-P**	WCGT0402V5-FJ-P	.002																											◔		
	WCGT**21.50.2FJ-P**	WCGT040201-FJ-P	.004																											◔		
	WCGT**21.50.5FJ-P**	WCGT040202-FJ-P	.008																											◔		C037 E017 −020
	WCGT**32.5V5FJ-P**	WCGT06T3V5-FJ-P	.002																											◔		
	WCGT**32.50.2FJ-P**	WCGT06T301-FJ-P	.004																											◔		
Finish Cutting	WCGT**32.50.5FJ-P**	WCGT06T302-FJ-P	.008																											◔		
R/L	**WCGT1.210.5R**	WCGT020102R	.008																			★										
	WCGT**1.210.5L**	WCGT020102L	.008																			★								◔		
	WCGT**1.211R**	WCGT020104R	.016																			★										E017 −020
	WCGT**1.211L**	WCGT020104L	.016																			★								◔		
	WCGT**1.51.50.5L**	WCGT L30202L	.008																			★										
Finish Cutting	WCGT**1.51.51L**	WCGT L30204L	.016																			★										
MJ	**WCGT21.51MJ**	WCGT040204-MJ	.016																	●												
	WCGT**32.51MJ**	WCGT06T304-MJ	.016																	●												
	WCGT**32.52MJ**	WCGT06T308-MJ	.031																	●												C037 E017 −020
Light Cutting																																
MJ-P	**WCGT21.51MJ-P**	WCGT040204-MJ-P	.016																											◔		
	WCGT**32.51MJ-P**	WCGT06T304-MJ-P	.016																											◔		
	WCGT**32.52MJ-P**	WCGT06T308-MJ-P	.031																											◔		C037 E017 −020
Light Cutting																																
Standard	**WCMT1.210.5**	WCMT020102	.008	●	▲							●										★	●	●	●			●			●	
	WCMT**1.211**	WCMT020104	.016	●	▲							●										★	●	●	●			●			●	
	WCMT**1.51.50.5**	WCMT L30202	.008	●								●										★	●	●	●			●			●	
	WCMT**1.51.51**	WCMT L30204	.016	●								●										★	●	●	●			●			●	C037 E017 −020
	WCMT**21.50.5**	WCMT040202	.008	●	▲							●										★	●	●	●			●				
	WCMT**21.51**	WCMT040204	.016	●	▲							●										★	●	●	●			●			●	
	WCMT**21.52**	WCMT040208	.031		▲																											
	WCMT**32.51**	WCMT06T304	.016	●	▲							●										★	●	●	●			●				
Medium Cutting	WCMT**32.52**	WCMT06T308	.031	●	▲							●										★	●	●	●			●				

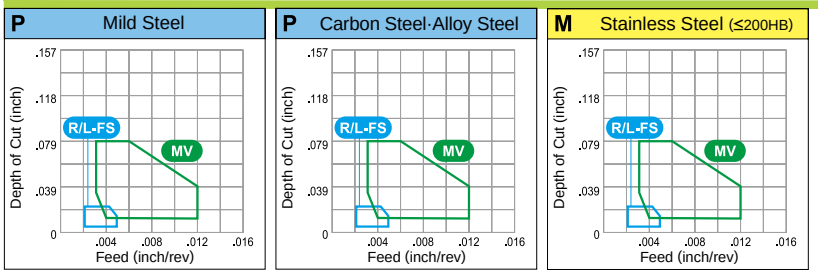
CHIP BREAKER ➤ A060
IDENTIFICATION ➤ A002

80° WP TYPE INSERTS WITH HOLE

WPGT 2 1.5 1 RFS
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Medium Cutting ···



Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
R/L FS	**WPGT21.51RFS**	WPGT040204R-FS	.016																		★		★											–
	**WPGT21.51LFS**	WPGT040204L-FS	.016																		★		★											
	WPGT321RFS	WPGT060304R-FS	.016																		★		★											
Finish Cutting	**WPGT321LFS**	WPGT060304L-FS	.016																		★		★											
MV	**WPMT21.50.5MV**	WPMT040202-MV	.008			▲		●				▲●									★		★●		●									E009
	**WPMT21.51MV**	WPMT040204-MV	.016			▲		●				▲●									★		★●		●			★						
	WPMT321MV	WPMT060304-MV	.016			▲		●				▲●									●		★●		●									
Medium Cutting	**WPMT322MV**	WPMT060308-MV	.031			▲		●				▲●									●		★●		●			★						

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

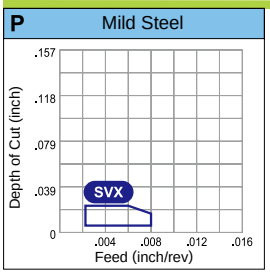
CHIP BREAKER ➤ A066

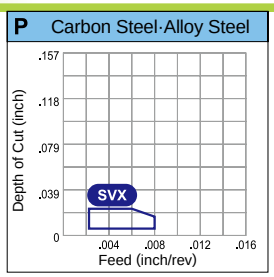
25° XC TYPE INSERTS WITH HOLE

XCMT 2 2 0.5 SVX
Size Thickness Corner Radius Chip Breaker
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Light Cutting





Cutting Conditions : ● Stable Cutting ◔ General Cutting ✲ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet			Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
SVX	XCMT220.5SVX	XCMT150302-SVX	.008																	●													
	XCMT221SVX	XCMT150304-SVX	.016			▲														●													
	XCMT222SVX	XCMT150308-SVX	.031			▲														●													C038
Light Cutting																																	

CHIP BREAKER ➤ A060
IDENTIFICATION ➤ A002

RTG TYPE INSERTS WITHOUT HOLE

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✣ Unstable Cutting

Work Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																		Cermet		Coated Cermet			Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020 NEW	MC6015 NEW	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 NEW	MC5015 NEW	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
	**RTG05A**	RTG05A	–																								●		●			–
	RTG**06A**	RTG06A	–																								●		●			
	RTG**07A**	RTG07A	–																								●					
	RTG**08A**	RTG08A	–																								●		●			
	RTG**10A**	RTG10A	–																								●		●			

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

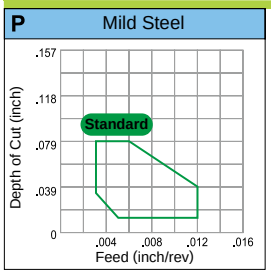
CHIP BREAKER ➤ A073

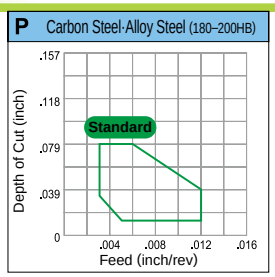
90° SP TYPE INSERTS WITHOUT HOLE

SPGR 3 2 1 R
Size Thickness Corner Radius R/L
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Medium Cutting





Cutting Conditions : ● Stable Cutting ◔ General Cutting ✲ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	MC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
R	**SPGR321R**	SPGR090304R	.016																										★					–
Finish Cutting																																		
Standard	**SPMR321**	SPMR090304	.016		● ▲																		★ ●	●										–
	SPMR322	SPMR090308	.031		● ▲																		★ ●	●										
	SPMR421	SPMR120304	.016		● ▲																		★ ★	●										
	SPMR422	SPMR120308	.031		● ▲																		● ★	●										
Light to Medium Cutting																																		
Flat Top	**SPMN321**	SPMN090304	.016																				★						★		★			–
	SPMN322	SPMN090308	.031		●																		★						★		●			
	SPMN421	SPMN120304	.016		★																★								★		★			
	SPMN422	SPMN120308	.031		●																● ★								●		●			
	SPMN423	SPMN120312	.047		★ ▲																★								★		★			
	SPMN432	SPMN120408	.031																										★		★			
	SPMN433	SPMN120412	.047																										●					
	SPMN532	SPMN150408	.031																										★					
	SPMN533	SPMN150412	.047																										●					
	SPMN631	SPMN190404	.016																										●					
	SPMN632	SPMN190408	.031																										★					
	SPMN633	SPMN190412	.047																										●					
Flat Top	**SPG321**	SPGN090304	.016																				★						●		★			–
	SPG322	SPGN090308	.031																												★			
	SPG421	SPGN120304	.016																				●						●		●			
	SPG422	SPGN120308	.031																			●	●						●		●			
	SPG423	SPGN120312	.047																												★			
	SPG431	SPGN120404	.016																												●			
	SPG432	SPGN120408	.031																										●		★			
	SPG531	SPGN150404	.016																										★					
	SPG532	SPGN150408	.031																												★			

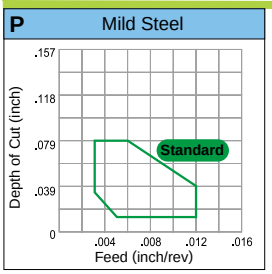
CHIP BREAKER ➤ A072
IDENTIFICATION ➤ A002

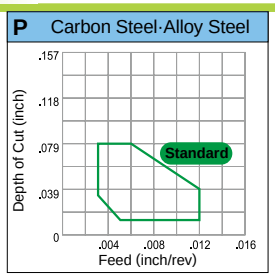
60° TC TYPE INSERTS WITHOUT HOLE

TCG 1.2 1 1
Size Thickness Corner Radius
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Medium Cutting





Cutting Conditions : ● Stable Cutting ◕ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet			Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	VP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
Flat Top	**TCG1.211**	TCGN060104	.016																										★			
	TCG**1.81.51**	TCGN090204	.016																										★			
																																–

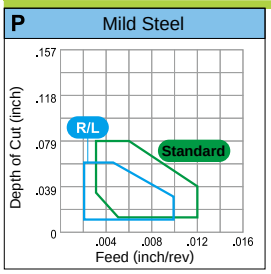
● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

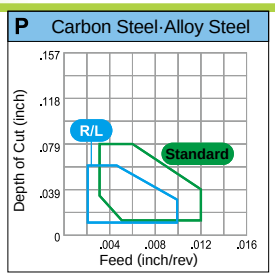
60° TP TYPE INSERTS WITHOUT HOLE

TPGR 2 2 1 R
Size Thickness Corner Radius R/L
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Medium Cutting





Cutting Conditions : ● Stable Cutting ◔ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	● ◔ ✠ ● ✠ ✠
M	Stainless Steel	◔ ✠ ○ ✠
K	Cast Iron	● ✠ ● ● ◔ ✠ ✠
N	Non-Ferrous Metal	● ✠ ✠ ○ ○ ✠ ● ● ◔
S	Heat-resistant Alloy, Titanium Alloy	● ◔ ✠ ● ◔ ◔

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated																Cermet		Coated Cermet				Carbide				Applicable Holder Page
				UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	VP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
R/L	**TPGR221R**	TPGR110304R	.016																			★							★			
	TPGR**221L**	TPGR110304L	.016																			★						★	★			
	TPGR**321R**	TPGR160304R	.016																			★						★	★			–
	TPGR**321L**	TPGR160304L	.016																			★						★	★			
	TPGR**322R**	TPGR160308R	.031																			★										
Finish Cutting	TPGR**322L**	TPGR160308L	.031																			★						★	★			
Standard	**TPMR1.81.50.5**	TPMR090202	.008																				●	●								
	TPMR**1.81.51**	TPMR090204	.016																			★	●	●								
	TPMR**1.81.52**	TPMR090208	.031																					●								
	TPMR**220.5**	TPMR110302	.008																			★	●	●								
	TPMR**221**	TPMR110304	.016		●	▲																★	●	●								–
	TPMR**222**	TPMR110308	.031		●	▲																★	●	●								
	TPMR**321**	TPMR160304	.016		●	▲																★	●	●								
	TPMR**322**	TPMR160308	.031		●	▲																★	●	●								
Light to Medium Cutting	TPMR**323**	TPMR160312	.047		●																		●	●								
Flat Top	**TPMN221**	TPMN110304	.016		●												★	★				★	★						●		★		
	TPMN**222**	TPMN110308	.031		●												★	★				★							●		★		
	TPMN**321**	TPMN160304	.016		●												★	★			●	★	★						●		●		
	TPMN**322**	TPMN160308	.031		●												★	★			●	★	★						●	★	●		
	TPMN**323**	TPMN160312	.047		★												★	★				★									●		–
	TPMN**325**	TPMN160320	.079																										★				
	TPMN**431**	TPMN220404	.016		●																								●				
	TPMN**432**	TPMN220408	.031		●	▲															●	★							●		★		
	TPMN**433**	TPMN220412	.047		●																★								●		●		

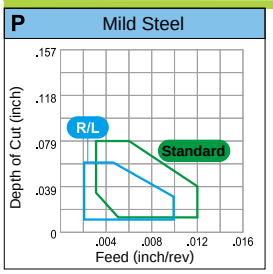
CHIP BREAKER ➤ A072
IDENTIFICATION ➤ A002

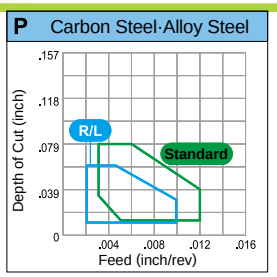
60° TP TYPE INSERTS WITHOUT HOLE

TPG 2 2 0.5
Size Thickness Corner Radius
★Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting··· Medium Cutting···





Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated: UE6105	UE6110	UE6020	MC6015 (NEW)	MC6025	UH6400	MC7025	MP7035	US7020	US735	US905	MC5005 (NEW)	MC5015 (NEW)	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
Flat Top	**TPG220.5**	TPGN110302	.008																			●								●			
	TPG**221**	TPGN110304	.016																			★							★	★	●			
	TPG**222**	TPGN110308	.031																			●									●			
	TPG**320.5**	TPGN160302	.008																												★			
	TPG**321**	TPGN160304	.016																			●	★							★	★	●			
	TPG**322**	TPGN160308	.031																			●	★							●	★	●			–
	TPG**323**	TPGN160312	.047																												●			
	TPG**324**	TPGN160316	.063																												●			
	TPG**332**	TPGN160408	.031																											★				
	TPG**431**	TPGN220404	.016																			●									●			
	TPG**432**	TPGN220408	.031																			●									●			

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

CHIP BREAKER ➤ A072
IDENTIFICATION ➤ A002

Memo

GUIDE TO CBN & PCD TURNING INSERTS

●Section organization

①Organized according to turning insert shape.
(Refer to the index on the next page.)
②Inserts are arranged in order of :
・Negative inserts (with hole→without hole)
・Positive inserts (with hole→without hole)

GRADE APPLICATION RECOMMENDED FOR EACH WORK MATERIAL
cutting conditions suitable for each work materials are shown as a general guide to select grade.
● Stable Cutting ◔ General Cutting ✠ Unstable Cutting

SHAPE & ANGLE MARK

PRODUCT SECTION

INDICATION OF NEGATIVE/POSITIVE TYPE

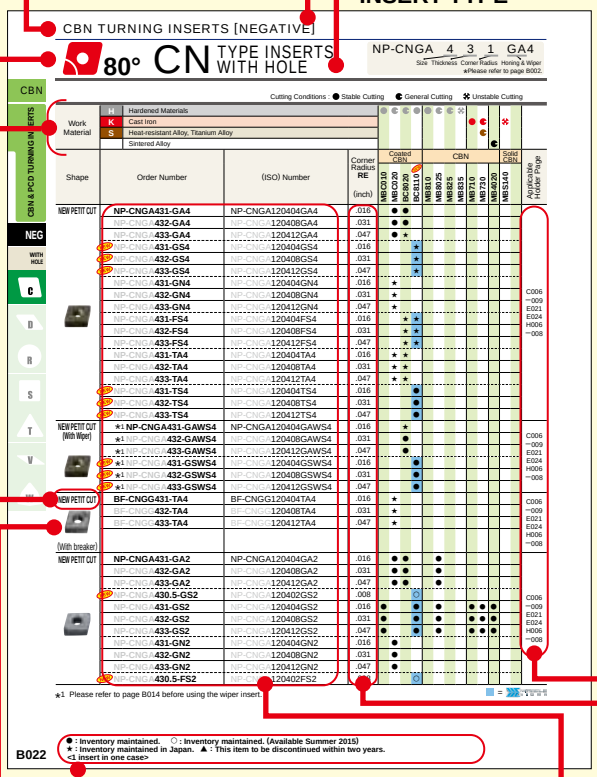
TITLE OF PRODUCT ACCORDING TO THE INSERT TYPE

FIGURE SHOWING INSERT GEOMETRY
Dimensions are detailed in the "Dimensions" column.

INSERT DIMENSIONS

INSERT GRADES

STOCK STATUS


CBN TURNING INSERTS [NEGATIVE]

80° CN TYPE INSERTS WITH HOLE

NP-CNGA 4 3 1 GA4
Size Thickness Corner Radius Honing & Wiper
※Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◔ General Cutting ✠ Unstable Cutting

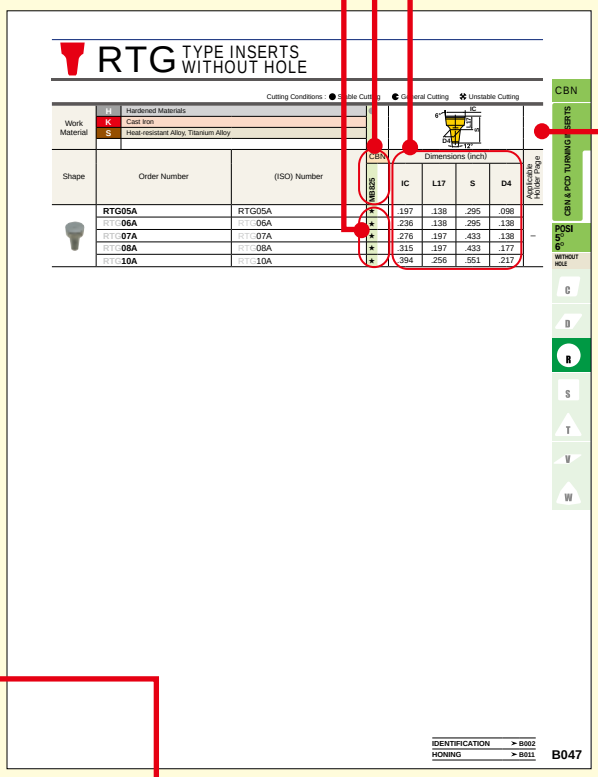
Work Material: H Hardened Materials; K Cast Iron; S Heat-resistant Alloy, Titanium Alloy; Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	MBC020	BC-S6020	BC-S7020	CBN MBB10	MBB30	MBB25	MBS25	MBS10	MBS15	MB730	MBD420	Solid CBN MBS140	Applicable Holder Page
NEW PETIT CUT	NP-CNGA431-GA4	NP-CNGA120404GA4	.016	●	●												C006 ~009 E021 E024 H006 ~008
	NP-CNGA432-GA4	NP-CNGA120408GA4	.031	●	●												
	NP-CNGA433-GA4	NP-CNGA120412GA4	.047	●	★												
	NP-CNGA431-GS4	NP-CNGA120404GS4	.016				★										
	NP-CNGA432-GS4	NP-CNGA120408GS4	.031				★										
	NP-CNGA433-GS4	NP-CNGA120412GS4	.047				★										
	NP-CNGA431-GN4	NP-CNGA120404GN4	.016	★													
	NP-CNGA432-GN4	NP-CNGA120408GN4	.031	★													
	NP-CNGA433-GN4	NP-CNGA120412GN4	.047	★													
	NP-CNGA431-FS4	NP-CNGA120404FS4	.016	★	★												
	NP-CNGA432-FS4	NP-CNGA120408FS4	.031	★	★												
	NP-CNGA433-FS4	NP-CNGA120412FS4	.047	★	★												
	NP-CNGA431-TA4	NP-CNGA120404TA4	.016	★	★												
	NP-CNGA432-TA4	NP-CNGA120408TA4	.031	★	★												
	NP-CNGA433-TA4	NP-CNGA120412TA4	.047	★	★												
	NP-CNGA431-TS4	NP-CNGA120404TS4	.016					●									
	NP-CNGA432-TS4	NP-CNGA120408TS4	.031					●									
	NP-CNGA433-TS4	NP-CNGA120412TS4	.047					●									
NEW PETIT CUT (With Wiper)	★1 NP-CNGA431-GAWS4	NP-CNGA120404GAWS4	.016		★												C006 ~009 E021 E024 H006 ~008
	★1 NP-CNGA432-GAWS4	NP-CNGA120408GAWS4	.031		●												
	★1 NP-CNGA433-GAWS4	NP-CNGA120412GAWS4	.047		●												
	★1 NP-CNGA431-GSWS4	NP-CNGA120404GSWS4	.016					●									
	★1 NP-CNGA432-GSWS4	NP-CNGA120408GSWS4	.031					●									
	★1 NP-CNGA433-GSWS4	NP-CNGA120412GSWS4	.047					●									
NEW PETIT CUT (With breaker)	BF-CNGG431-TA4	BF-CNGG120404TA4	.016	★													C006 ~009 E021 E024 H006 ~008
	BF-CNGG432-TA4	BF-CNGG120408TA4	.031	★													
	BF-CNGG433-TA4	BF-CNGG120412TA4	.047	★													
NEW PETIT CUT	NP-CNGA431-GA2	NP-CNGA120404GA2	.016	●	●				●								C006 ~009 E021 E024 H006 ~008
	NP-CNGA432-GA2	NP-CNGA120408GA2	.031	●	●				●								
	NP-CNGA433-GA2	NP-CNGA120412GA2	.047	●	●				●								
	NP-CNGA430.5-GS2	NP-CNGA120402GS2	.008				○										
	NP-CNGA431-GS2	NP-CNGA120404GS2	.016	●			●		●		●		●	●	●		
	NP-CNGA432-GS2	NP-CNGA120408GS2	.031	●			●		●		●		●	●	●		
	NP-CNGA433-GS2	NP-CNGA120412GS2	.047	●			●		●		●		●	●	●		
	NP-CNGA431-GN2	NP-CNGA120404GN2	.016	●													
	NP-CNGA432-GN2	NP-CNGA120408GN2	.031	●													
	NP-CNGA433-GN2	NP-CNGA120412GN2	.047	●													
	NP-CNGA430.5-FS2	NP-CNGA120402FS2	.008				○										

★1 Please refer to page B014 before using the wiper insert.

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<1 insert in one case>

B022


RTG TYPE INSERTS WITHOUT HOLE

Cutting Conditions: ● Stable Cutting ◔ General Cutting ✠ Unstable Cutting

Work Material: H Hardened Materials; K Cast Iron; S Heat-resistant Alloy, Titanium Alloy

Shape	Order Number	(ISO) Number	CBN MBB25	Dimensions (inch) IC	L17	S	D4	Applicable Holder Page
	RTG05A	RTG05A	★	.197	.138	.295	.098	–
	RTG06A	RTG06A	★	.236	.138	.295	.138	
	RTG07A	RTG07A	★	.276	.197	.433	.138	
	RTG08A	RTG08A	★	.315	.197	.433	.177	
	RTG10A	RTG10A	★	.394	.256	.551	.217	

IDENTIFICATION ➤B002
HONING ➤B011

B047

LEGEND FOR STOCK STATUS MARK is shown on the left hand page of each double-page spread.

APPLICABLE HOLDER PAGE indicates reference pages for details of applicable holders.

PHOTO OF INSERT

PRODUCT NAME

INSERT CORNER RADIUS

INSERT NUMBER

●To Order: Please specify insert number and grade.

TURNING

INSERT STANDARDS
INSERT GRADES

INDENTIFICATION ····· B002
CBN (CUBIC BORON NITRIDE) ····· B004
PCD GRADE MD220 (SINTERED DIAMOND) ····· B015
CLASSIFICATION OF CBN & PCD INSERTS ····· B016

STANDARD OF CBN TURNING INSERTS

● NEGATIVE INSERTS WITH HOLE
CN○○TYPE ··· RHOMBIC 80° ····· B022
DN○○TYPE ··· RHOMBIC 55° ····· B024
SN○○TYPE ··· SQUARE 90° ····· B027
TN○○TYPE ··· TRIANGULAR 60° ····· B028
VN○○TYPE ··· RHOMBIC 35° ····· B030
WN○○TYPE ··· TRIGON 80° ····· B032

● NEGATIVE INSERTS WITHOUT HOLE
CN○○TYPE ··· RHOMBIC 80° ····· B033
DN○○TYPE ··· RHOMBIC 55° ····· B033
RN○○TYPE ··· ROUND ····· B034
SN○○TYPE ··· SQUARE 90° ····· B034
TN○○TYPE ··· TRIANGULAR 60° ····· B035

● POSITIVE INSERTS WITH HOLE
CC○○TYPE ··· RHOMBIC 80° ····· B036
CP○○TYPE ··· RHOMBIC 80° ····· B038
DC○○TYPE ··· RHOMBIC 55° ····· B039
TC○○TYPE ··· TRIANGULAR 60° ····· B041
TP○○TYPE ··· TRIANGULAR 60° ····· B042
VB○○TYPE ··· RHOMBIC 35° ····· B044
VC○○TYPE ··· RHOMBIC 35° ····· B045
WC○○TYPE ··· TRIGON 80° ····· B046

● POSITIVE INSERTS WITHOUT HOLE
RTG○○TYPE ····· B047
SP○○TYPE ··· SQUARE 90° ····· B048
TB○○TYPE ··· TRIANGULAR 60° ····· B049
TP○○TYPE ··· TRIANGULAR 60° ····· B050

STANDARD OF PCD TURNING INSERTS

● NEGATIVE INSERTS WITH HOLE
CN○○TYPE ··· RHOMBIC 80° ····· B051
DN○○TYPE ··· RHOMBIC 55° ····· B051
SN○○TYPE ··· SQUARE 90° ····· B052
TN○○TYPE ··· TRIANGULAR 60° ····· B052
VN○○TYPE ··· RHOMBIC 35° ····· B053

● NEGATIVE INSERTS WITHOUT HOLE
SN○○TYPE ··· SQUARE 90° ····· B054

● POSITIVE INSERTS WITH HOLE
CC○○TYPE ··· RHOMBIC 80° ····· B055
CP○○TYPE ··· RHOMBIC 80° ····· B055
DC○○TYPE ··· RHOMBIC 55° ····· B056
SP○○TYPE ··· SQUARE 90° ····· B056
TC○○TYPE ··· TRIANGULAR 60° ····· B057
TP○○TYPE ··· TRIANGULAR 60° ····· B058
VB○○TYPE ··· RHOMBIC 35° ····· B060
VC○○TYPE ··· RHOMBIC 35° ····· B060
WC○○TYPE ··· TRIGON 80° ····· B061
WP○○TYPE ··· TRIGON 80° ····· B061
DE○○TYPE ··· RHOMBIC 55° ····· B062
TE○○TYPE ··· TRIANGULAR 60° ····· B062
VD○○TYPE ··· RHOMBIC 35° ····· B063

● POSITIVE INSERTS WITHOUT HOLE
SP○○TYPE ··· SQUARE 90° ····· B064
TP○○TYPE ··· TRIANGULAR 60° ····· B064

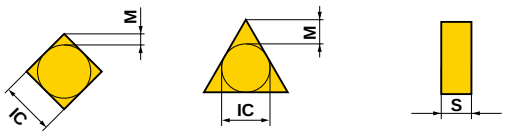
IDENTIFICATION

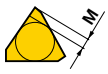
Symbol	Insert Shape
S	Square
T	Triangular
C	Rhombic 80°
D	Rhombic 55°
V	Rhombic 35°
W	Trigon
R	Round

② Symbol for Insert Shape

BM	With Breaker
BF	With Breaker
NP	Petit Tip
No mark	Standard Type

① Insert Geometry





Triangular insert with a facet (Secondary Cutting Edge)

④ Symbol for Tolerance Class

Symbol	Tolerance of Nose Height **M** (inch)	Tolerance of Inscribed Circle **IC** (inch)	Tolerance of Thickness **S** (inch)
G	±.001	±.001	±.005
M*	±.003 – ±.0063	±.002 – ±.003	±.005

*As a rule, the sides of these inserts are as sintered. Tolerance differs with insert size. For the accuracy of class M, refer to the table on the right.

Detail of M Class Insert Tolerance

●Tolerance of Nose Height **M** (inch)

I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
.250	±.003	±.003	±.003	±.004	±.0063	–
.375	±.003	±.003	±.003	±.004	±.0063	–
.500	±.005	±.005	±.005	±.006	–	–

●Tolerance of Inscribed Circle **IC** (inch)

I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
.250	±.002	±.002	±.002	±.002	±.002	–
.375	±.002	±.002	±.002	±.002	±.002	±.002
.500	±.003	±.003	±.003	±.003	–	±.003

④ Symbol for Tolerance Class

	①	②		④	
INCH	NP	- C	N	G	A
METRIC	NP	- C	N	G	A
			③		⑤

③ Symbol for Relief Angle

Symbol	Relief Angle
B	5°
C	7°
D	15°
E	20°
N	0°
P	11°

⑤ Symbol for Chipbreaker and Clamping System

Inch			Metric									
Figure	I.C. .250" and over	I.C. under .250"	Symbol	Hole	Hole Configuration	Chip Breaker	Figure	Symbol	Hole	Hole Configuration	Chip Breaker	Figure
	A	D	W	With Hole	Cylindrical Hole + One Countersink (40—60°)	No		A	With Hole	Cylindrical Hole	No	
	M	P	T	With Hole		One Sided		M	With Hole	Cylindrical Hole	One Sided	
	N	E	B	With Hole	Cylindrical Hole + One Countersink (70—90°)	No		N	Without Hole	–	No	
Special Design	X	X	H	With Hole		One Sided		X	–	–	–	Special Design

Note: Dimension symbols conforming to ISO13399. See pages PR3-PR6 for details.

Inch		Diameter of Inscribed Circle (inch)	Metric						
I.C. .250" and over	I.C. under .250"		R	W	V	D	C	S	T
	1.2 (5)	.156		**02**		**04**	**03**	**03**	**06**
	1.5 (6)	.187		**L3**	**08**	**05**	**04**	**04**	**08**
	1.8 (7)	.219		**03**	**09**	**06**	**05**	**05**	**09**
2		.250		**04**	**11**	**07**	**06**	**06**	**11**
2.5		.313		**05**	**13**	**09**	**08**	**07**	**13**
3		.375	**09**	**06**	**16**	**11**	**09**	**09**	**16**
4		.500	**12**	**08**	**22**	**15**	**12**	**12**	**22**

⑥ Symbol for Insert Size



Thickness is from the bottom of the insert to the top of the cutting edge.

Inch		Thickness (inch)	Metric
I.C. .250" and over	I.C. under .250"		
–	**0.9**	.055	**S1**
–	**1**	.063	**01**
–	**1.1**	.070	**T0**
–	**1.5**	.094	**02**
–	**1.8**	.109	**T2**
2	–	.125	**03**
2.5	–	.156	**T3**
3	–	.187	**04**

⑦ Symbol for Insert Thickness

⑥	⑦					
4	**3**	**1**	**GA**	**WS**	**2**	
12	**04**	**04** ⑧	**GA** ⑨	**WS** ⑩	**2** ⑪	

⑧ Symbol for Insert Corner Configuration

Inch	Corner Radius (inch)	Metric
0.5	.008	**02**
1	.016	**04**
2	.031	**08**
3	.047	**12**
4	.063	**16**

⑨ Application (Honing)

F FA FS FN	Continuous Cutting
G GA GS GN	General Cutting
T TA TS TN	Interrupted Cutting

Please refer to page B011 for further information.

⑩ Wiper

WS	With Wiper (For low rigidity work)
No mark	Without Wiper

⑪ Number of Tips

2	2
3	3
⋮	⋮
No mark	1

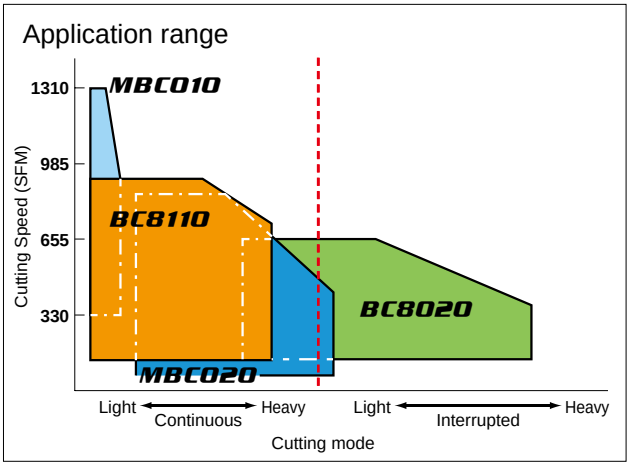
COATED CBN SERIES

NEW BC8110 / BC8020 / MBC010 / MBC020

FEATURES

With the expansion of BC8110, Mitsubishi can offer 4 coated CBN grades for machining of hardened steels. These 4 coated CBN grades cover a wide range of applications.

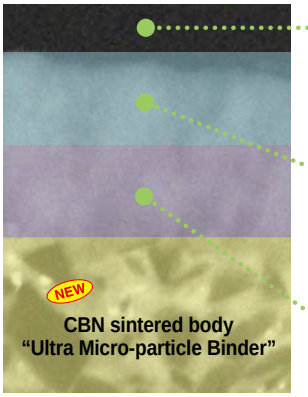
To achieve longer tool life, Mitsubishi uses a unique "Particle-activated Sintering Method", combined with increased cutting edge strength. With high crater wear resistance CBN grades and a wear resistant ceramic coatings, longer tool life and improved machine efficiency are obtained.



NEW BC8110

MIRACLE SIGMA

Newly developed special ceramic coating



Prevention of welding

Peeling of the coating is prevented by improving welding resistance.

NEW TiAlSiN Coating

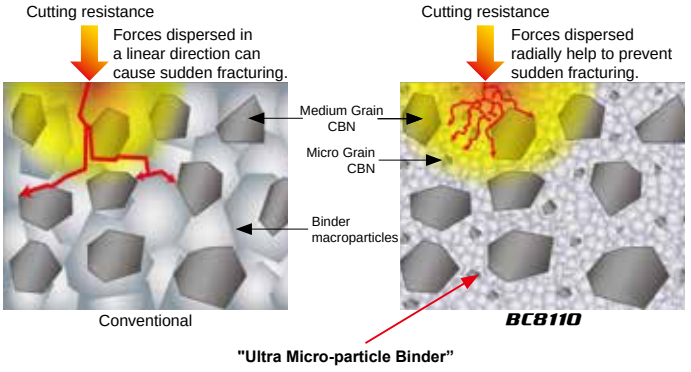
Improved wear and chipping resistance.

TiAlN Coating

Improved adhesion to the CBN surface provides increased peeling resistance.

The newly developed "Ultra Micro-particle Binder" prevents sudden fracture

Dispersal of the new Ultra Micro-particle Binder in BC8110 prevents linear crack development that can cause sudden fracturing.



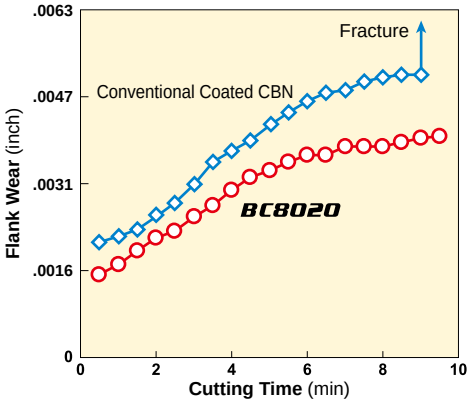
BC8110 is constantly stable without any cutting edge chipping and abnormal damage of the coating.

Grade	Grade Features and Application	Main Component	Coating Layer
NEW BC8110	**Coated CBN for continuous cutting** Newly developed Ultra Micro-particle Binder is consistent with wear resistance and cutting edge strength. Ultra Micro-particle Binder provides protection by means of dual-layer ceramic coating film based on special CBN and TiAlSiN + TiAlN. As a result, it exhibits excellent wear resistance, high coating adhesive strength and performs long-term stable cutting.	CBN(Medium Grain) TiN Al_2O_3	TiAlSiN/ TiAlN Dual-layer
BC8020	High efficiency coated CBN Incleased cutting edge strength and high crater wear resistant CBN grade in combination with a highly wear resistant TiAlN coating, results in longer tool life and improved machining efficiency under heavy duty or interrupting cutting.	CBN(Medium Grain) TiN Al_2O_3	TiAlN
MBC020	Coated CBN for general cutting Uses a CBN substrate that has high cutting edge toughness. The TiAlN based coating delivers superb wear resistance. It covers a wide range of applications from continuous to light interrupted cutting.	CBN (Micro Grain) TiN Al_2O_3	TiAlN
MBC010	Coated CBN for High Speed Continuous Cutting MBC010 makes the best use of special ceramic binder structure, resulting in high wear resistance. This enables continuous machining at high speed of over 985 SFM.	CBN (Micro Grain) TiN Al_2O_3	TiN

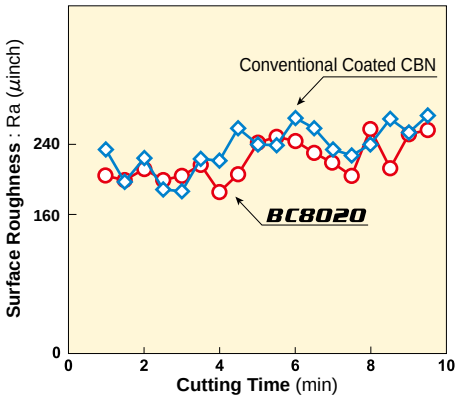
BC8020

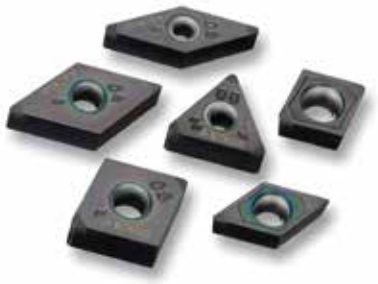
Continuous Cutting

WEAR RESISTANCE



SURFACE ROUGHNESS

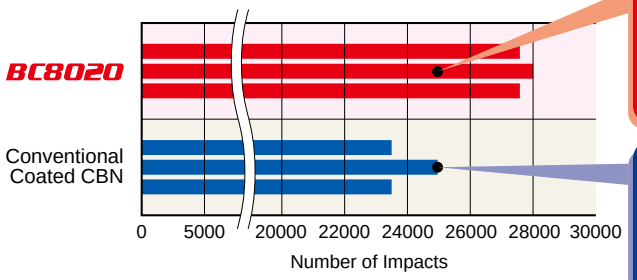




<Cutting Condition>
Workpiece : Hardened Steel (60HRC) Insert : NP-CNGA432-GA2
Cutting Speed : 490SFM Feed : .006IPR Depth of Cut : .020inch
Dry Continuous Cutting

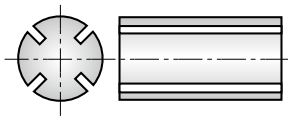
Interrupted Cutting (Crater wear)

FRACTURE RESISTANCE



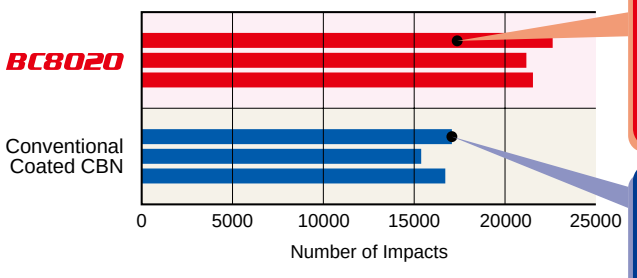


<Cutting Conditions>
Workpiece : Hardened Steel (60HRC)
Medium Interrupted Cutting
Insert : NP-CNGA432-GA2
Cutting speed : 490SFM
Feed : .006IPR
Depth of Cut : .006inch
Dry Interrupted Cutting



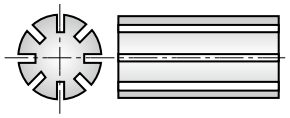
Interrupted Cutting (Chipping)

FRACTURE RESISTANCE





<Cutting Conditions>
Workpiece : Hardened Steel (60HRC)
Heavy Interrupted Cutting
Insert : NP-CNGA432-GA2
Cutting speed : 490SFM
Feed : .008IPR
Depth of Cut : .0079inch
Dry Interrupted Cutting

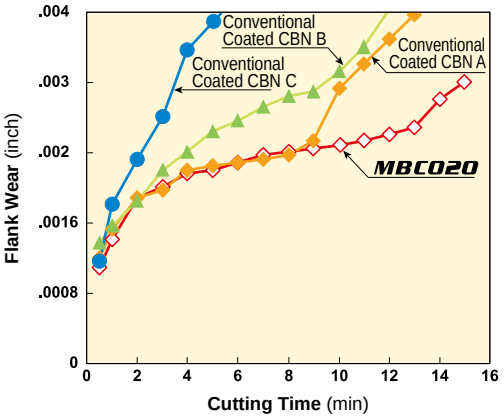


BC8020 exhibits excellent cutting performance for severe or interrupted machining.

MBC020

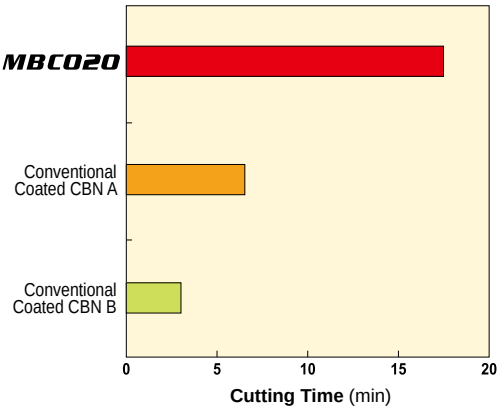


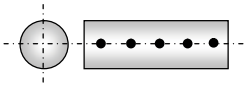
WEAR RESISTANCE



<Cutting Conditions>
Workpiece : Hardened Steel (60HRC)
Insert : NP-CNGA432-GA4
Cutting speed : 720SFM
Feed : .004IPR
Depth of Cut : .004inch
Dry Continuous Cutting

TOUGHNESS





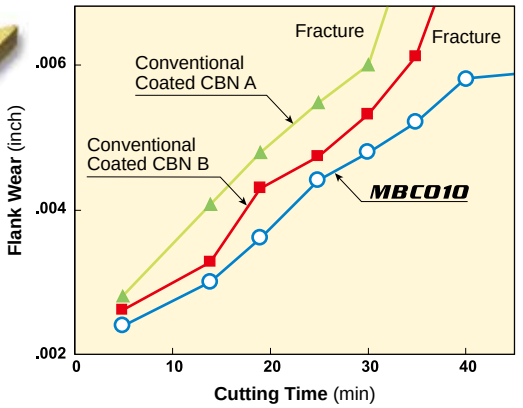
<Cutting Conditions>
Workpiece : Hardened Steel (60HRC)
Insert : NP-CNGA432-GA2
Cutting speed : 390SFM
Feed : .006IPR
Depth of Cut : .006inch
Dry Interrupted Cutting

MBC020 exhibits excellent cutting performance for a wide range of applications from continuous through interrupted machining.

MBC010

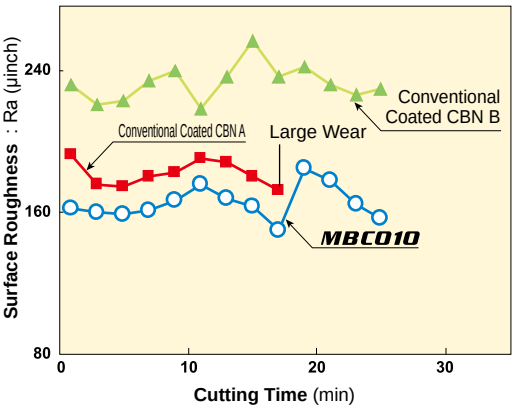


WEAR RESISTANCE



<Cutting Conditions>
Workpiece : Hardened Steel (60HRC)
Insert : NP-CNGA432-GS2
Cutting speed : 985SFM
Feed : .002IPR
Depth of Cut : .004inch
Dry Continuous Cutting

SURFACE ROUGHNESS



<Cutting Conditions>
Workpiece : Hardened Steel (60HRC)
Insert : NP-CNGA432-GS2
Cutting speed : 490SFM
Feed : .006IPR
Depth of Cut : .008inch
Dry Continuous Cutting

MBC010 employs TiN based coating for superior, consistent surface finishes.

UNCOATED CBN SERIES

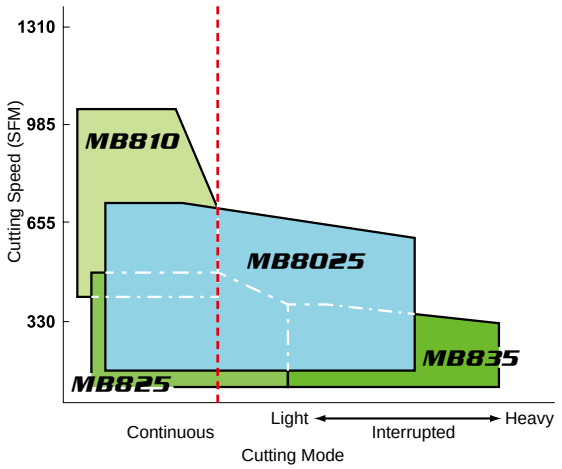
FEATURES

- CBN tool material is produced by mixing the primary component CBN (cubic boron nitride), which has a hardness second only to diamond, with a special ceramic or metal binder. It is then sintered at a pressure of over 5GPa and at a temperature of 2192°F or higher.
- CBN has lower affinity to iron than diamond. The low affinity and high hardness properties means that sintered CBN delivers superior cutting performance especially during high speed machining of materials such hardened steel, cast iron and sintered alloys.



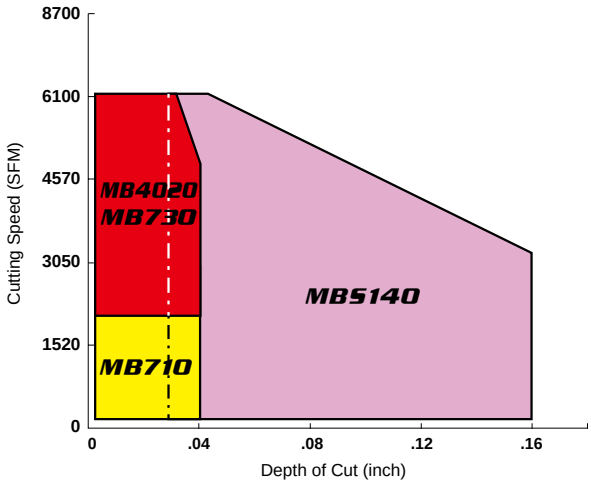
HARDENED STEEL MACHINING

Grade	Grade Features and Application	Main Component
MB8025	General Purpose Turning By employing a "Particle-activated Sintering Method", the new sintered CBN technology is recommended for continuous cutting from medium to high speeds.	CBN (Coarse grain) TiN Al_2O_3
MB810	For High Speed Continuous Cutting It features improved wear resistance due to impregnation with larger CBN particles.	CBN (Micro Grain) TiN Al_2O_3
MB825	For Continuous to Medium Interrupted Cutting Excellent balance of wear resistance and fracture resistance due to introduction of micro-grain CBN particles.	CBN (Micro Grain) TiN Al_2O_3
MB835	For Heavy Interrupted Cutting Improved grade employing micro-grain CBN particles. Excellent fracture resistance for use in heavy interrupted cutting.	CBN (Micro Grain) TiN Al_2O_3



CAST IRON MACHINING

Grade	Grade Features and Application	Main Component
MB710	For General Cutting General purpose grade with well balanced wear and fracture resistance.	CBN TiC Al_2O_3
MB730	For Continuous Through Interrupted Cutting Uses a metallic binder improving the overall fracture resistance.	CBN Co Base Alloy
MB4020	For High Speed Continuous Through Interrupted Cutting Has the larger CBN content and therefore displays good thermal conductivity. From high-speed cutting to interrupted cutting are possible.	CBN (High Content) Co Base Alloy
MB5140	Large Depth of Cutting High Efficiency Solid CBN therefore no restriction on depth of cut enabling high machining efficiency.	CBN AlN (Solid)
MB5015	MB5015 is exclusive grade for boring of Centrifugal casting Cylinder liners in semi finishing or finishing applications with high with high wear resistance.	



MB5015 For Cylinder liners

※Produced to order only

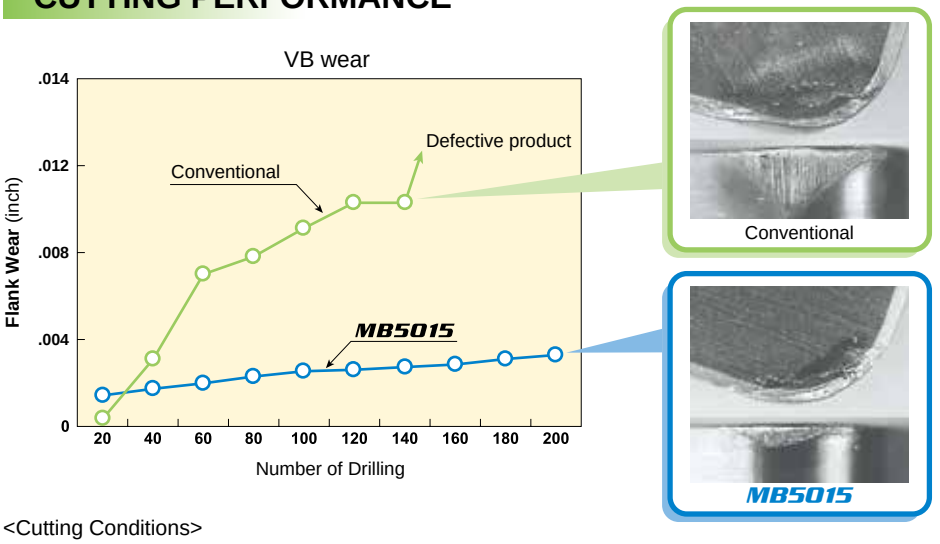
FEATURES

●MB5015 is exclusive grade for boring of Centrifugal casting Cylinder liners in semi finishing or finishing applications with high wear resistance.

RECOMMENDED CUTTING CONDITIONS

Work Material		Cutting Mode	Cutting Speed (SFM) 330 1640 3280 4920	Feed (inch/rev)	Depth of Cut (inch)	Coolant
Centrifugal casting	Cast Iron	Continuous cutting		0–.012(Finishing) 0–.031(Semi-finishing)	0–.002(Finishing) 0–.008(Semi-finishing)	Wet

CUTTING PERFORMANCE



<Cutting Conditions>
Workpiece : FC200(Centrifugal casting)ϕ63.0
Cutting Speed : 2625SFM Feed : .014IPR Depth of Cut : .0012inch
Work : Centrifugal casting Cylinder liner Hole Depth : 4inch

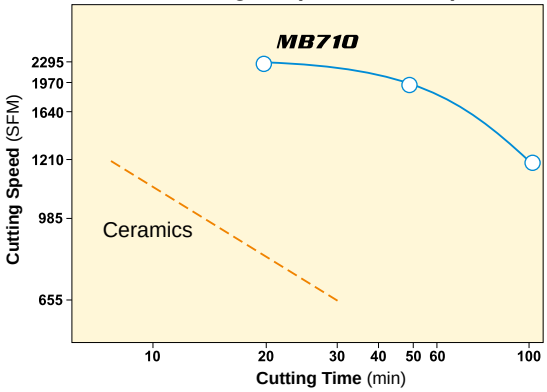
CAST IRON MACHINING

Grade	Grade Features and Application	Main Component
MB710	For General Cutting General purpose grade with well balanced wear and fracture resistance.	CBN TiC Al_2O_3
MB730	For Continuous Through Interrupted Cutting Uses a metallic binder improving the overall fracture resistance.	CBN Co Base Alloy
MB4020	For High Speed Continuous Through Interrupted Cutting Has the larger CBN content and therefore displays good thermal conductivity. From high-speed cutting to interrupted cutting are possible.	CBN (High Content) Co Base Alloy
MB5140	Large Depth of Cutting High Efficiency Solid CBN therefore no restriction on depth of cut enabling high machining efficiency.	CBN AIN (Solid)

CUTTING PERFORMANCE

Continuous Cutting

V-T Diagram (VB=.0039inch)



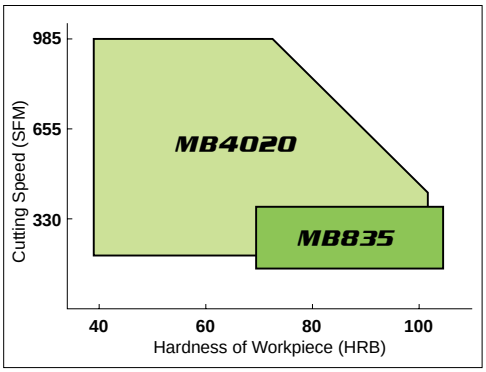
<Cutting Condition of MB710>
Workpiece : AISI-35
Insert : NP-TNGA332-GS3
Feed : .004IPR
Depth of Cut : .0059inch
Wet Cutting

<Cutting Condition of Ceramics>
Workpiece : AISI-35
Insert : NP-TNGA332-GS3
Feed : .004IPR
Depth of Cut : .0039inch
Dry Cutting

MB4020 SINTERED ALLOY MACHINING



FEATURES



High cutting edge strength

Newly developed special binder provides high cutting edge strength. Burrs and plasticity characteristics must be suppressed in interrupted cutting of sintered alloy machining. Extremely superior work accuracy is realized because MB4020 allows selection of a sharper cutting shape to perform its high cutting edge strength.

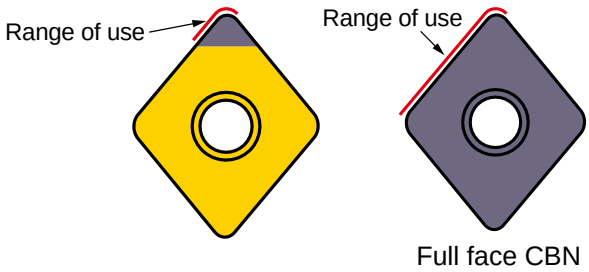
Excellent welding resistance

There is almost no welding to the tool cutting edge because the stable CBN contents is high. Work cutting dimensional accuracy is stable.

NEW

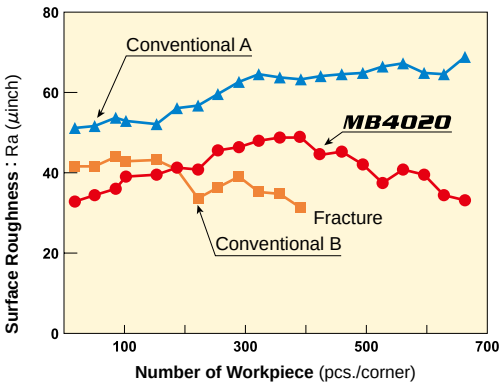
Full face CBN

Full face CBN insert can be used for chamfering that use higher depth of cut.



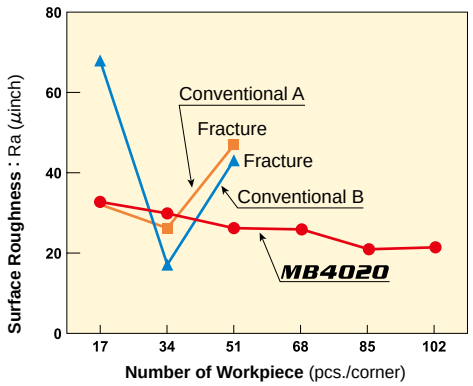
CUTTING PERFORMANCE

Continuous Cutting of High Density Sintered Alloy



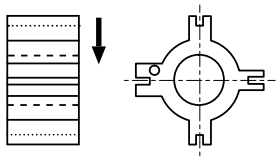
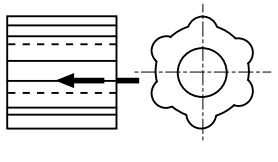
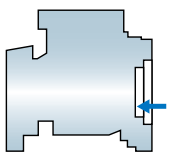
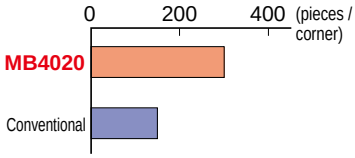
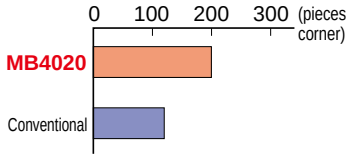
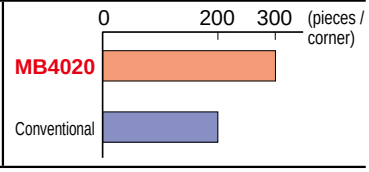
<Cutting Conditions>
Workpiece : High Strength Sintered Alloy Insert : NP-CNGA432-FS2
Cutting Speed : 620SFM Feed : .006IPR
Depth of Cut : .004inch
Wet Cutting

Continuous Cutting of Sintered Alloy



<Cutting Conditions>
Workpiece : Sintered Alloy Insert : NP-CNGA432-FS2
Cutting Speed : 330SFM Feed : .006IPR
Depth of Cut : .004inch
Wet Cutting

APPLICATION EXAMPLE

Insert		NP-TNGA331-FS3	NP-TPGX1.51.51-FS3	CCGW060204FS
Workpiece		 Carburized and quenched alloy	 Carburized and quenched alloy	 Gray Cast Iron No 35 B
Component		Variable valve parts	Oil pump parts	Crankcase
Cutting Condition	Cutting Speed (SFM)	820	330	1220→1370
	Feed (IPR)	.004	.0012	.0012→.0146
	Depth of Cut (inch)	.008	.002	.0051
Results				

CBN



- Suitable for high speed finishing of heat treated steel, sintered ferrous alloy and cast iron.
- Low affinity to iron, thus good surface finishes are possible.
- Present grinding processes can now be machined reducing cost and time.

SELECTION STANDARD

Heat Treated Steel

Work Material		Type	Cutting Mode	Recommended Grade	Recommended Cutting Condition		
					Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
Structural Steel High Alloy Steel	35—65 HRC	Coated	High speed finish cutting	**MBC010**	820 (490—1310)	0—.008	0—.008
			Continuous cutting for general purpose	**MBC020**	655 (260—820)	0—.008	0—.012
			Continuous cutting	**BC8110**	655 (330—985)	0—.008	0—.012
			Heavy interrupted cutting for general purpose	**BC8020**	655 (260—820)	0—.012	0—.030
			Interrupted cutting for general purpose		490 (195—655)	0—.008	0—.012
		Non-coated	Continuous cutting	**MB8025**	590 (260—820)	0—.012	0—.020
			Light interrupted cutting		390 (195—490)	0—.008	0—.012
			High speed finish cutting	**MB810**	655 (490—985)	0—.006	0—.006
			Continuous to medium interrupted cutting	**MB825**	390 (230—490)	0—.012	0—.020
			Interrupted cutting	**MB835**	330 (165—390)	0—.012	0—.020

Cast Iron

Work Material		Workpiece Structure	Cutting Speed (SFM) 820 1640 2460 3280 4100	Feed (IPR)	Depth of Cut (inch)	Coolant
Gray Cast Iron		—	MBS140, MB710, MB730, MB4020	0—.020	0—.039 MBS140 0—.197	Dry,Wet
Alloy Cast Iron		Pearlitic	MB4020	0—.016	0—.020	Dry,Wet
Ductile Cast Iron	60-40-18	Ferritic	MB710	0—.016	0—.020	Dry,Wet
	100-70-03	Ferritic + Pearlitic Pearlitic	MB730			

Sintered Alloy

Work Material	Recommended Grade	Recommended Cutting Condition		
		Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
General Sintered Alloy	**MB4020**	820 (260—985)	0—.008	0—.012
High Density Sintered Alloy	**MB4020**	490 (260—820)	0—.008	0—.012
Sintered Alloy	**MB4020, MB835**	330 (260—490)	0—.008	0—.012

Valve Seat

Amount of Hard Particles	None or Small ← → Large			
Hardness of Workpiece (HV)	150	250	300	350
Plunge Cut	MB4020	MB825	MB835	
Traverse Cut	MB4020	MB710	MB825	

Roll

Work Material	Grade	Recommended Cutting Condition		
		Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
Cast Steel Adamite Cast Steel	**MB825, MB8025**	260 (100—425)	.012 (.004—.020)	.008—.118
Ductile Cast Iron Granular Cast Iron Chilled Cast Iron	**MB710**	260 (100—425)	.012 (.004—.020)	.008—.118
High Chromium Steel High Alloy Steel	**MB825, MB8025**	260 (100—425)	.012 (.004—.020)	.008—.118
High Speed Steel	**MB730**	165 (65—230)	.010 (.004—.020)	.004—.118
Cemented Carbide	**MB730, MBS140**	65 (30—100)	0—.020	0—.008

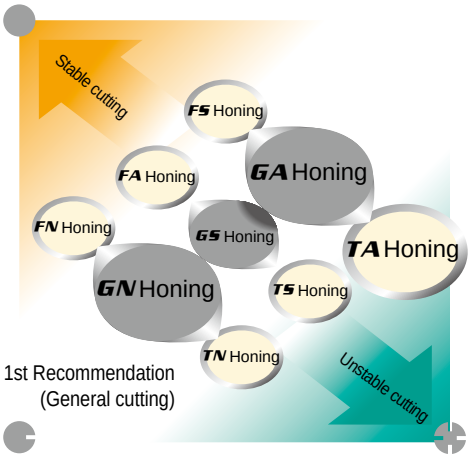
Heat Resistant Alloy

Work Material	Grade	Recommended Cutting Condition		
		Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
Ni Base Alloy	**MB730**	390 (330—490)	0—.008	0—.020
Co Base Alloy	**MB730**	230 (165—330)	0—.008	0—.020

HONING

NEW HONING TYPES

For the CBN **BC8020**, **MBC010** and **MBC020** coated grades, **MB4020** and **MB710/MB730** a wide range of edge honing styles are available to cover a large range of applications and to represent Mitsubishi Materials' unique cutting tool technology.



●General cutting
GA honing is the first recommendation.
GS honing if the depth of cut is .004 inch or more.
GN honing if crater wear is too large.

●Continuous cutting, stable cutting
FA honing to improve the initial machining performance.
FS honing is the first recommendation.
FN honing if crater wear is too large.

●Medium and heavy interrupted cutting, unstable cutting
TA honing is the first recommendation.
TS honing if the depth of cut is .004 inch or more.
TN honing if crater wear is too large.

NP-CNGA431-GA2

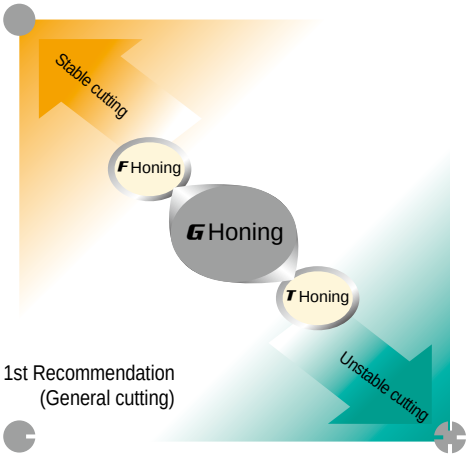
Main Application — Edge Honing Type

EDGE HONING TYPE / MAIN APPLICATION	A For General Purpose Machining (1st recommendation)	S For Anti Chatter (Sharp anti-burr type)	N For Small Depth of Cut (Crater wear resistant)
F For Continuous Machining	FA Honing .004" 15° R0	FS Honing .004" 15° R.0006"	FN Honing .002" 15° R.0006"
G For Continuous – Light Interrupted Machining	GA Honing .005" 25° R.0012"	GS Honing .005" 25° R.0006"	GN Honing .002" 25° R.0006"
T For Interrupted Machining	TA Honing .005" 35° R.0012"	TS Honing .005" 35° R.0006"	TN Honing .002" 35° R.0006"

(Note) First, select the insert edge type from the main application area (F,G,T) then choose honing (A,S,N) that compliments the machining requirement.

CONVENTIONAL HONING TYPES

Other than the new honing types, the three conventional honing types, **F**, **G** and **T** types are available for use in accordance to the machining application.



NP-CNMA431-G2

Honing Type

F HONING For stable continuous cutting.	.004" 15° R0
G HONING For general purpose cutting. (Including light to medium interrupted cutting).	.005" 25° R.0012"
T HONING For medium to heavy interrupted cutting.	.005" 35° R.0012"

CBN GROOVING SERIES
(GY)

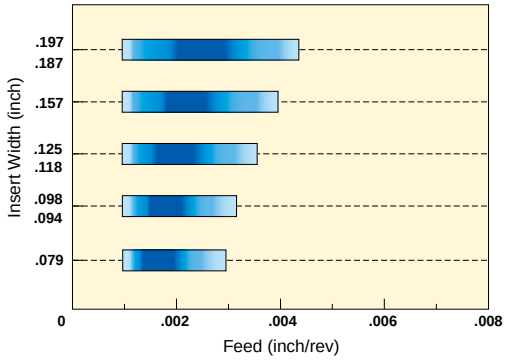


FEATURES

Combined with a High-rigidity Holder Ensures High Accuracy and Long Tool Life.

Holder rigidity is essential when grooving hardened steel.
The GY series Tri Lock system offers high rigidity equivalent to a 1-piece type tool holder despite being a modular system.

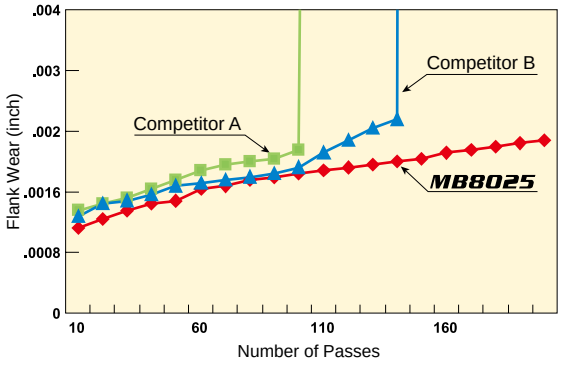
RECOMMENDED CUTTING CONDITIONS



Work Material		Hardness	Grade	Cutting Speed (SFM)	Coolant
H	Hardened Steel	35—65HRC	**MB8025**	330 (195—390)	Dry,Wet

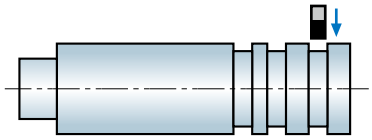
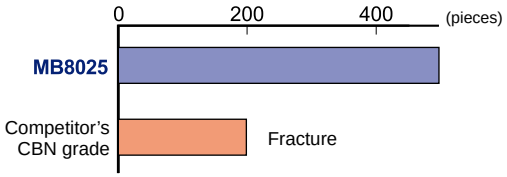
CUTTING PERFORMANCE

Tool life



<Cutting Conditions>
Workpiece : Hardened Steel (HRC60)
Cutting Speed : 390SFM
Feed : .004IPR
Depth of Cut : .014inch
Dry Cutting

APPLICATION EXAMPLE

Insert		**GY1G0300F020N-GFGS** (Grade : **MB8025**)
Workpiece		Transmission shaft (AISI 8620 (HRC58—62)) 
Cutting Conditions	Cutting Speed (SFM)	420
	Feed (IPR)	.004
Result		 GY achieves longer tool life without fracturing.

CBN BREAKER INSERT
(*BM/BF* BREAKER)

FEATURES

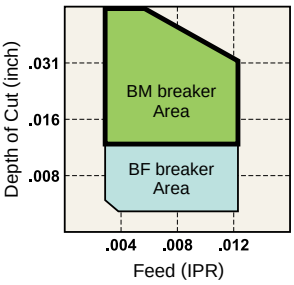
Chip breaker geometry designed for excellent chip control

Radial chip breaker ensures optimization of the cutting point and the chip breaker position.
Enables effective chip discharge even when copy machining and prevents the chips from wrapping around the holder under finish cutting conditions.

Long life coated CBN grade

Combination of Coating grade & Breaker, high efficiency and long tool life in wide variety of applications.

APPLICATION AREA



DEEP CUTTING DEPTH

BM Breaker

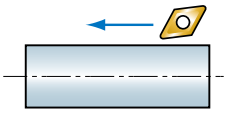


Good for deep depth cutting of carburized layer.

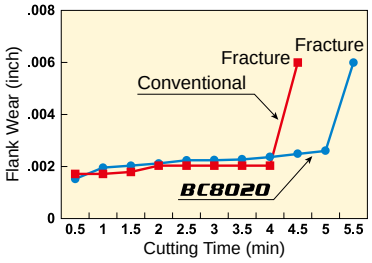
Recommend and under ap=.024 inch

※Available in BC8020 grade.

Cutting Performance



<Cutting Conditions>
Workpiece : Hardened Steel(60HRC)
Insert : BM-CNGM432-TA2
Cutting Speed : 590SFM
Feed : .008IPR
Depth of Cut : .020inch
Dry Cutting



LIGHT CUTTING DEPTH

BF Breaker

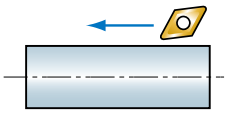


Good for chip removal under light depth and feed cutting.

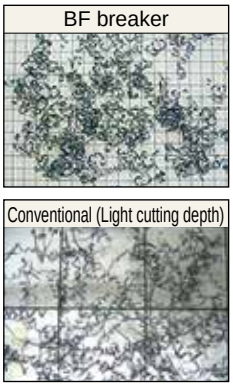
Recommend and under ap=.012 inch

※Available in MBC020 grade.

Cutting Performance



<Cutting Conditions>
Workpiece : Hardened Steel(55HRC)
Insert : BF-CNGG432-TA4
Cutting Speed : 330SFM
Feed : .008IPR
Depth of Cut : .004inch
Dry Cutting



MULTI-CORNER TYPE INSERTS

A single sided, multi-corner type insert has no cutting edges on the 2nd side.
The type of grade is stamped on the 1st side.

Double Sided, multi-corner type insert, ex.

NP-CNGA432-GA4

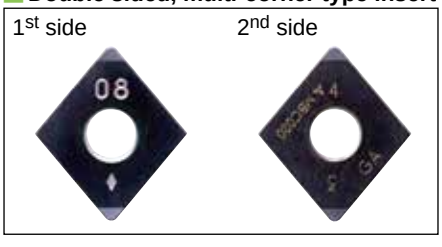
No. of Cutting Edges

Single Sided, multi-corner type insert, ex.

NP-CNGA432-GA2

No. of Cutting Edges

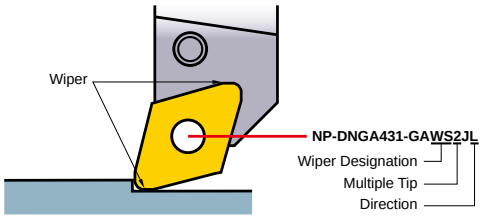
Double sided, multi-corner type insert



WIPER INSERT

What is a Wiper Insert?

- The wiper insert is designed with a wiper edge that is situated where the straight edge meets the corner radius.
- In comparison to conventional inserts, the surface finish does not deteriorate even if the feed rate is doubled.
- Machining at high feed rates improves machining efficiency.



Left hand wiper shown

Improving Surface Finish

Under the same machining conditions as conventional inserts, but with the feed rate increased, the surface finish of the workpiece can be improved.

Improving Efficiency

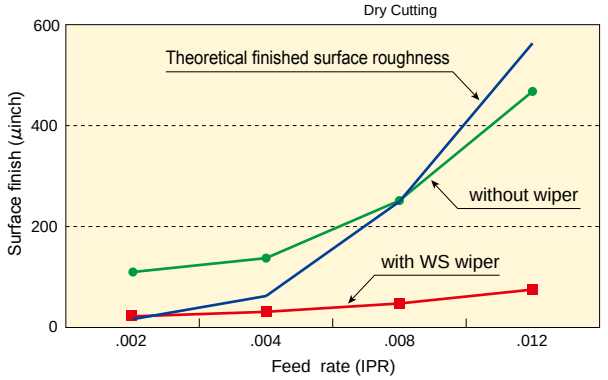
High feed rates not only shorten machining times but also make it possible to combine roughing and finishing operations.

Increased Tool Life

When changing to high feed conditions, the time required to cut one component is decreased, thus more parts can be machined with each insert. In addition, the high feed rate prevents rubbing, therefore, delaying the progression of wear and increasing the tool life of the insert.

Cutting Performance

<Cutting Conditions>
Workpiece : Hardened steel (HRC60)
Insert : NP-CNGA432-○○○
Cutting Speed : 390 SFM
Depth of Cut : .004 inch
Dry Cutting



Wiper insert + machining at high feed rates

- Reduced machining time
- Increased production rate
- Improved chip control

Wiper insert + machining at conventional feed rates

- Eliminating the finishing step
  (Combine roughing and finishing into single pass.)

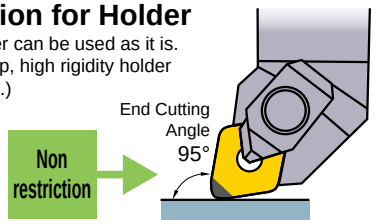
- Reducing cost
- Increased productivity
- Reduced machine down time

<Real cost reduction!!>

Special attention is not necessary when using C-style and W-style inserts

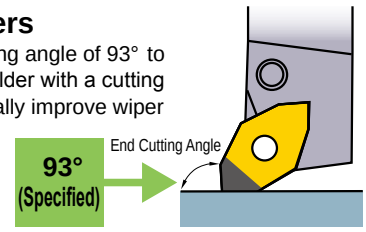
No Restriction for Holder

The standard holder can be used as it is.
(*The double clamp, high rigidity holder is recommended.)

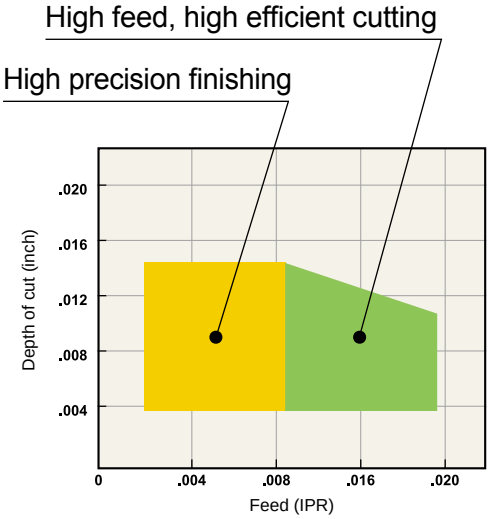


Restriction for Holders

Use a holder with an end cutting angle of 93° to improve wiper efficiency. A holder with a cutting edge angle of 91° can marginally improve wiper efficiency (see the figure below), however, there is no wiper efficiency with other end cutting angles (60°, 90°, 107° etc.).

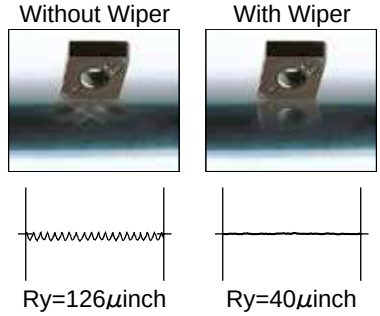


Cutting Conditions and Performance



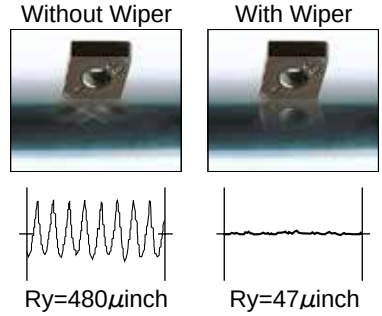
High precision finishing

Cutting speed : 330 SFM Feed : .004 IPR
Depth of cut : .004 inch Dry cutting



High feed, highly efficient cutting

Cutting speed : 330 SFM Feed : .012 IPR
Depth of cut : .004 inch Dry cutting

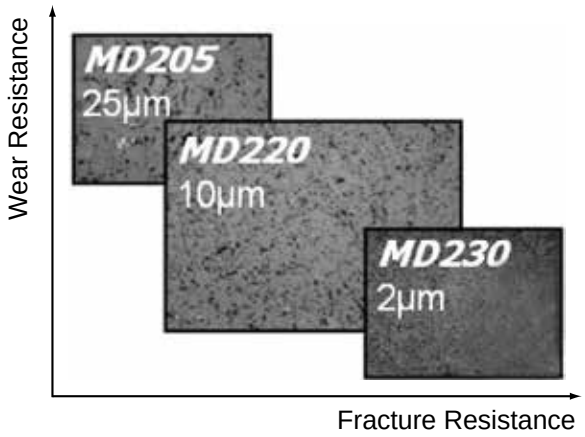


PCD (SINTERED DIAMOND)



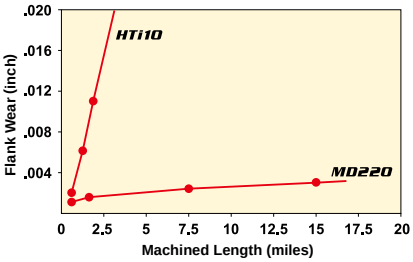
- Suitable for materials such as aluminum alloy, non-ferrous metals, and fiber reinforced plastics.
- Suitable for extremely high speed finishing.

FEATURES



Grade	Features
MD205	Materials focused on wear resistance Coarse grain diamond particles are sintered and wear resistance is excellent. Use when wear resistance with MD220 is insuffi cient.
MD220	Materials for general machining Sintered medium grain diamond particles. Wear resistance and fracture resistance are superbly balanced. Applicable to general finishing of non-ferrous metals, non-metal cutting, and similar machining.
MD230	Materials focused on fracture resistance Fine grain diamond particles are used. Fracture resistance and cutting edge sharpness are excellent. Use when fracture and a high quality finished surface is demanded with MD220.

CUTTING PERFORMANCE



Sintered diamond tool wear for high Si aluminum alloy cutting

<Cutting Conditions>
Workpiece : High Si Aluminum Alloy
Insert : SPG422
vc=655SFM
ap=.059inch
f=.006IPR
Coolant : W.S.O

APPLICATION

Grade		
MD205	**MD220**	**MD230**
Please use when there is insufficient resistance to wear with the MD220.	Apply for general finishing of non-ferrous metals and non-metal cutting.	Please use when a fracture has occured with the MD220 and you desire a high-quality finished surface.

SELECTION STANDARD

TURNING

Work Material	Recommended Grade			Recommended Cutting Condition		
	MD205	MD220	MD230	Recommended Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
Aluminum		◎		3280 (650—4920)	—.008	—.200
Aluminum Alloy (Si ≤ 16%)		◎		2630 (650—3940)	—.008	—.200
Aluminum Alloy (Si ≤ 16%)		○		1970 (650—3280)	—.008	—.118
Copper Alloy		◎		2300 (650—3940)	—.008	—.118
Reinforced Plastic		◎		1970 (330—3280)	—.016	—.079
Glass Fiber Reinforced Plastic		◎		1640 (330—2630)	—.010	—.079
Carbon	○	◎		1210 (330—1970)	—.012	—.079
Ceramics		○		165 (100—260)	—.004	—.079
Hard Rubber		◎		1970 (980—2630)	—.006	—.039
Wood Inorganic Board		◎		4260 (980—12100)	—.016	—
Tungsten Carbide		○		15 (16—65)	—.008	—.020

(Note 1) ◎ : 1st recommendation. ○ : 2nd recommendation.
(Note 2) Not suitable for steel.

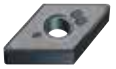
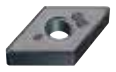
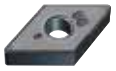
NEW PETIT CUT PCD INSERTS

FEATURES

- **Economical inserts** The small PCD delivers long tool life. Eliminates the need for regrinding, making tool management easier and economical.
- **PCD with chip breaker** Chip breaker formed directly on the PCD portion delivers superior chip control.
- Corner R.002inch inserts are available, making it suitable for the machining of small work corner radii.

CLASSIFICATION

NEGATIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-corner Type Double Sided	G Class	Flat Top	NP-CNGA_○4  B022	NP-DNGA_○4  B024	NP-SNGA_○4  B027	NP-TNGA_○6  B028	NP-VNGA_○4  B030	NP-WNGA_○6  B032
	Multi-corner Type Double Sided With Wiper		Flat Top	NP-CNGA_○WS4  B022					
	Multi-corner Type Double Sided With Breaker		BF	BF-CNGG_○4  B022	BF-DNGG_○4  B024				
	Multi-corner Type Single Sided		Flat Top	NP-CNGA_○2  B022, B023	NP-DNGA_○2  B024, B025	NP-SNGA_○2  B027	NP-TNGA_○3  B028, B029	NP-VNGA_○2  B030	NP-WNGA_○3  B032
	Multi-corner Type Single Sided With Wiper		Flat Top	NP-CNGA_○WS2  B023	NP-DNGA_○WS2JR/L  B025		NP-TNGA_○WS3JR/L  B029		NP-WNGA_○WS3  B032
	Multi-corner Type Single Sided With Breaker		BF		BF-DNGA_○2  B025				
	Multi-corner Type Single Sided With Breaker		BF	BF-CNGM_○2  B023	BF-DNGM_○2  B026				
	Multi-corner Type Single Sided With Breaker		BM	BM-CNGM_○2  B023	BM-DNGM_○2  B026		BM-TNGM_○3  B029		

NEGATIVE INSERTS WITH HOLE

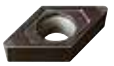
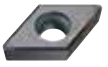
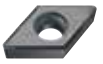
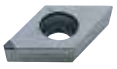
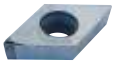
Product Name	Type	Tolerance	Breaker and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	One-corner Type Single Sided	M Class	Flat Top					NP-VNMA_○ B030	
	One-corner Type Single Sided With Breaker		R/L F	NP-CNMM_RF B051	NP-DNMM_RF B051	NP-SNMM_RF B052	NP-TNMM_RF B052	NP-VNMM_RF B053	
STANDARD	NEW Multi-corner Type Double Sided	G Class	Flat Top	CNGA B023		SNGA B027	TNGA B029		
	One-corner Type Single Sided		Flat Top	CNGA B023	DNGA B051	SNGA B027, B052	TNGA B029, B052	VNGA B031, B053	
	One-corner Type Single Sided	M Class	Flat Top	CNMA B023, B051					

5° POSITIVE INSERTS WITH HOLE

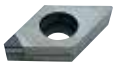
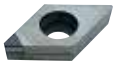
Product Name	Type	Tolerance	Breaker and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-corner Type	G Class	Flat Top					NP-VBGW_○2 B044	
	One-corner Type With Breaker		RF					NP-VBGT_RF B060	

CLASSIFICATION

7° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-corner Type	G Class	Flat Top	NP-CCGW/B_○2  B036	NP-DCGW_○2  B039		NP-TCGW_○3  B041	NP-VCGW_○2  B045	NP-WCGW_○3  B046
	Multi-corner Type With Wiper		Flat Top	NP-CCGW_○WS2  B037					
	Multi-corner Type With Breaker		BF	BF-CCGT_○2  B037	BF-DCGT_○2  B039				
	Multi-corner Type With Breaker		BF	BF-CCGW_○2  B037	BF-DCGW_○2  B040				
	One-corner Type		Flat Top	NP-CCGW/B_○  B036, B037					
	One-corner Type	M Class	Flat Top		NP-DCMW_○  B040				
	One-corner Type		Flat Top	NP-CCMW  B055					
	One-corner Type With Breaker		Breaker	NP-CCMH  B055					
	One-corner Type With Breaker	G Class	RF					NP-VCGT_RF  B060	
	One-corner Type With Breaker	M Class	R/L F		NP-DCMT_R/LF  B056				
STANDARD	NEW Multi-corner Type	G Class	Flat Top	CCGW  B037	DCGW  B040				

7° POSITIVE INSERTS WITH HOLE

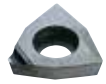
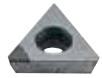
Product Name	Type	Tolerance	Breaker and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
STANDARD	One-corner Type	G Class	Flat Top	CCGW  B037	DCGW  B040		TCGW  B041, B057		
	One-corner Type	M Class	Flat Top	CCMW  B055	DCMW  B056		TCMW  B057		WCMW  B061

11° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-corner Type	G Class	Flat Top	NP-CPGB_○2  B038			NP-TPGB_○3  B042		
	Multi-corner Type		Flat Top				NP-TPGX_○3  B042		
	One-corner Type With Breaker	M Class	Breaker	NP-CPMH  B055					
	One-corner Type With Breaker		R/L F				NP-TPMH_R/LF  B058		
	One-corner Type With Breaker		R/L F				NP-TPMX_R/LF  B058		
	Multi-corner Type		Flat Top						NP-WCMW_○3  B046

CLASSIFICATION

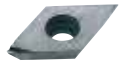
11° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
STANDARD	One-corner Type With Breaker	G Class	Breaker	CPGT  B055					WPGT  B061
STANDARD	One-corner Type	G Class	Flat Top			SPGX  B056	TPGX  B043, B059		
STANDARD	One-corner Type With Breaker	G Class	R/L F				TPGT/V_R/LF  B058, B059		

15° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker and Cross Section	Rhombic 35°
FOR ALUMINUM	One-corner Type With Breaker	G Class	R/L	VDGX_R/LF  B063
FOR ALUMINUM				

20° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker and Cross Section	Rhombic 55°	Triangular 60°
FOR ALUMINUM	One-corner Type With Breaker	G Class	R/L		TEGX_R/L  B062
FOR ALUMINUM	One-corner Type With Breaker	G Class	R/L F	DEGX_R/LF  B062	
FOR ALUMINUM	One-corner Type	G Class	Flat Top		TEGX  B062

NEGATIVE INSERTS WITHOUT HOLE

Product Name	Tolerance	Breaker and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Round
STANDARD	G Class	Flat Top			SNG  B034, B054	TNG  B035	
STANDARD	G Class	Flat Top	CNG  B033	DNG  B033	SNG  B034	TNG  B035	RNG  B034

5° POSITIVE INSERTS WITHOUT HOLE

Product Name	Tolerance	Breaker and Cross Section	Triangular 60°	
STANDARD	G Class	Flat Top	TBG  B049	

11° POSITIVE INSERTS WITHOUT HOLE

Product Name	Tolerance	Breaker and Cross Section	Square 90°	Triangular 60°
STANDARD	G Class	Flat Top	SPG  B048, B064	TPG  B050, B064

SPECIAL PURPOSE INSERTS

Tool Holder Type	Tolerance	Inserts
TL Type	G Class	RTG_A  B047

80° CN TYPE INSERTS WITH HOLE

NP-CNGA 4 3 1 GA4
Size Thickness Corner Radius Honing & Wiper
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN (NEW) BC8110	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Solid CBN MBS140	Applicable Holder Page
NEW PETIT CUT	**NP-CNGA431-GA4**	NP-CNGA120404GA4	.016		●	●										C006 −009 E021 E024 H006 −008
	NP-CNGA**432-GA4**	NP-CNGA120408GA4	.031		●	●										
	NP-CNGA**433-GA4**	NP-CNGA120412GA4	.047		●	★										
NEW	NP-CNGA**431-GS4**	NP-CNGA120404GS4	.016				★									
NEW	NP-CNGA**432-GS4**	NP-CNGA120408GS4	.031				★									
NEW	NP-CNGA**433-GS4**	NP-CNGA120412GS4	.047				★									
	NP-CNGA**431-GN4**	NP-CNGA120404GN4	.016		★											
	NP-CNGA**432-GN4**	NP-CNGA120408GN4	.031		★											
	NP-CNGA**433-GN4**	NP-CNGA120412GN4	.047		★											
	NP-CNGA**431-FS4**	NP-CNGA120404FS4	.016			★	★									
	NP-CNGA**432-FS4**	NP-CNGA120408FS4	.031			★	★									
	NP-CNGA**433-FS4**	NP-CNGA120412FS4	.047			★	★									
	NP-CNGA**431-TA4**	NP-CNGA120404TA4	.016		★	★										
	NP-CNGA**432-TA4**	NP-CNGA120408TA4	.031		★	★										
	NP-CNGA**433-TA4**	NP-CNGA120412TA4	.047		★	★										
NEW	NP-CNGA**431-TS4**	NP-CNGA120404TS4	.016				●									
NEW	NP-CNGA**432-TS4**	NP-CNGA120408TS4	.031				●									
NEW	NP-CNGA**433-TS4**	NP-CNGA120412TS4	.047				●									
NEW PETIT CUT (With Wiper)	★1 **NP-CNGA431-GAWS4**	NP-CNGA120404GAWS4	.016			★										C006 −009 E021 E024 H006 −008
	★1 NP-CNGA**432-GAWS4**	NP-CNGA120408GAWS4	.031			●										
	★1 NP-CNGA**433-GAWS4**	NP-CNGA120412GAWS4	.047			●										
NEW	★1 NP-CNGA**431-GSWS4**	NP-CNGA120404GSWS4	.016				●									
NEW	★1 NP-CNGA**432-GSWS4**	NP-CNGA120408GSWS4	.031				●									
NEW	★1 NP-CNGA**433-GSWS4**	NP-CNGA120412GSWS4	.047				●									
NEW PETIT CUT	**BF-CNGG431-TA4**	BF-CNGG120404TA4	.016		★											C006 −009 E021 E024 H006 −008
	BF-CNGG**432-TA4**	BF-CNGG120408TA4	.031		★											
(With breaker)	BF-CNGG**433-TA4**	BF-CNGG120412TA4	.047		★											
NEW PETIT CUT	**NP-CNGA431-GA2**	NP-CNGA120404GA2	.016		●	●			●							C006 −009 E021 E024 H006 −008
	NP-CNGA**432-GA2**	NP-CNGA120408GA2	.031		●	●			●							
	NP-CNGA**433-GA2**	NP-CNGA120412GA2	.047		●	●			●							
NEW	NP-CNGA**430.5-GS2**	NP-CNGA120402GS2	.008				○									
	NP-CNGA**431-GS2**	NP-CNGA120404GS2	.016	●			●		●			●	●	●		
	NP-CNGA**432-GS2**	NP-CNGA120408GS2	.031	●			●		●			●	●	●		
	NP-CNGA**433-GS2**	NP-CNGA120412GS2	.047	●			●		●			●	●	●		
	NP-CNGA**431-GN2**	NP-CNGA120404GN2	.016		●											
	NP-CNGA**432-GN2**	NP-CNGA120408GN2	.031		●											
	NP-CNGA**433-GN2**	NP-CNGA120412GN2	.047		●											
NEW	NP-CNGA**430.5-FS2**	NP-CNGA120402FS2	.008				○									

★1 Please refer to page B014 before using the wiper insert.

■ = MIRACLE SIGMA

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN				CBN							Solid CBN	Applicable Holder Page
				MBC010	MBC020	BC8020	BC8110 (NEW)	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	MBS140	
NEW PETIT CUT	**NP-CNGA431-FS2**	NP-CNGA120404FS2	.016			★	●		●			●		●		C006 −009 E021 E024 H006 −008
	NP-CNGA**432-FS2**	NP-CNGA120408FS2	.031		○	★	●		●			●		●		
	NP-CNGA**433-FS2**	NP-CNGA120412FS2	.047		○	★	●		●			●		●		
	NP-CNGA**431-TA2**	NP-CNGA120404TA2	.016		●	★			●		●		●			
	NP-CNGA**432-TA2**	NP-CNGA120408TA2	.031		●	★			●		●		●			
	NP-CNGA**433-TA2**	NP-CNGA120412TA2	.047		●	★			●		●		●			
	NP-CNGA**431-TS2**	NP-CNGA120404TS2	.016				★							●		
	NP-CNGA**432-TS2**	NP-CNGA120408TS2	.031				★							●		
	NP-CNGA**433-TS2**	NP-CNGA120412TS2	.047				★							●		
	NP-CNGA**432-G2**	NP-CNGA120408G2	.031						★							
NEW PETIT CUT (With Wiper)	★1 **NP-CNGA431-GAWS2**	NP-CNGA120404GAWS2	.016		●				▲							C006 −009 E021 E024 H006 −008
	★2 NP-CNGA**432-GAWS2**	NP-CNGA120408GAWS2	.031		●	●			▲							
	★2 NP-CNGA**433-GAWS2**	NP-CNGA120412GAWS2	.047		●	●			▲							
	★2 NP-CNGA**431-GSWS2**	NP-CNGA120404GSWS2	.016	★			●									
	★2 NP-CNGA**432-GSWS2**	NP-CNGA120408GSWS2	.031	●	○	○	●					○	○			
	★2 NP-CNGA**433-GSWS2**	NP-CNGA120412GSWS2	.047	★	○	○	●		○							
	(NEW) ★2 NP-CNGA**432-FSWS2**	NP-CNGA120408FSWS2	.031		○		○		○							
	(NEW) ★2 NP-CNGA**433-FSWS2**	NP-CNGA120412FSWS2	.047		○		○		○							
NEW PETIT CUT	**BF-CNGM431-TA2**	BF-CNGM120404TA2	.016		●											C006 −009 E021 E024 H006 −008
	BF-CNGM**432-TA2**	BF-CNGM120408TA2	.031		●											
	BF-CNGM**433-TA2**	BF-CNGM120412TA2	.047		●											
	(NEW) BF-CNGM**431-TS2**	BF-CNGM120404TS2	.016				★									
	(NEW) BF-CNGM**432-TS2**	BF-CNGM120408TS2	.031				★									
(With breaker)	(NEW) BF-CNGM**433-TS2**	BF-CNGM120412TS2	.047				★									
NEW PETIT CUT	**BM-CNGM432-TA2**	BM-CNGM120408TA2	.031			★										C006 −009 E021 E024 H006 −008
(With breaker)	BM-CNGM**433-TA2**	BM-CNGM120412TA2	.047			★										
	CNGA432	CNGA120408	.031						●			●	●			C006 −009 E021 E024 H006 −008
	CNGA**433**	CNGA120412	.047						●			●	●			
(NEW)	**CNGA432**	CNGA120408	.031												●	C006 −009 E021 E024 H006 −008
	CNGA**433**	CNGA120412	.047												●	
	CNMA431	CNMA120404	.016					★								C006 −009 E021 E024 H006 −008

★1 This order number is for "10 inserts in one case" package.
★2 Please refer to page B014 before using the wiper insert.

■ = MIRACLE SIGMA

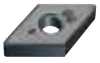
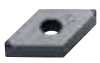
IDENTIFICATION ➤ B002
HONING ➤ B011

55° DN TYPE INSERTS WITH HOLE

NP-DNGA 4 3 1 GA4
Size Thickness Corner Radius Honing & Wiper
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
H	Hardened Materials	
K	Cast Iron	
S	Heat-resistant Alloy, Titanium Alloy	
	Sintered Alloy	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN BC8110 (NEW)	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Solid CBN MBS140	Applicable Holder Page
NEW PETIT CUT	**NP-DNGA431-GA4**	NP-DNGA150404GA4	.016		●	★										C010 −012 E021 E024 H009 −011
	NP-DNGA**432-GA4**	NP-DNGA150408GA4	.031		●	★										
	NP-DNGA**433-GA4**	NP-DNGA150412GA4	.047		●	★										
NEW	NP-DNGA**431-GS4**	NP-DNGA150404GS4	.016				★									
NEW	NP-DNGA**432-GS4**	NP-DNGA150408GS4	.031				★									
NEW	NP-DNGA**433-GS4**	NP-DNGA150412GS4	.047				★									
NEW	NP-DNGA**441-GS4**	NP-DNGA150604GS4	.016				○									
NEW	NP-DNGA**442-GS4**	NP-DNGA150608GS4	.031				○									
NEW	NP-DNGA**443-GS4**	NP-DNGA150612GS4	.047				○									
	NP-DNGA**431-GN4**	NP-DNGA150404GN4	.016		★											
	NP-DNGA**432-GN4**	NP-DNGA150408GN4	.031		★											
	NP-DNGA**433-GN4**	NP-DNGA150412GN4	.047		★											
	NP-DNGA**431-FS4**	NP-DNGA150404FS4	.016			★	★									
	NP-DNGA**432-FS4**	NP-DNGA150408FS4	.031			★	★									
	NP-DNGA**433-FS4**	NP-DNGA150412FS4	.047			★	★									
NEW	NP-DNGA**441-FS4**	NP-DNGA150604FS4	.016				○									
NEW	NP-DNGA**442-FS4**	NP-DNGA150608FS4	.031				○									
NEW	NP-DNGA**443-FS4**	NP-DNGA150612FS4	.047				○									
	NP-DNGA**431-TA4**	NP-DNGA150404TA4	.016		★	★										
	NP-DNGA**432-TA4**	NP-DNGA150408TA4	.031		★	★										
	NP-DNGA**433-TA4**	NP-DNGA150412TA4	.047		★	★										
NEW	NP-DNGA**431-TS4**	NP-DNGA150404TS4	.016				★									
NEW	NP-DNGA**432-TS4**	NP-DNGA150408TS4	.031				★									
NEW	NP-DNGA**433-TS4**	NP-DNGA150412TS4	.047				★									
NEW	NP-DNGA**441-TS4**	NP-DNGA150604TS4	.016				○									
NEW	NP-DNGA**442-TS4**	NP-DNGA150608TS4	.031				○									
NEW	NP-DNGA**443-TS4**	NP-DNGA150612TS4	.047				○									
NEW PETIT CUT	**BF-DNGG431-TA4**	BF-DNGG150404TA4	.016		★											C010 −012 E021 E024 H009 −011
 (With breaker)	BF-DNGG**432-TA4**	BF-DNGG150408TA4	.031		★											
	BF-DNGG**433-TA4**	BF-DNGG150412TA4	.047		★											
NEW PETIT CUT	**NP-DNGA332-GA2**	NP-DNGA110408GA2	.031		●	●			○							C010 −012 E021 E024 H009 −011
	NP-DNGA**431-GA2**	NP-DNGA150404GA2	.016		●	●			●							
	NP-DNGA**432-GA2**	NP-DNGA150408GA2	.031		●	●			●							
	NP-DNGA**433-GA2**	NP-DNGA150412GA2	.047		●	●			●							
	NP-DNGA**332-GS2**	NP-DNGA110408GS2	.031	●												
NEW	NP-DNGA**430.5-GS2**	NP-DNGA150402GS2	.008				○									
	NP-DNGA**431-GS2**	NP-DNGA150404GS2	.016	●			●					●	●			
	NP-DNGA**432-GS2**	NP-DNGA150408GS2	.031	●			●					●	●			

■ = MIRACLE SIGMA

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan.
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN (NEW) BC8110	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Solid CBN MBS140	Applicable Holder Page
NEW PETIT CUT	**NP-DNGA433-GS2**	NP-DNGA150412GS2	.047	●			●					●	●			C010 −012 E021 E024 H009 −011
	(NEW) NP-DNGA**441-GS2**	NP-DNGA150604GS2	.016				○									
	(NEW) NP-DNGA**442-GS2**	NP-DNGA150608GS2	.031				○									
	(NEW) NP-DNGA**443-GS2**	NP-DNGA150612GS2	.047				○									
	NP-DNGA**332-GN2**	NP-DNGA110408GN2	.031		●											
	NP-DNGA**431-GN2**	NP-DNGA150404GN2	.016		●											
	NP-DNGA**432-GN2**	NP-DNGA150408GN2	.031		●											
	NP-DNGA**433-GN2**	NP-DNGA150412GN2	.047		●											
	(NEW) NP-DNGA**430.5-FS2**	NP-DNGA150402FS2	.008				○									
	NP-DNGA**431-FS2**	NP-DNGA150404FS2	.016			★	●		●					●		
	NP-DNGA**432-FS2**	NP-DNGA150408FS2	.031			★	●		●					●		
	NP-DNGA**433-FS2**	NP-DNGA150412FS2	.047			★	●		●					●		
	(NEW) NP-DNGA**441-FS2**	NP-DNGA150604FS2	.016				○									
	(NEW) NP-DNGA**442-FS2**	NP-DNGA150608FS2	.031				○									
	(NEW) NP-DNGA**443-FS2**	NP-DNGA150612FS2	.047				○									
	NP-DNGA**332-TA2**	NP-DNGA110408TA2	.031		●											
	NP-DNGA**431-TA2**	NP-DNGA150404TA2	.016		●	★			●		●					
	NP-DNGA**432-TA2**	NP-DNGA150408TA2	.031		●	★			●		●					
	NP-DNGA**433-TA2**	NP-DNGA150412TA2	.047		●	★			●		●					
	NP-DNGA**431-TS2**	NP-DNGA150404TS2	.016				★							●		
	NP-DNGA**432-TS2**	NP-DNGA150408TS2	.031				★							●		
	NP-DNGA**433-TS2**	NP-DNGA150412TS2	.047				★							●		
	(NEW) NP-DNGA**441-TS2**	NP-DNGA150604TS2	.016				○									
	(NEW) NP-DNGA**442-TS2**	NP-DNGA150608TS2	.031				○									
	(NEW) NP-DNGA**443-TS2**	NP-DNGA150612TS2	.047				○									
NEW PETIT CUT (With Wiper)	✶1 **NP-DNGA431-GAWS2JR**	NP-DNGA150404GAWS2JR	.016						★							C010 −012 E021 E024 H009 −011
	✶1 NP-DNGA**431-GAWS2JL**	NP-DNGA150404GAWS2JL	.016						★							
	✶1 NP-DNGA**432-GAWS2JR**	NP-DNGA150408GAWS2JR	.031						★							
	✶1 NP-DNGA**432-GAWS2JL**	NP-DNGA150408GAWS2JL	.031						★							
	✶1 NP-DNGA**431-GSWS2JR**	NP-DNGA150404GSWS2JR	.016	★												
	✶1 NP-DNGA**431-GSWS2JL**	NP-DNGA150404GSWS2JL	.016	★												
	✶1 NP-DNGA**432-GSWS2JR**	NP-DNGA150408GSWS2JR	.031	★												
	✶1 NP-DNGA**432-GSWS2JL**	NP-DNGA150408GSWS2JL	.031	★												
NEW PETIT CUT (NEW)  (With breaker)	**BF-DNGA431-TS2**	BF-DNGA150404TS2	.016				★									C010 −012 E021 E024 H009 −011
	BF-DNGA**432-TS2**	BF-DNGA150408TS2	.031				★									
	BF-DNGA**433-TS2**	BF-DNGA150412TS2	.047				★									

✶1 Please refer to page B014 before using the wiper insert.

■ = MIRACLE SIGMA

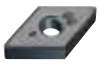
IDENTIFICATION ➤ B002
HONING ➤ B011

55° DN TYPE INSERTS WITH HOLE

BF-DNGM 4 3 1 TA2
Size Thickness Corner Radius Honing & Wiper
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN				CBN							Solid CBN	Applicable Holder Page
				MBC010	MBC020	BC8020	BC8110 (NEW)	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	MBS140	
NEW PETIT CUT  (With breaker)	**BF-DNGM431-TA2**	BF-DNGM150404TA2	.016	●												C010 −012 E021 E024 H009 −011
	BF-DNGM**432-TA2**	BF-DNGM150408TA2	.031	●												
	BF-DNGM**433-TA2**	BF-DNGM150412TA2	.047	●												
	NEW BF-DNGM**431-TS2**	BF-DNGM150404TS2	.016				●									
	NEW BF-DNGM**432-TS2**	BF-DNGM150408TS2	.031				●									
	NEW BF-DNGM**433-TS2**	BF-DNGM150412TS2	.047				●									
NEW PETIT CUT  (With breaker)	**BM-DNGM432-TA2**	BM-DNGM150408TA2	.031			★										C010 −012 E021 E024 H009 −011
	BM-DNGM**433-TA2**	BM-DNGM150412TA2	.047			★										

■ = MIRACLE SIGMA

● : Inventory maintained. ★ : Inventory maintained in Japan.
<1 insert in one case>

90° SN TYPE INSERTS WITH HOLE

NP-SNGA 4 3 1 GA4
Size Thickness Corner Radius Honing & Wiper
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN				CBN							Solid CBN	Applicable Holder Page
				MBC010	MBC020	BC8020	BC8110 (NEW)	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	MBS140	
NEW PETIT CUT 	**NP-SNGA431-GA4**	NP-SNGA120404GA4	.016		★											C014 –017 E022 E025
	NP-SNGA**433-GA4**	NP-SNGA120412GA4	.047		★											
NEW PETIT CUT 	**NP-SNGA431-GA2**	NP-SNGA120404GA2	.016		●											C014 –017 E022 E025
	NP-SNGA**432-GA2**	NP-SNGA120408GA2	.031		●											
	NP-SNGA**433-GA2**	NP-SNGA120412GA2	.047		●											
	NP-SNGA**431-GS2**	NP-SNGA120404GS2	.016	●												
	NP-SNGA**432-GS2**	NP-SNGA120408GS2	.031	●								●	●			
	NP-SNGA**433-GS2**	NP-SNGA120412GS2	.047	●								●	●			
	NP-SNGA**431-FS2**	NP-SNGA120404FS2	.016											●		
	NP-SNGA**432-FS2**	NP-SNGA120408FS2	.031											●		
	NP-SNGA**433-FS2**	NP-SNGA120412FS2	.047											●		
	NP-SNGA**431-TS2**	NP-SNGA120404TS2	.016											●		
	NP-SNGA**432-TS2**	NP-SNGA120408TS2	.031											●		
	NP-SNGA**433-TS2**	NP-SNGA120412TS2	.047											●		
	**SNGA432**	SNGA120408	.031									●	●			C014 –017 E022 E025
	SNGA**433**	SNGA120412	.047									●	●			
NEW 	**SNGA432**	SNGA120408	.031												●	C014 –017 E022 E025
	SNGA**433**	SNGA120412	.047												●	

IDENTIFICATION ➤ B002
HONING ➤ B011

60° TN TYPE INSERTS WITH HOLE

NP-TNGA 3 3 1 GA6
Size Thickness Corner Radius Honing & Wiper
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
H	Hardened Materials	
K	Cast Iron	
S	Heat-resistant Alloy, Titanium Alloy	
	Sintered Alloy	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN (NEW) BC8110	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Solid CBN MBS140	Applicable Holder Page
NEW PETIT CUT	**NP-TNGA331-GA6**	NP-TNGA160404GA6	.016		●	★										C018 −023 E022 E025
	NP-TNGA**332-GA6**	NP-TNGA160408GA6	.031		●	★										
	NP-TNGA**333-GA6**	NP-TNGA160412GA6	.047		●	★										
NEW	NP-TNGA**331-GS6**	NP-TNGA160404GS6	.016				★									
NEW	NP-TNGA**332-GS6**	NP-TNGA160408GS6	.031				★									
NEW	NP-TNGA**333-GS6**	NP-TNGA160412GS6	.047				★									
	NP-TNGA**331-GN6**	NP-TNGA160404GN6	.016		★											
	NP-TNGA**332-GN6**	NP-TNGA160408GN6	.031		★											
	NP-TNGA**333-GN6**	NP-TNGA160412GN6	.047		★											
	NP-TNGA**331-FS6**	NP-TNGA160404FS6	.016			★	★									
	NP-TNGA**332-FS6**	NP-TNGA160408FS6	.031			★	★									
	NP-TNGA**333-FS6**	NP-TNGA160412FS6	.047			★	★									
	NP-TNGA**331-TA6**	NP-TNGA160404TA6	.016		★	★										
	NP-TNGA**332-TA6**	NP-TNGA160408TA6	.031		★	★										
	NP-TNGA**333-TA6**	NP-TNGA160412TA6	.047		★	★										
NEW	NP-TNGA**331-TS6**	NP-TNGA160404TS6	.016				★									
NEW	NP-TNGA**332-TS6**	NP-TNGA160408TS6	.031				★									
NEW	NP-TNGA**333-TS6**	NP-TNGA160412TS6	.047				★									
NEW PETIT CUT	**NP-TNGA330.5-GA3**	NP-TNGA160402GA3	.008		●											C018 −023 E022 E025
	NP-TNGA**331-GA3**	NP-TNGA160404GA3	.016		●	●			●							
	NP-TNGA**332-GA3**	NP-TNGA160408GA3	.031		●	●			●							
	NP-TNGA**333-GA3**	NP-TNGA160412GA3	.047		●	●			●							
NEW	NP-TNGA**330.5-GS3**	NP-TNGA160402GS3	.008				○									
	NP-TNGA**331-GS3**	NP-TNGA160404GS3	.016	●			●					●	●			
	NP-TNGA**332-GS3**	NP-TNGA160408GS3	.031	●			●					●	●			
	NP-TNGA**333-GS3**	NP-TNGA160412GS3	.047	●			●					●	●			
	NP-TNGA**330.5-GN3**	NP-TNGA160402GN3	.008		●											
	NP-TNGA**331-GN3**	NP-TNGA160404GN3	.016		●											
	NP-TNGA**332-GN3**	NP-TNGA160408GN3	.031		●											
	NP-TNGA**333-GN3**	NP-TNGA160412GN3	.047		●											
NEW	NP-TNGA**330.5-FS3**	NP-TNGA160402FS3	.008				○									
	NP-TNGA**331-FS3**	NP-TNGA160404FS3	.016			★	●							●		
	NP-TNGA**332-FS3**	NP-TNGA160408FS3	.031			★	●							●		
	NP-TNGA**333-FS3**	NP-TNGA160412FS3	.047			★	●							●		
	NP-TNGA**331-TA3**	NP-TNGA160404TA3	.016		●	★					○					
	NP-TNGA**332-TA3**	NP-TNGA160408TA3	.031		●	★			●		●					
	NP-TNGA**333-TA3**	NP-TNGA160412TA3	.047		●	★			●		●					
	NP-TNGA**331-TS3**	NP-TNGA160404TS3	.016				★							●		
	NP-TNGA**332-TS3**	NP-TNGA160408TS3	.031				★							●		
	NP-TNGA**333-TS3**	NP-TNGA160412TS3	.047				★							●		

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● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan.
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Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN BC8110 (NEW)	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Solid CBN MBS140	Applicable Holder Page
NEW PETIT CUT 	**NP-TNGA332-G3**	NP-TNGA160408G3	.031						★							C018 −023 E022 E025
	NP-TNGA**333-G3**	NP-TNGA160412G3	.047						★							
	NP-TNGA**332-T3**	NP-TNGA160408T3	.031						★							
	NP-TNGA**333-T3**	NP-TNGA160412T3	.047						★							
NEW PETIT CUT (With Wiper) 	**NP-TNGA333-GSWS3JR**	NP-TNGA160412GSWS3JR	.047		○											C018 −023 E022 E025
	NP-TNGA**333-GSWS3JL**	NP-TNGA160412GSWS3JL	.047		○											
NEW PETIT CUT  (With breaker)	**BM-TNGM332-TA3**	BM-TNGM160408TA3	.031			★										C018 −023 E022 E025
	BM-TNGM**333-TA3**	BM-TNGM160412TA3	.047			★										
	**TNGA331**	TNGA160404	.016					★				●	●			C018 −023 E022 E025
	TNGA**332**	TNGA160408	.031					★				●	●			
	TNGA**431**	TNGA220404	.016									●				
	TNGA**432**	TNGA220408	.031									●				
	TNGA**433**	TNGA220412	.047									●				
NEW 	**TNGA332**	TNGA160408	.031												●	C018 −023 E022 E025
	TNGA**333**	TNGA160412	.047												●	

IDENTIFICATION ➤ B002
HONING ➤ B011

35° VN TYPE INSERTS WITH HOLE

NP-VNGA 3 3 1 GA4
Size Thickness Corner Radius Honing & Wiper
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
H	Hardened Materials	
K	Cast Iron	
S	Heat-resistant Alloy, Titanium Alloy	
	Sintered Alloy	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN BC8110 (NEW)	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Solid CBN MBS140	Applicable Holder Page
NEW PETIT CUT	**NP-VNGA331-GA4**	NP-VNGA160404GA4	.016		●	★										
	NP-VNGA**332-GA4**	NP-VNGA160408GA4	.031		●	★										
	NP-VNGA**333-GA4**	NP-VNGA160412GA4	.047			★										
NEW	NP-VNGA**331-GS4**	NP-VNGA160404GS4	.016				★									
NEW	NP-VNGA**332-GS4**	NP-VNGA160408GS4	.031				★									
NEW	NP-VNGA**333-GS4**	NP-VNGA160412GS4	.047				★									
	NP-VNGA**331-FS4**	NP-VNGA160404FS4	.016			★	★									C024 C025 E023 E026
	NP-VNGA**332-FS4**	NP-VNGA160408FS4	.031			★	★									
	NP-VNGA**333-FS4**	NP-VNGA160412FS4	.047			★										
	NP-VNGA**331-TA4**	NP-VNGA160404TA4	.016			★										
	NP-VNGA**332-TA4**	NP-VNGA160408TA4	.031			★										
	NP-VNGA**333-TA4**	NP-VNGA160412TA4	.047			★										
NEW	NP-VNGA**331-TS4**	NP-VNGA160404TS4	.016				★									
NEW	NP-VNGA**332-TS4**	NP-VNGA160408TS4	.031				★									
NEW PETIT CUT	**NP-VNGA330.5-GA2**	NP-VNGA160402GA2	.008		●				●							
	NP-VNGA**331-GA2**	NP-VNGA160404GA2	.016		●	●			●		●					
	NP-VNGA**332-GA2**	NP-VNGA160408GA2	.031		●	●			●		●					
NEW	NP-VNGA**330.5-GS2**	NP-VNGA160402GS2	.008				○									
	NP-VNGA**331-GS2**	NP-VNGA160404GS2	.016				●					○	○	●		
	NP-VNGA**332-GS2**	NP-VNGA160408GS2	.031				●					○	○	●		
NEW	NP-VNGA**333-GS2**	NP-VNGA160412GS2	.047				●									C024 C025 E023 E026
	NP-VNGA**330.5-GN2**	NP-VNGA160402GN2	.008		●											
NEW	NP-VNGA**330.5-FS2**	NP-VNGA160402FS2	.008				○									
	NP-VNGA**331-FS2**	NP-VNGA160404FS2	.016			★	●							●		
	NP-VNGA**332-FS2**	NP-VNGA160408FS2	.031			★	●							●		
	NP-VNGA**331-TA2**	NP-VNGA160404TA2	.016			★			●		●					
	NP-VNGA**332-TA2**	NP-VNGA160408TA2	.031			★			●		●					
	NP-VNGA**331-TS2**	NP-VNGA160404TS2	.016				★							●		
	NP-VNGA**332-TS2**	NP-VNGA160408TS2	.031				★							●		
NEW PETIT CUT	**NP-VNMA331T**	NP-VNMA160404T	.016							★						
	NP-VNMA**332T**	NP-VNMA160408T	.031							★						C024 C025 E023 E026

■ = MIRACLE SIGMA

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan.
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material			Coated CBN				CBN							Solid CBN	
	H	Hardened Materials	●	◐	◐	●	●	◐	◐	✠	● ◐ ◐		◐	✠	
	K	Cast Iron													
	S	Heat-resistant Alloy, Titanium Alloy													
		Sintered Alloy													

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	MBC010	MBC020	BC8020	BC8110 (NEW)	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	MBS140	Applicable Holder Page
	**VNGA332**	VNGA160408	0.31						●							C024 C025 E023 E026

80° WN TYPE INSERTS WITH HOLE

NP-WNGA 4 3 2 GA6
Size Thickness Corner Radius Honing & Wiper
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◔ General Cutting ✠ Unstable Cutting

Work Material		
H	Hardened Materials	
K	Cast Iron	
S	Heat-resistant Alloy, Titanium Alloy	
	Sintered Alloy	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN BC8110 (NEW)	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Solid CBN MBS140	Applicable Holder Page
NEW PETIT CUT 	**NP-WNGA432-GA6**	NP-WNGA080408GA6	.031		★											
	NEW NP-WNGA**432-GS6**	NP-WNGA080408GS6	.031				★									C027 E023 E026 E027
	NEW NP-WNGA**432-FS6**	NP-WNGA080408FS6	.031				★									
	NEW NP-WNGA**432-TS6**	NP-WNGA080408TS6	.031				★									
NEW PETIT CUT 	**NP-WNGA432-GA3**	NP-WNGA080408GA3	.031		●	●										
	NEW NP-WNGA**432-GS3**	NP-WNGA080408GS3	.031				★									C027 E023 E026 E027
	NP-WNGA**432-FS3**	NP-WNGA080408FS3	.031				★							●		
	NP-WNGA**432-TS3**	NP-WNGA080408TS3	.031				★							●		
NEW PETIT CUT (With Wiper) 	★1 **NP-WNGA432-GAWS3**	NP-WNGA080408GAWS3	.031		●				★							
	★1 NP-WNGA**432-GSWS3**	NP-WNGA080408GSWS3	.031	★			★									C027 E023 E026 E027

★1 Please refer to page B014 before using the wiper insert.

■ = MIRACLE SIGMA

● : Inventory maintained. ★ : Inventory maintained in Japan.
<1 insert in one case>

80° CN TYPE INSERTS WITHOUT HOLE

CNG 4 3 1
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN BC8110 (NEW)	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Solid CBN MBS140	Applicable Holder Page
	**CNG431**	CNGN120404	.016												★	–
	CNG**432**	CNGN120408	.031												●	
	CNG**433**	CNGN120412	.047												●	

55° DN TYPE INSERTS WITHOUT HOLE

DNG 3 2 2
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN BC8110 (NEW)	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Solid CBN MBS140	Applicable Holder Page
	**DNG322**	DNGN110308	.031												★	–
	DNG**323**	DNGN110312	.047												★	

RN TYPE INSERTS WITHOUT HOLE

RNG 3 2
Size Thickness
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN				CBN							Solid CBN	Applicable Holder Page
				MBC010	MBC020	BC8020	BC8110 (NEW)	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	MBS140	
	**RNG32**	RNGN090300	0												●	–
	RNG**42**	RNGN120300	0												●	
	RNG**43**	RNGN120400	0												●	

90° SN TYPE INSERTS WITHOUT HOLE

SNG 3 2 2
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN				CBN							Solid CBN	Applicable Holder Page
				MBC010	MBC020	BC8020	BC8110 (NEW)	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	MBS140	
	**SNG322**	SNGN090308	.031												●	–
	SNG**323**	SNGN090312	.047												●	
	SNG**324**	SNGN090316	.063												●	
	SNG**432**	SNGN120408	.031												●	
	SNG**433**	SNGN120412	.047												★	
	SNG**434**	SNGN120416	.063												●	
	**SNG432**	SNGN120408	.031									●				–
	SNG**433**	SNGN120412	.047									●				

● : Inventory maintained. ★ : Inventory maintained in Japan.
<1 insert in one case>

60° TN TYPE INSERTS WITHOUT HOLE

TNG 3 3 2
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN				CBN							Solid CBN	Applicable Holder Page
				MBC010	MBC020	BC8020	BC8110 (NEW)	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	MBS140	
	**TNG332**	TNGN160408	.031												●	–
	TNG**333**	TNGN160412	.047												●	
	TNG**334**	TNGN160416	.063												●	
	**TNG331**	TNGN160404	.016									●				–
	TNG**332**	TNGN160408	.031									●				

80° CC TYPE INSERTS WITH HOLE

NP-CCGB 2 1.5 1 GA2
Size Thickness Corner Radius Honing & Wiper
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material		
H	Hardened Materials	
K	Cast Iron	
S	Heat-resistant Alloy, Titanium Alloy	
	Sintered Alloy	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN BC8110 (NEW)	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Applicable Holder Page
NEW PETIT CUT	**NP-CCGB21.51-GA2**	NP-CCGB060204GA2	.016		★				●						C030 E006 E012 E013
NEW PETIT CUT	**NP-CCGW21.50.5-GA2**	NP-CCGW060202GA2	.008		●	●			●						C030 D008 D012 E012 E013
	NP-CCGW**21.51-GA2**	NP-CCGW060204GA2	.016		●	●			●						
	NP-CCGW**21.52-GA2**	NP-CCGW060208GA2	.031		●	●			●						
	NP-CCGW**32.50.5-GA2**	NP-CCGW09T302GA2	.008		●	●			●						
	NP-CCGW**32.51-GA2**	NP-CCGW09T304GA2	.016		●	●			●						
	NP-CCGW**32.52-GA2**	NP-CCGW09T308GA2	.031		●	●			●						
	NP-CCGW**21.50.5-GS2**	NP-CCGW060202GS2	.008				●					●	●		
	NP-CCGW**21.51-GS2**	NP-CCGW060204GS2	.016	●			●					●	●		
	NP-CCGW**21.52-GS2**	NP-CCGW060208GS2	.031				●					●	●		
	NP-CCGW**32.50.5-GS2**	NP-CCGW09T302GS2	.008				●					●	●		
	NP-CCGW**32.51-GS2**	NP-CCGW09T304GS2	.016	●			●					●	●		
	NP-CCGW**32.52-GS2**	NP-CCGW09T308GS2	.031	●			●					●	●		
	NP-CCGW**32.50.5-GN2**	NP-CCGW09T302GN2	.008		●										
	NP-CCGW**32.51-GN2**	NP-CCGW09T304GN2	.016		●										
	NP-CCGW**32.52-GN2**	NP-CCGW09T308GN2	.031		●										
	NP-CCGW**21.50.5-FA2**	NP-CCGW060202FA2	.008									●	●		
	NP-CCGW**21.51-FA2**	NP-CCGW060204FA2	.016									●	●		
	NP-CCGW**21.52-FA2**	NP-CCGW060208FA2	.031									●	●		
	NP-CCGW**32.51-FA2**	NP-CCGW09T304FA2	.016									●	●		
	NP-CCGW**32.52-FA2**	NP-CCGW09T308FA2	.031									●	●		
	NP-CCGW**21.50.5-FS2**	NP-CCGW060202FS2	.008			★	●							●	
	NP-CCGW**21.51-FS2**	NP-CCGW060204FS2	.016			★	●							●	
	NP-CCGW**21.52-FS2**	NP-CCGW060208FS2	.031				●							●	
	NP-CCGW**32.50.5-FS2**	NP-CCGW09T302FS2	.008			★	●							●	
	NP-CCGW**32.51-FS2**	NP-CCGW09T304FS2	.016			★	●							●	
	NP-CCGW**32.52-FS2**	NP-CCGW09T308FS2	.031			★	●							●	
	NP-CCGW**21.50.5-TA2**	NP-CCGW060202TA2	.008								●				
	NP-CCGW**21.51-TA2**	NP-CCGW060204TA2	.016								●				
	NP-CCGW**21.52-TA2**	NP-CCGW060208TA2	.031								●				
	NP-CCGW**32.50.5-TA2**	NP-CCGW09T302TA2	.008								●				
	NP-CCGW**32.51-TA2**	NP-CCGW09T304TA2	.016								●				
	NP-CCGW**32.52-TA2**	NP-CCGW09T308TA2	.031								●				

■ = MIRACLE SIGMA

● : Inventory maintained. ★ : Inventory maintained in Japan.
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN BC8110 (NEW)	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Applicable Holder Page
NEW PETIT CUT	**NP-CCGW21.50.5-TS2**	NP-CCGW060202TS2	.008											●	C030 D008 D012 E012 E013
	NP-CCGW**21.51-TS2**	NP-CCGW060204TS2	.016											●	
	NP-CCGW**21.52-TS2**	NP-CCGW060208TS2	.031											●	
	NP-CCGW**32.50.5-TS2**	NP-CCGW09T302TS2	.008											●	
	NP-CCGW**32.51-TS2**	NP-CCGW09T304TS2	.016											●	
	NP-CCGW**32.52-TS2**	NP-CCGW09T308TS2	.031											●	
NEW PETIT CUT (With Wiper)	✶1 **NP-CCGW32.51-GAWS2**	NP-CCGW09T304GAWS2	.016						●						C030 D008 D012 E012 E013
	✶1 NP-CCGW**32.52-GAWS2**	NP-CCGW09T308GAWS2	.031		●				★						
NEW	✶1 NP-CCGW**32.51-GSWS2**	NP-CCGW09T304GSWS2	.016				●								
	✶1 NP-CCGW**32.52-GSWS2**	NP-CCGW09T308GSWS2	.031	●			●								
NEW PETIT CUT	**BF-CCGT32.51-TA2**	BF-CCGT09T304TA2	.016		●										C030 D008 D012 E012 E013
	BF-CCGT**32.52-TA2**	BF-CCGT09T308TA2	.031		●										
NEW	BF-CCGT**32.51-TS2**	BF-CCGT09T304TS2	.016				●								
NEW	BF-CCGT**32.52-TS2**	BF-CCGT09T308TS2	.031				●								
NEW PETIT CUT NEW (With breaker)	**BF-CCGW32.51-TS2**	BF-CCGW09T304TS2	.016				★								C030 D008 D012 E012 E013
	BF-CCGW**32.52-TS2**	BF-CCGW09T308TS2	.031				★								
NEW PETIT CUT	**NP-CCGW1.20.90.5FA**	NP-CCGW03S102FA	.008						●						E029
	NP-CCGW**1.51.10.5FA**	NP-CCGW04T002FA	.008						●						
NEW	NP-CCGW**1.20.90.5FS**	NP-CCGW03S102FS	.008				●								
	NP-CCGW**1.20.91FS**	NP-CCGW03S104FS	.016				●		●						
NEW	NP-CCGW**1.51.10.5FS**	NP-CCGW04T002FS	.008				●								
	NP-CCGW**1.51.11FS**	NP-CCGW04T004FS	.016				●		●						
NEW	**CCGW21.50.5FS**	CCGW060202FS	.008											★	C030 D008 D012 E012 E013
	CCGW**21.51FS**	CCGW060204FS	.016											★	
	CCGW**21.52FS**	CCGW060208FS	.031											★	
	CCGW**32.51FS**	CCGW09T304FS	.016											★	
	CCGW**32.52FS**	CCGW09T308FS	.031											★	
	CCGW32.51	CCGW09T304	.016						●						C030 D008 D012 E012 E013
	CCGW**32.52**	CCGW09T308	.031						●						
	CCGW**432**	CCGW120408	.031						●						

✶1 Please refer to page B014 before using the wiper insert.

■ = MIRACLE SIGMA

IDENTIFICATION ➤ B002
HONING ➤ B011

80° CP TYPE INSERTS WITH HOLE

NP-CPGB 2.5 1.5 1 GA2
Size Thickness Corner Radius Honing & Wiper
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN BC8110 (NEW)	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Applicable Holder Page
NEW PETIT CUT	**NP-CPGB2.51.51-GA2**	NP-CPGB080204GA2	.016		★	★									
	NP-CPGB**2.51.52-GA2**	NP-CPGB080208GA2	.031		★	★									
	NP-CPGB**321-GA2**	NP-CPGB090304GA2	.016		★				●						
	NP-CPGB**322-GA2**	NP-CPGB090308GA2	.031		★										
	NEW NP-CPGB**2.51.51-GS2**	NP-CPGB080204GS2	.016				★								
	NEW NP-CPGB**2.51.52-GS2**	NP-CPGB080208GS2	.031				★								
	NEW NP-CPGB**320.5-GS2**	NP-CPGB090302GS2	.008				○								
	NEW NP-CPGB**321-GS2**	NP-CPGB090304GS2	.016				★								E006
	NEW NP-CPGB**322-GS2**	NP-CPGB090308GS2	.031				★								
	NP-CPGB**2.51.50.5-FS2**	NP-CPGB080202FS2	.008											★	
	NP-CPGB**2.51.51-FS2**	NP-CPGB080204FS2	.016			★	★							★	
	NP-CPGB**2.51.52-FS2**	NP-CPGB080208FS2	.031			★	★								
	NP-CPGB**320.5-FS2**	NP-CPGB090302FS2	.008				○							●	
	NP-CPGB**321-FS2**	NP-CPGB090304FS2	.016											●	
	NP-CPGB**322-FS2**	NP-CPGB090308FS2	.031											●	

■ = MIRACLE SIGMA

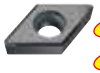
● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan.
<1 insert in one case>

55° DC TYPE INSERTS WITH HOLE

NP-DCGW 2 1.5 0.5 GA2
Size Thickness Corner Radius Honing & Wiper
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN BC8110 (NEW)	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Applicable Holder Page
NEW PETIT CUT	**NP-DCGW21.50.5-GA2**	NP-DCGW070202GA2	.008		●	★			●						
	NP-DCGW**21.51-GA2**	NP-DCGW070204GA2	.016		●	●			●						
	NP-DCGW**21.52-GA2**	NP-DCGW070208GA2	.031		●	●			●						
	NP-DCGW**32.50.5-GA2**	NP-DCGW11T302GA2	.008		●	★			●						
	NP-DCGW**32.51-GA2**	NP-DCGW11T304GA2	.016		●	●			●						
	NP-DCGW**32.52-GA2**	NP-DCGW11T308GA2	.031		●	●			●						
NEW	NP-DCGW**21.50.5-GS2**	NP-DCGW070202GS2	.008				●								
	NP-DCGW**21.51-GS2**	NP-DCGW070204GS2	.016	●			●								
NEW	NP-DCGW**21.52-GS2**	NP-DCGW070208GS2	.031				●								
	NP-DCGW**32.50.5-GS2**	NP-DCGW11T302GS2	.008	★			●						●		
	NP-DCGW**32.51-GS2**	NP-DCGW11T304GS2	.016	●			●		●			●	●		
	NP-DCGW**32.52-GS2**	NP-DCGW11T308GS2	.031	●			●		●			●	●		
	NP-DCGW**21.50.5-GN2**	NP-DCGW070202GN2	.008		●										
	NP-DCGW**21.51-GN2**	NP-DCGW070204GN2	.016		●										
	NP-DCGW**21.52-GN2**	NP-DCGW070208GN2	.031		●										
	NP-DCGW**32.50.5-GN2**	NP-DCGW11T302GN2	.008		●										
	NP-DCGW**32.51-GN2**	NP-DCGW11T304GN2	.016		●										
	NP-DCGW**32.52-GN2**	NP-DCGW11T308GN2	.031		●										
	NP-DCGW**32.51-FA2**	NP-DCGW11T304FA2	.016									●	●		
	NP-DCGW**32.52-FA2**	NP-DCGW11T308FA2	.031									●	●		
	NP-DCGW**21.50.5-FS2**	NP-DCGW070202FS2	.008			★	●								
	NP-DCGW**21.51-FS2**	NP-DCGW070204FS2	.016			★	●							●	
	NP-DCGW**21.52-FS2**	NP-DCGW070208FS2	.031				●							●	
	NP-DCGW**32.50.5-FS2**	NP-DCGW11T302FS2	.008			★	●							●	
	NP-DCGW**32.51-FS2**	NP-DCGW11T304FS2	.016			★	●							●	
	NP-DCGW**32.52-FS2**	NP-DCGW11T308FS2	.031			★	●							●	
	NP-DCGW**21.50.5-TA2**	NP-DCGW070202TA2	.008								●				
	NP-DCGW**21.51-TA2**	NP-DCGW070204TA2	.016								●				
	NP-DCGW**32.50.5-TA2**	NP-DCGW11T302TA2	.008								●				
	NP-DCGW**32.51-TA2**	NP-DCGW11T304TA2	.016								●				
	NP-DCGW**32.52-TA2**	NP-DCGW11T308TA2	.031								●				
	NP-DCGW**21.51-TS2**	NP-DCGW070204TS2	.016											●	
	NP-DCGW**21.52-TS2**	NP-DCGW070208TS2	.031											●	
	NP-DCGW**32.50.5-TS2**	NP-DCGW11T302TS2	.008											●	
	NP-DCGW**32.51-TS2**	NP-DCGW11T304TS2	.016											●	
	NP-DCGW**32.52-TS2**	NP-DCGW11T308TS2	.031											●	
NEW PETIT CUT	**BF-DCGT32.51-TA2**	BF-DCGT11T304TA2	.016		●										C031 C032 D009 D013 D040 E008 E013 E014
	BF-DCGT**32.52-TA2**	BF-DCGT11T308TA2	.031		●										
	NEW BF-DCGT**32.51-TS2**	BF-DCGT11T304TS2	.016				★								
	NEW BF-DCGT**32.52-TS2**	BF-DCGT11T308TS2	.031				★								
(With breaker)															

■ = MIRACLE SIGMA

IDENTIFICATION ➤ B002
HONING ➤ B011

55° DC TYPE INSERTS WITH HOLE

BF-DCGW 3 2.5 1 TS2
Size Thickness Corner Radius Honing & Wiper
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN BC8110 (NEW)	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Applicable Holder Page
NEW PETIT CUT	**BF-DCGW32.51-TS2**	BF-DCGW11T304TS2	.016				★								D009 D013 D040 E013 E014
NEW (With breaker)	BF-DCGW**32.52-TS2**	BF-DCGW11T308TS2	.031				★								
NEW PETIT CUT	**NP-DCMW21.51G**	NP-DCMW070204G	.016							▲					C031 C032 D009 D013 D040 E008 E013 E014
	NP-DCMW**32.51G**	NP-DCMW11T304G	.016							▲					
NEW	**DCGW21.51FS**	DCGW070204FS	.016											★	C031 C032 D009 D013 D040 E008 E013 E014
	DCGW**21.52FS**	DCGW070208FS	.031											★	
	DCGW32.51	DCGW11T304	.016						●						C031 C032 D009 D013 D040 E008 E013 E014

■ = MIRACLE SIGMA

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<1 insert in one case>

60° TC TYPE INSERTS WITH HOLE

NP-TCGW 1.8 1.5 0.5 GA3
Size Thickness Corner Radius Honing & Wiper
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN BC8110 (NEW)	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Applicable Holder Page
NEW PETIT CUT	**NP-TCGW1.81.50.5-GA3**	NP-TCGW090202GA3	.008		●										
	NP-TCGW**1.81.51-GA3**	NP-TCGW090204GA3	.016		●										
	NP-TCGW**1.81.52-GA3**	NP-TCGW090208GA3	.031		●										
	NP-TCGW**21.50.5-GA3**	NP-TCGW110202GA3	.008		●										
	NP-TCGW**21.51-GA3**	NP-TCGW110204GA3	.016		●	●									
	NP-TCGW**21.52-GA3**	NP-TCGW110208GA3	.031		●	●									
	NP-TCGW**2.521-GA3**	NP-TCGW130304GA3	.016		★										
	NP-TCGW**2.522-GA3**	NP-TCGW130308GA3	.031		★										
	NP-TCGW**32.51-GA3**	NP-TCGW16T304GA3	.016		●	●									
	NP-TCGW**32.52-GA3**	NP-TCGW16T308GA3	.031		●										
	NEW NP-TCGW**1.81.51-GS3**	NP-TCGW090204GS3	.016				★								
	NEW NP-TCGW**1.81.52-GS3**	NP-TCGW090208GS3	.031				★								
	NEW NP-TCGW**21.50.5-GS3**	NP-TCGW110202GS3	.008				●								
	NEW NP-TCGW**21.51-GS3**	NP-TCGW110204GS3	.016				●								C035 E015 E016
	NEW NP-TCGW**21.52-GS3**	NP-TCGW110208GS3	.031				●								
	NEW NP-TCGW**2.521-GS3**	NP-TCGW130304GS3	.016				★								
	NEW NP-TCGW**2.522-GS3**	NP-TCGW130308GS3	.031				★								
	NEW NP-TCGW**32.51-GS3**	NP-TCGW16T304GS3	.016				●								
	NEW NP-TCGW**32.52-GS3**	NP-TCGW16T308GS3	.031				●								
	NP-TCGW**21.51-FA3**	NP-TCGW110204FA3	.016									●	●		
	NP-TCGW**21.52-FA3**	NP-TCGW110208FA3	.031									●	●		
	NP-TCGW**21.51-FS3**	NP-TCGW110204FS3	.016											●	
	NP-TCGW**21.52-FS3**	NP-TCGW110208FS3	.031											●	
	NP-TCGW**32.51-FS3**	NP-TCGW16T304FS3	.016											●	
	NP-TCGW**32.52-FS3**	NP-TCGW16T308FS3	.031											●	
	NP-TCGW**21.51-TS3**	NP-TCGW110204TS3	.016											●	
	NP-TCGW**21.52-TS3**	NP-TCGW110208TS3	.031											●	
	TCGW1.81.51FS	TCGW090204FS	.016											★	
	TCGW**1.81.52FS**	TCGW090208FS	.031											★	C035 E015 E016
	TCGW**21.51FS**	TCGW110204FS	.016											★	
	TCGW**21.52FS**	TCGW110208FS	.031											★	

■ = MIRACLE SIGMA

IDENTIFICATION ➤ B002
HONING ➤ B011

60° TP TYPE INSERTS WITH HOLE

NP-TPGB 1.5 1.5 1 GA3
Size Thickness Corner Radius Honing & Wiper
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN BC8110 (NEW)	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	MB710	MB730	MB4020	Applicable Holder Page
NEW PETIT CUT	**NP-TPGB1.51.51-GA3**	NP-TPGB080204GA3	.016		●				●						
	NP-TPGB**1.51.52-GA3**	NP-TPGB080208GA3	.031		●										
	NP-TPGB**1.81.51-GA3**	NP-TPGB090204GA3	.016		●				●						
	NP-TPGB**1.81.52-GA3**	NP-TPGB090208GA3	.031		●										
	NP-TPGB**221-GA3**	NP-TPGB110304GA3	.016		★	★									
	NP-TPGB**222-GA3**	NP-TPGB110308GA3	.031		★	★									
	NP-TPGB**321-GA3**	NP-TPGB160304GA3	.016		★	★			●						
	NP-TPGB**322-GA3**	NP-TPGB160308GA3	.031		★	●									
	NEW NP-TPGB**1.51.51-GS3**	NP-TPGB080204GS3	.016				★								
	NEW NP-TPGB**1.51.52-GS3**	NP-TPGB080208GS3	.031				★								
	NEW NP-TPGB**1.81.51-GS3**	NP-TPGB090204GS3	.016				★								
	NEW NP-TPGB**1.81.52-GS3**	NP-TPGB090208GS3	.031				★								
	NEW NP-TPGB**220.5-GS3**	NP-TPGB110302GS3	.008				○								
	NEW NP-TPGB**221-GS3**	NP-TPGB110304GS3	.016				★								
	NEW NP-TPGB**222-GS3**	NP-TPGB110308GS3	.031				★								
	NEW NP-TPGB**321-GS3**	NP-TPGB160304GS3	.016				★								
	NEW NP-TPGB**322-GS3**	NP-TPGB160308GS3	.031				★								
	NP-TPGB**1.81.50.5-FS3**	NP-TPGB090202FS3	.008											●	
	NP-TPGB**1.81.51-FS3**	NP-TPGB090204FS3	.016											●	
	NP-TPGB**220.5-FS3**	NP-TPGB110302FS3	.008				○							●	
	NP-TPGB**221-FS3**	NP-TPGB110304FS3	.016			★	★							●	
	NP-TPGB**222-FS3**	NP-TPGB110308FS3	.031			★	★							●	
	NP-TPGB**321-FS3**	NP-TPGB160304FS3	.016			★									
	NP-TPGB**322-FS3**	NP-TPGB160308FS3	.031			★									
NEW PETIT CUT	NEW NP-TPGX**221-GA3**	NP-TPGX110304GA3	.016						○						
	NEW NP-TPGX**222-GA3**	NP-TPGX110308GA3	.031						○						
	NP-TPGX**1.51.50.5-GS3**	NP-TPGX080202GS3	.008	★											
	NP-TPGX**1.51.51-GS3**	NP-TPGX080204GS3	.016	★											
	NP-TPGX**1.81.50.5-GS3**	NP-TPGX090202GS3	.008	★											
	NP-TPGX**1.81.51-GS3**	NP-TPGX090204GS3	.016	★											
	NP-TPGX**221-GS3**	NP-TPGX110304GS3	.016	★											
	NP-TPGX**222-GS3**	NP-TPGX110308GS3	.031	★											
	NP-TPGX**221-TA3**	NP-TPGX110304TA3	.016								○				
	NP-TPGX**222-TA3**	NP-TPGX110308TA3	.031								●				
NEW PETIT CUT	**NP-TPGX1.51.50.5F**	NP-TPGX080202F	.008					★							
	NP-TPGX**1.51.51F**	NP-TPGX080204F	.016					★							
	NP-TPGX**1.81.50.5F**	NP-TPGX090202F	.008					★							
	NP-TPGX**1.81.51F**	NP-TPGX090204F	.016					★							

E007 (NEW PETIT CUT, NP-TPGB)
E007 (NEW PETIT CUT, NP-TPGX)
E007 (NEW PETIT CUT, NP-TPGX1.51.50.5F)

■ = MIRACLE SIGMA

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan.
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material			Coated CBN				CBN							Applicable Holder Page
	H	Hardened Materials	●	◐	◐	●	●	◐	◐	✠	●	●	◐	
	K	Cast Iron												
	S	Heat-resistant Alloy, Titanium Alloy										◐		
		Sintered Alloy											●	

Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	MBC010	MBC020	BC8020	BC8110 (NEW)	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	Applicable Holder Page
	**TPGX1.51.50.5**	TPGX080202	.008									★	★		E007
	TPGX**1.51.51**	TPGX080204	.016					★				★	★		
	TPGX**1.81.50.5**	TPGX090202	.008									★	★		
	TPGX**1.81.51**	TPGX090204	.016					★				★	★		
	TPGX**221**	TPGX110304	.016					●				●	●		
	TPGX**222**	TPGX110308	.031					●				●	●		
	TPGX**321**	TPGX160304	.016									●			
	TPGX**322**	TPGX160308	.031									●			

IDENTIFICATION ➤ B002
HONING ➤ B011

35° VB TYPE INSERTS WITH HOLE

NP-VBGW 3 3 1 GA2
Size Thickness Corner Radius Honing & Wiper
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN BC8110 (NEW)	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Applicable Holder Page
NEW PETIT CUT	**NP-VBGW331-GA2**	NP-VBGW160404GA2	.016		●	●			●						
	NP-VBGW**332-GA2**	NP-VBGW160408GA2	.031		●	●			●						
	NEW NP-VBGW**220.5-GS2**	NP-VBGW110302GS2	.008				○								
	NP-VBGW**221-GS2**	NP-VBGW110304GS2	.016				○						●		
	NP-VBGW**222-GS2**	NP-VBGW110308GS2	.031				○						●		
	NEW NP-VBGW**330.5-GS2**	NP-VBGW160402GS2	.008				○								
	NP-VBGW**331-GS2**	NP-VBGW160404GS2	.016				●					●	●		C028 C029 D010 D011 D014 D015 E009 E010 H013
	NP-VBGW**332-GS2**	NP-VBGW160408GS2	.031				●					●	●		
	NEW NP-VBGW**220.5-FS2**	NP-VBGW110302FS2	.008				○								
	NP-VBGW**221-FS2**	NP-VBGW110304FS2	.016				○							●	
	NP-VBGW**222-FS2**	NP-VBGW110308FS2	.031				○							●	
	NEW NP-VBGW**330.5-FS2**	NP-VBGW160402FS2	.008				○								
	NP-VBGW**331-FS2**	NP-VBGW160404FS2	.016			★								●	
	NP-VBGW**332-FS2**	NP-VBGW160408FS2	.031			★								●	
	NP-VBGW**221-TS2**	NP-VBGW110304TS2	.016											●	
	NP-VBGW**222-TS2**	NP-VBGW110308TS2	.031											●	
	NP-VBGW**331-TS2**	NP-VBGW160404TS2	.016											●	
	NP-VBGW**332-TS2**	NP-VBGW160408TS2	.031											●	

■ = MIRACLE SIGMA

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan.
<1 insert in one case>

35° VC TYPE INSERTS WITH HOLE

NP-VCGW 3 3 1 GA2
Size Thickness Corner Radius Honing & Wiper
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	Coated CBN BC8110 (NEW)	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Applicable Holder Page
NEW PETIT CUT	**NP-VCGW331-GA2**	NP-VCGW160404GA2	.016		●	★			●						
	NP-VCGW**332-GA2**	NP-VCGW160408GA2	.031		●	★			●						
	NEW NP-VCGW**331-GS2**	NP-VCGW160404GS2	.016				●								
	NEW NP-VCGW**332-GS2**	NP-VCGW160408GS2	.031				●								C036 E016 E017
	NP-VCGW**331-FS2**	NP-VCGW160404FS2	.016			★	●								
	NP-VCGW**332-FS2**	NP-VCGW160408FS2	.031			★	●								
	NEW NP-VCGW**331-TS2**	NP-VCGW160404TS2	.016				●								
	NEW NP-VCGW**332-TS2**	NP-VCGW160408TS2	.031				●								

■ = MIRACLE SIGMA

IDENTIFICATION ➤ B002
HONING ➤ B011

80° WC TYPE INSERTS WITH HOLE

NP-WCGW 1.5 1.5 0.5 GA3
Size Thickness Corner Radius Honing & Wiper
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✣ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

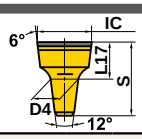
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN				CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	BC8110 (NEW)	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW PETIT CUT 	**NP-WCGW1.51.50.5-GA3**	NP-WCGWL30202GA3	.008		●				○						C037 E017 —020
	NP-WCGW**1.51.51-GA3**	NP-WCGWL30204GA3	.016		●				○						
	NP-WCGW**21.50.5-GA3**	NP-WCGW040202GA3	.008		●				○						
	NP-WCGW**21.51-GA3**	NP-WCGW040204GA3	.016		●				○						
	NP-WCGW**32.51-GA3**	NP-WCGW06T304GA3	.016		●				○						
	NP-WCGW**32.52-GA3**	NP-WCGW06T308GA3	.031		●				○						
	NP-WCGW**1.51.50.5-GS3**	NP-WCGWL30202GS3	.008	●											
	NP-WCGW**1.51.51-GS3**	NP-WCGWL30204GS3	.016	●											
	NP-WCGW**21.50.5-GS3**	NP-WCGW040202GS3	.008	●											
	NP-WCGW**21.51-GS3**	NP-WCGW040204GS3	.016	●											
	NP-WCGW**32.51-GS3**	NP-WCGW06T304GS3	.016	●											
	NP-WCGW**32.52-GS3**	NP-WCGW06T308GS3	.031	●											
NEW PETIT CUT (NEW) 	**NP-WCMW1.51.50.5-GA3**	NP-WCMWL30202GA3	.008						○						C037 E017 —020
	NP-WCMW**1.51.51-GA3**	NP-WCMWL30204GA3	.016						○						

● : Inventory maintained. ○ : Inventory maintained. (Available Summer 2015)
★ : Inventory maintained in Japan.
<1 insert in one case>

RTG TYPE INSERTS WITHOUT HOLE

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy



Shape	Order Number	(ISO) Number	CBN	Dimensions (inch)				Applicable Holder Page
			MB825	IC	L17	S	D4	
	**RTG05A**	RTG05A	★	.197	.138	.295	.098	–
	RTG**06A**	RTG06A	★	.236	.138	.295	.138	
	RTG**07A**	RTG07A	★	.276	.197	.433	.138	
	RTG**08A**	RTG08A	★	.315	.197	.433	.177	
	RTG**10A**	RTG10A	★	.394	.256	.551	.217	

IDENTIFICATION ➤ B002
HONING ➤ B011

90° SP TYPE INSERTS WITHOUT HOLE

SPG 3 2 1
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
	**SPG321**	SPGN090304	.016								●			–
	SPG**322**	SPGN090308	.031								●			
	SPG**421**	SPGN120304	.016								●	★		
	SPG**422**	SPGN120308	.031								●	★		

● : Inventory maintained. ★ : Inventory maintained in Japan.
<1 insert in one case>

60° TB TYPE INSERTS WITHOUT HOLE

TBG 1.2 1 1
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✠ Unstable Cutting

Work Material															
	H	Hardened Materials	●	◕	◕	●	◕	◕	✠	●	◕		◕		
	K	Cast Iron													
	S	Heat-resistant Alloy, Titanium Alloy													
		Sintered Alloy													

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
	**TBG1.211**	TBGN060104	.016				★				★			–
	TBG**1.212**	TBGN060108	.031				★				★			

60° TP TYPE INSERTS WITHOUT HOLE

TPG 2 2 1
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
	**TPG221**	TPGN110304	.016								●	●		–
	TPG**321**	TPGN160304	.016								●	●		
	TPG**322**	TPGN160308	.031					●			●	●		

● : Inventory maintained. ★ : Inventory maintained in Japan.
<1 insert in one case>

80° CN TYPE INSERTS WITH HOLE

NP-CNMM 4 3 0.5 RF
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●	

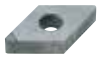
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT 	**NP-CNMM430.5RF**	NP-CNMM120402R-F	.008	★	C006 −009 E021 E024 H006 −008
	NP-CNMM**431RF**	NP-CNMM120404R-F	.016	★	
	NP-CNMM**432RF**	NP-CNMM120408R-F	.031	★	
	**CNMA431**	CNMA120404	.016	★	C006 −009 E021 E024 H006 −008
	CNMA**432**	CNMA120408	.031	★	

55° DN TYPE INSERTS WITH HOLE

NP-DNMM 4 3 0.5 RF
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT 	**NP-DNMM430.5RF**	NP-DNMM150402R-F	.008	★	C010 −012 E021 E024 H009 −011
	NP-DNMM**431RF**	NP-DNMM150404R-F	.016	★	
	NP-DNMM**432RF**	NP-DNMM150408R-F	.031	★	
	**DNGA431**	DNGA150404	.016	★	C010 −012 E021 E024 H009 −011
	DNGA**432**	DNGA150408	.031	★	

90° SN TYPE INSERTS WITH HOLE

NP-SNMM 4 3 1 RF
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT 	**NP-SNMM431RF**	NP-SNMM120404R-F	.016	★	C014 −017 E022 E025
	NP-SNMM**432RF**	NP-SNMM120408R-F	.031	★	
	**SNGA432**	SNGA120408	.031	★	C014 −017 E022 E025

60° TN TYPE INSERTS WITH HOLE

NP-TNMM 3 3 0.5 RF
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT 	**NP-TNMM330.5RF**	NP-TNMM160402R-F	.008	★	C018 −023 E022 E025
	NP-TNMM**331RF**	NP-TNMM160404R-F	.016	★	
	NP-TNMM**332RF**	NP-TNMM160408R-F	.031	★	
	**TNGA330.5**	TNGA160402	.008	★	C018 −023 E022 E025
	TNGA**331**	TNGA160404	.016	★	
	TNGA**332**	TNGA160408	.031	★	

★ : Inventory maintained in Japan.
<1 insert in one case>

35° VN TYPE INSERTS WITH HOLE

NP-VNMM 3 3 0.5 RF
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◔ General Cutting ✣ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●	

Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT 	**NP-VNMM330.5RF**	NP-VNMM160402R-F	.008	★	C024 C025 E023 E026
	NP-VNMM**331RF**	NP-VNMM160404R-F	.016	★	
	NP-VNMM**332RF**	NP-VNMM160408R-F	.031	★	
	**VNGA331**	VNGA160404	.016	★	C024 C025 E023 E026
	VNGA**332**	VNGA160408	.031	★	

90° SN TYPE INSERTS WITHOUT HOLE

SNG 4 3 1
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●	

Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	PCD MD220	Applicable Holder Page
	**SNG432**	SNGN120408	.031	★	C014 –017 E025

● : Inventory maintained. ★ : Inventory maintained in Japan.
<1 insert in one case>

80° CC TYPE INSERTS WITH HOLE

NP-CCMH 2 1.5 0.5
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non-Ferrous Metal		●	
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT 	**NP-CCMH21.50.5**	NP-CCMH060202	.008	●	C030 E006 E012 E013
	NP-CCMH**21.51**	NP-CCMH060204	.016	●	
NEW PETIT CUT 	**NP-CCMW03S102**	NP-CCMW03S102	.008	●	–
	NP-CCMW**03S104**	NP-CCMW03S104	.016	●	
	NP-CCMW**04T002**	NP-CCMW04T002	.008	●	
	NP-CCMW**04T004**	NP-CCMW04T004	.016	●	
	**CCMW21.50.5**	CCMW060202	.008	●	C030 D008 D012 E012 E013
	CCMW**21.51**	CCMW060204	.016	●	
	CCMW**32.50.5**	CCMW09T302	.008	●	
	CCMW**32.51**	CCMW09T304	.016	●	

80° CP TYPE INSERTS WITH HOLE

NP-CPMH 2.5 1.5 0.5
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

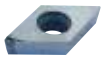
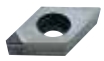
Work Material	N	Non-Ferrous Metal		●	
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT 	**NP-CPMH2.51.50.5**	NP-CPMH080202	.008	●	E006
	NP-CPMH**2.51.51**	NP-CPMH080204	.016	●	
	NP-CPMH**320.5**	NP-CPMH090302	.008	●	
	NP-CPMH**321**	NP-CPMH090304	.016	●	
	**CPGT2.51.50.5**	CPGT080202	.008	●	–
	CPGT**2.51.51**	CPGT080204	.016	●	
	CPGT**320.5**	CPGT090302	.008	●	
	CPGT**321**	CPGT090304	.016	●	

55° DC TYPE INSERTS WITH HOLE

NP-DCMT 2 1.5 0.5 RF
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT 	**NP-DCMT21.50.5RF**	NP-DCMT070202R-F	.008	●	C031 C032 D009 D013 D040 E008 E013 E014
	NP-DCMT**21.50.5LF**	NP-DCMT070202L-F	.008	●	
	NP-DCMT**21.51RF**	NP-DCMT070204R-F	.016	●	
	NP-DCMT**21.51LF**	NP-DCMT070204L-F	.016	●	
	NP-DCMT**32.50.5RF**	NP-DCMT11T302R-F	.008	●	
	NP-DCMT**32.50.5LF**	NP-DCMT11T302L-F	.008	●	
	NP-DCMT**32.51RF**	NP-DCMT11T304R-F	.016	●	
	NP-DCMT**32.51LF**	NP-DCMT11T304L-F	.016	●	
	**DCMW21.50.5**	DCMW070202	.008	★	C031 C032 D009 D013 D040 E008 E013 E014
	DCMW**21.51**	DCMW070204	.016	●	
	DCMW**32.50.5**	DCMW11T302	.008	●	
	DCMW**32.51**	DCMW11T304	.016	●	

90° SP TYPE INSERTS WITH HOLE

SPGX 3 2 1
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
	**SPGX321**	SPGX090304	.016	★	–
	SPGX**322**	SPGX090308	.031	★	

● : Inventory maintained. ★ : Inventory maintained in Japan.
<1 insert in one case>

60° TC TYPE INSERTS WITH HOLE

TCMW 2 1.5 0.5
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●	

Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	PCD MD220	Applicable Holder Page
	**TCMW21.50.5**	TCMW110202	.008	●	C035 E015 E016
	TCMW**21.51**	TCMW110204	.016	★	
	**TCGW1.210.5**	TCGW060102	.008	★	–
	TCGW**1.211**	TCGW060104	.016	★	
	TCGW**1.212**	TCGW060108	.031	★	

60° TP TYPE INSERTS WITH HOLE

NP-TPMX 1.8 1.5 0.5 RF
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●	

Shape	Order Number	(ISO)Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT 	**NP-TPMX1.81.50.5RF**	NP-TPMX090202R-F	.008	★	E007
	NP-TPMX**1.81.50.5LF**	NP-TPMX090202L-F	.008	★	
	NP-TPMX**1.81.51LF**	NP-TPMX090204L-F	.016	★	
	NP-TPMX**1.81.52LF**	NP-TPMX090208L-F	.031	★	
	NP-TPMX**220.5LF**	NP-TPMX110302L-F	.008	★	
	NP-TPMX**221LF**	NP-TPMX110304L-F	.016	★	
	NP-TPMX**222LF**	NP-TPMX110308L-F	.031	★	
	NP-TPMX**320.5LF**	NP-TPMX160302L-F	.008	★	
	NP-TPMX**321LF**	NP-TPMX160304L-F	.016	★	
	NP-TPMX**322LF**	NP-TPMX160308L-F	.031	★	
NEW PETIT CUT 	**NP-TPMH1.51.50.5RF**	NP-TPMH080202R-F	.008	●	E007
	NP-TPMH**1.51.50.5LF**	NP-TPMH080202L-F	.008	●	
	NP-TPMH**1.51.51RF**	NP-TPMH080204R-F	.016	●	
	NP-TPMH**1.51.51LF**	NP-TPMH080204L-F	.016	●	
	NP-TPMH**1.81.50.5RF**	NP-TPMH090202R-F	.008	●	
	NP-TPMH**1.81.50.5LF**	NP-TPMH090202L-F	.008	●	
	NP-TPMH**1.81.51RF**	NP-TPMH090204R-F	.016	●	
	NP-TPMH**1.81.51LF**	NP-TPMH090204L-F	.016	●	
	NP-TPMH**220.5RF**	NP-TPMH110302R-F	.008	●	
	NP-TPMH**220.5LF**	NP-TPMH110302L-F	.008	●	
	NP-TPMH**221RF**	NP-TPMH110304R-F	.016	●	
	NP-TPMH**221LF**	NP-TPMH110304L-F	.016	●	
	NP-TPMH**320.5RF**	NP-TPMH160302R-F	.008	★	
	NP-TPMH**320.5LF**	NP-TPMH160302L-F	.008	★	
	NP-TPMH**321RF**	NP-TPMH160304R-F	.016	★	
	NP-TPMH**321LF**	NP-TPMH160304L-F	.016	★	
	**TPGT320.5RF**	TPGT160302R-F	.008	★	–
	TPGT**320.5LF**	TPGT160302L-F	.008	★	
	TPGT**321RF**	TPGT160304R-F	.016	★	
	TPGT**321LF**	TPGT160304L-F	.016	★	

● : Inventory maintained. ★ : Inventory maintained in Japan.
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●	

Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	PCD MD220	Applicable Holder Page
	**TPGV1.81.50.5RF**	TPGV090202R-F	.008	★	–
	TPGV**1.81.50.5LF**	TPGV090202L-F	.008	★	
	TPGV**1.81.51RF**	TPGV090204R-F	.016	★	
	TPGV**1.81.51LF**	TPGV090204L-F	.016	★	
	TPGV**220.5RF**	TPGV110302R-F	.008	★	
	TPGV**220.5LF**	TPGV110302L-F	.008	★	
	TPGV**221RF**	TPGV110304R-F	.016	★	
	TPGV**221LF**	TPGV110304L-F	.016	★	
	**TPGX1.51.50.5**	TPGX080202	.008	★	E007
	TPGX**1.51.51**	TPGX080204	.016	★	
	TPGX**1.51.52**	TPGX080208	.031	★	
	TPGX**1.81.50.5**	TPGX090202	.008	★	
	TPGX**1.81.51**	TPGX090204	.016	★	
	TPGX**1.81.52**	TPGX090208	.031	★	
	TPGX**220.5**	TPGX110302	.008	★	
	TPGX**221**	TPGX110304	.016	★	
	TPGX**222**	TPGX110308	.031	★	
	TPGX**321**	TPGX160304	.016	★	
	TPGX**322**	TPGX160308	.031	★	

35° VB TYPE INSERTS WITH HOLE

NP-VBGT 2 2 V5 RF
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
	**NP-VBGT22V5RF**	NP-VBGT1103V5R-F	.002	★	C028 C029 D010 D011 D014 D015 E009 E010
	NP-VBGT**220.2RF**	NP-VBGT110301R-F	.004	★	
	NP-VBGT**220.5RF**	NP-VBGT110302R-F	.008	★	
	NP-VBGT**221RF**	NP-VBGT110304R-F	.016	★	

35° VC TYPE INSERTS WITH HOLE

NP-VCGT 1.5 1.5 V5 RF
Size Thickness Corner Raduis
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
	**NP-VCGT1.51.5V5RF**	NP-VCGT0802V5R-F	.002	★	C036 E009 E010 E016 E017
	NP-VCGT**1.51.50.2RF**	NP-VCGT080201R-F	.004	★	
	NP-VCGT**1.51.50.5RF**	NP-VCGT080202R-F	.008	★	
	NP-VCGT**1.51.51RF**	NP-VCGT080204R-F	.016	★	
	NP-VCGT**22V5RF**	NP-VCGT1103V5R-F	.002	★	
	NP-VCGT**220.2RF**	NP-VCGT110301R-F	.004	★	
	NP-VCGT**220.5RF**	NP-VCGT110302R-F	.008	★	
	NP-VCGT**221RF**	NP-VCGT110304R-F	.016	★	

★ : Inventory maintained in Japan.
<1 insert in one case>

80° WC TYPE INSERTS WITH HOLE

WCMW 1.5 1.5 0.5
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
	**WCMW1.51.50.5**	WCMWL30202	.008	★	E017 –020
	WCMW**21.50.5**	WCMW040202	.008	★	
	WCMW**32.51**	WCMW06T304	.016	★	

80° WP TYPE INSERTS WITH HOLE

WPGT 2 1.5 0.5
Size Thickness Corner Raduis
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●	

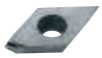
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
	**WPGT21.50.5**	WPGT040202	.008	★	–
	WPGT**21.51**	WPGT040204	.016	★	
	WPGT**320.5**	WPGT060302	.008	★	
	WPGT**321**	WPGT060304	.016	★	

55° DE TYPE INSERTS WITH HOLE

DEGX 4 3 0.5 RF
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
	**DEGX430.5RF**	DEGX150402R-F	.008	★	C041
	DEGX**430.5LF**	DEGX150402L-F	.008	★	
	DEGX**431RF**	DEGX150404R-F	.016	★	
	DEGX**431LF**	DEGX150404L-F	.016	★	

60° TE TYPE INSERTS WITH HOLE

TEGX 3 2 0.5 R
Size Thickness Corner Raduis
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
	**TEGX320.5R**	TEGX160302R	.008	★	C042 E028
	TEGX**320.5L**	TEGX160302L	.008	★	
	TEGX**321R**	TEGX160304R	.016	★	
	TEGX**321L**	TEGX160304L	.016	★	
	**TEGX320.5**	TEGX160302	.008	★	C042 E028
	TEGX**321**	TEGX160304	.016	★	

★ : Inventory maintained in Japan.
<1 insert in one case>

35° VD TYPE INSERTS WITH HOLE

VDGX 3 2 0.5 RF
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◔ General Cutting ✠ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●	

Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	PCD MD220	Applicable Holder Page
	**VDGX320.5RF**	VDGX160302R-F	.008	★	C043
	VDGX**320.5LF**	VDGX160302L-F	.008	★	
	VDGX**321RF**	VDGX160304R-F	.016	★	
	VDGX**321LF**	VDGX160304L-F	.016	★	

90° SP TYPE INSERTS WITHOUT HOLE

SPG 3 2 0.5
Size Thickness Corner Radius
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
	**SPG320.5**	SPGN090302	.008	★	–
	SPG**321**	SPGN090304	.016	★	
	SPG**322**	SPGN090308	.031	★	
	SPG**421**	SPGN120304	.016	★	
	SPG**422**	SPGN120308	.031	★	
	SPG**423**	SPGN120312	.047	★	

60° TP TYPE INSERTS WITHOUT HOLE

TPG 2 2 0.5
Size Thickness Corner Raduis
★Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non-Ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	PCD MD220	Applicable Holder Page
	**TPG220.5**	TPGN110302	.008	★	–
	TPG**221**	TPGN110304	.016	★	
	TPG**222**	TPGN110308	.031	★	
	TPG**320.5**	TPGN160302	.008	★	
	TPG**321**	TPGN160304	.016	★	
	TPG**322**	TPGN160308	.031	★	

★ : Inventory maintained in Japan.
<1 insert in one case>

IDENTIFICATION ➤ B002

Memo

GUIDE TO EXTERNAL TURNING TOOLS

●Section organization

①Organized according to turning insert shape.
(Refer to the index on the next page.)

TYPE OF TOOL HOLDER
indicates the first four letters of the order number, as well as cutting applications.

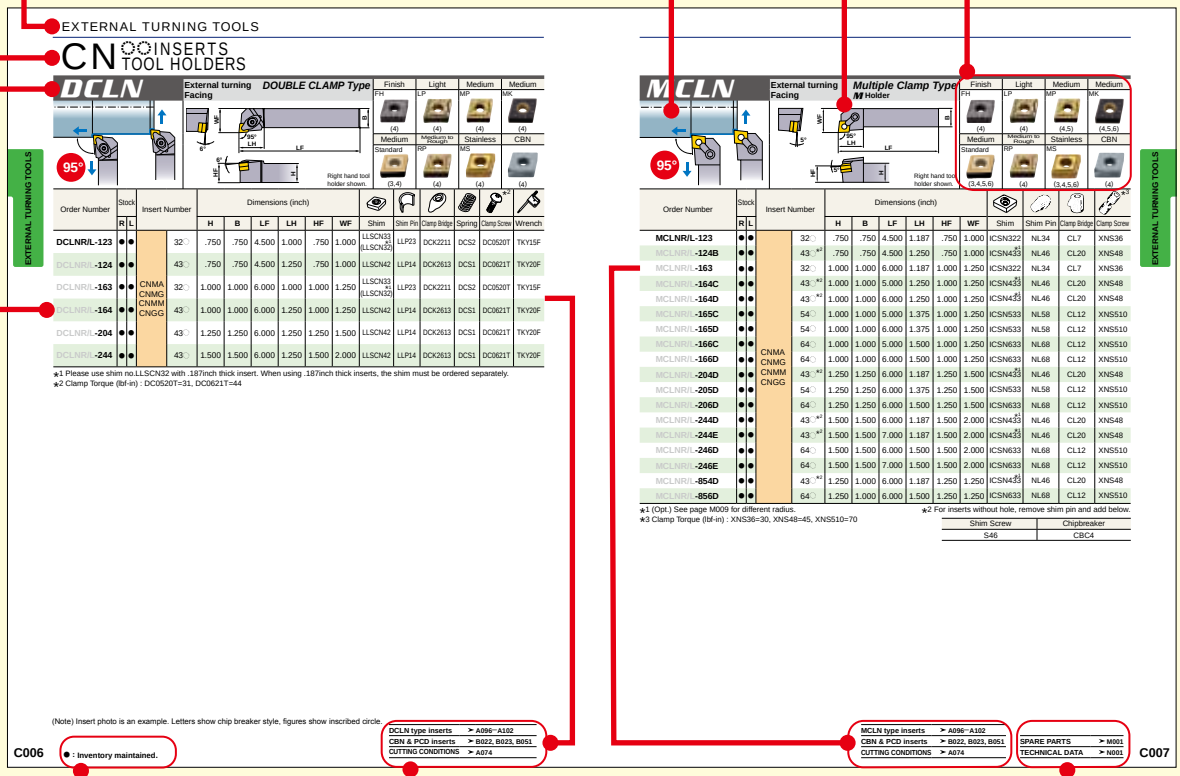
TITLE OF PRODUCT BY INSERT TYPE

PRODUCT SECTION

FIGURE SHOWING TOOLING APPLICATION
uses illustrations and arrows to depict the possible machining applications such as external turning, copying, facing, and chamfering together with cutting edge lead angles.

GEOMETRY

CHIP BREAKER BY CUTTING APPLICATION



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

REFERENCE PAGE FOR APPLICABLE INSERTS
indicates reference pages giving details of inserts that are applicable to the product.

PAGE REFERENCE
· SPARE PARTS
· TECHNICAL DATA
indicates reference pages, including the above, on the right hand page of each double-page spread.

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, and spare parts.

●To Order : Please specify order number and hand of tool (right/left).

TURNING

EXTERNAL TURNING TOOLS

CLASSIFICATION C002

IDENTIFICATION C004

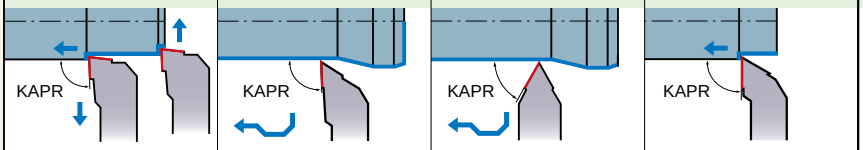
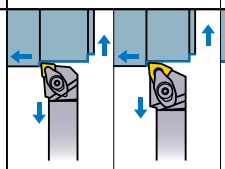
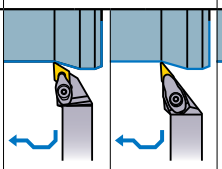
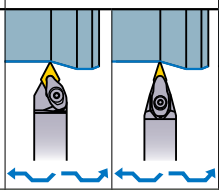
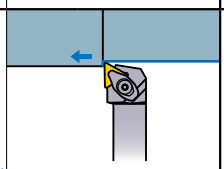
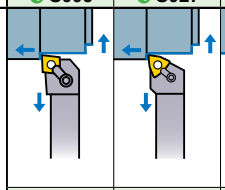
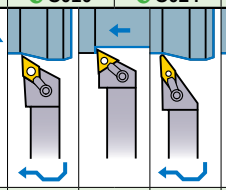
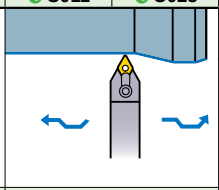
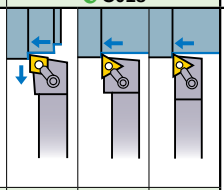
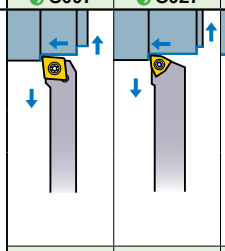
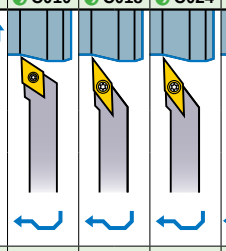
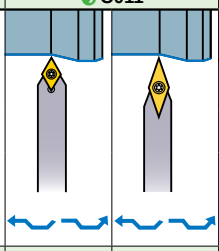
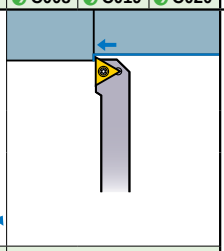
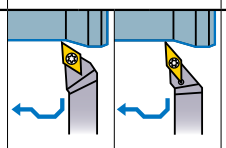
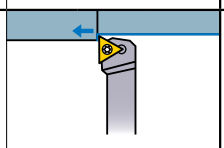
STANDARD HOLDERS

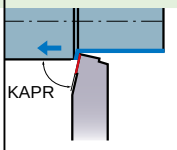
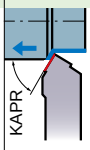
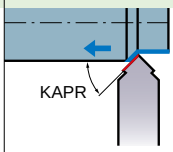
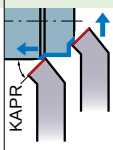
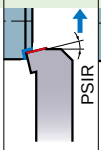
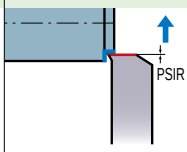
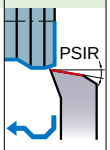
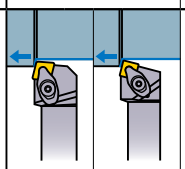
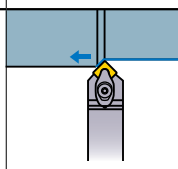
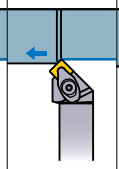
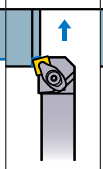
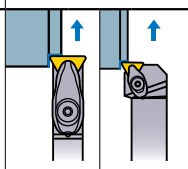
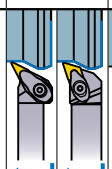
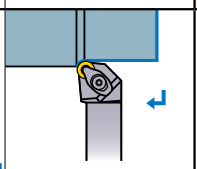
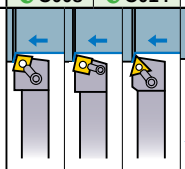
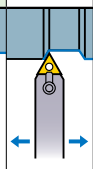
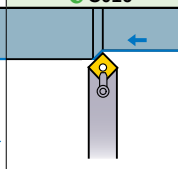
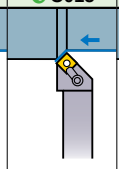
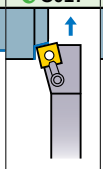
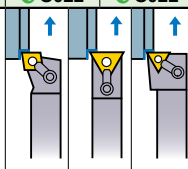
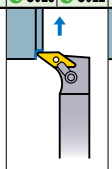
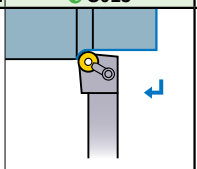
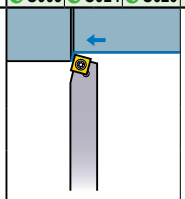
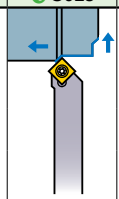
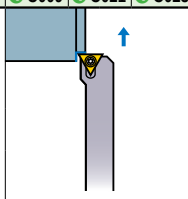
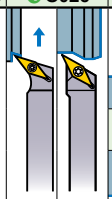
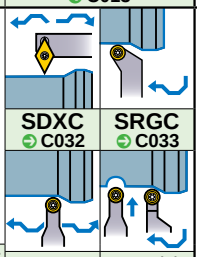
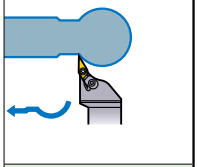
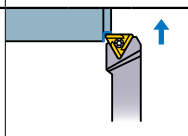
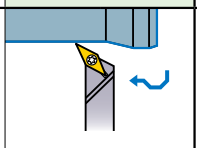
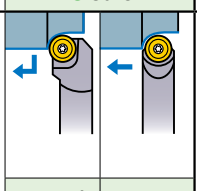
- **CN○○** INSERTS TOOL HOLDERS C006
- **DN○○** INSERTS TOOL HOLDERS C010
- **RN○○** INSERTS TOOL HOLDERS C013
- **SN○○** INSERTS TOOL HOLDERS C014
- **TN○○** INSERTS TOOL HOLDERS C018
- **VN○○** INSERTS TOOL HOLDERS C024
- **WN○○** INSERTS TOOL HOLDERS C027
- **VB○○** INSERTS TOOL HOLDERS C028
- **CC○○** INSERTS TOOL HOLDERS C030
- **DC○○** INSERTS TOOL HOLDERS C031
- **RC○○** INSERTS TOOL HOLDERS C033
- **SC○○** INSERTS TOOL HOLDERS C034
- **TC○○** INSERTS TOOL HOLDERS C035
- **VC○○** INSERTS TOOL HOLDERS C036
- **WC○○** INSERTS TOOL HOLDERS C037
- **XC○○** INSERTS TOOL HOLDERS C038
- **RP○○** INSERTS TOOL HOLDERS C040
- **DE○○** INSERTS TOOL HOLDERS C041
- **TE○○** INSERTS TOOL HOLDERS C042
- **VD○○** INSERTS TOOL HOLDERS C043
- **RG○○** INSERTS TOOL HOLDERS C044

*Arranged by Alphabetical order

C006	**DCLN**	C010	**MDJN**	C032	**SDXC**
C008	**DCRN**	C011	**MDPN**	C033	**SRDC**
C010	**DDJN**	C013	**MRGN**	C040	**SRDP**
C011	**DDPN**	C016	**MSDN**	C033	**SRGC**
C012	**DDQN**	C017	**MSKN**	C044	**SRSG**
C013	**DRGN**	C014	**MSRN**	C034	**SSBC**
C016	**DSDN**	C015	**MSSN**	C034	**SSSC**
C017	**DSKN**	C020	**MTAN**	C035	**STFC**
C014	**DSRN**	C021	**MTCN**	C042	**STFE**
C015	**DSSN**	C021	**MTEN**	C035	**STGC**
C022	**DTCN**	C023	**MTFN**	C042	**STGE**
C022	**DTFN**	C019	**MTGN**	C029	**SVHB**
C018	**DTGN**	C018	**MTJN**	C028	**SVJB**
C024	**DVJN**	C020	**MTRN**	C036	**SVJC**
C025	**DVPN**	C024	**MVJN**	C043	**SVJD**
C025	**DVVN**	C026	**MVLN**	C036	**SVPC**
C027	**DWLN**	C027	**MWLN**	C043	**SVPD**
C009	**MCFN**	C030	**SCLC**	C028	**SVVB**
C008	**MCGN**	C031	**SDJC**	C037	**SWLC**
C007	**MCLN**	C041	**SDJE**	C038	**SXZC**
C009	**MCRN**	C031	**SDNC**		

CLASSIFICATION

Tool Holder	Features	External Turning Facing	External Turning Copying		External Turning	
		KAPR= 95°	KAPR= 93°	KAPR= 62° 30' 72° 30'	KAPR= 90°—91°	
						
DOUBLE CLAMP Holder 	● New double clamp type. ● Holds inserts securely. ● Excellent cutting edge tolerance. ● Economical negative insert. ● Recommended with CBN grade insert					
		DCLN ➲ C006	**DWLN** ➲ C027	**DDJN** ➲ C010	**DVJN** ➲ C024	**DDPN** ➲ C011	**DVVN** ➲ C025	**DTGN** ➲ C018
M Holder 	● Negative rake clamp and locking pin toolholders. ● Insert is securely held by a shim pin and clamp bridge. ● Index operation is easy to perform. ● (Opt.) Single clamp available as clamp on or pin lock holder.					
		MCLN ➲ C007	**MWLN** ➲ C027	**MDJN** ➲ C010	**MTJN** ➲ C018	**MVJN** ➲ C024	**MDPN** ➲ C011	**MCGN** ➲ C008	**MTGN** ➲ C019	**MTAN** ➲ C020
SP Holder 	● Small shank toolholder system using a 5°,7° and 11° positive inserts retained by screw-on system.					
		SCLC ➲ C030	**SWLC** ➲ C037	**SDJC** ➲ C031	**SVJC** ➲ C036	**SVJB** ➲ C028	**SDNC** ➲ C031	**SVVB** ➲ C028	**STGC** ➲ C035
PROFILE Holder 	● 25° rhombic insert for profiling and face relief. ● Machine 300° of a sphere. ● Machine face relief to 60° angle. ● The cycle time can be reduced due to only one holder.					
AL Holder 	● Shank size .625 square thru 1.000 square with screw-on method. ● Suitable for finishing aluminum or non-ferrous metals and for chatter control on small diameters.					
			SDJE ➲ C041	**SVJD** ➲ C043		**STGE** ➲ C042
SR Holder 	● High positive cutting rake angle (24°) round insert retained by screw-on system. ● Rough machining of super alloys, stainless and tough-to-cut materials.					

External Turning		External Turning, Chamfering		External Turning, Facing, Chamfering	Facing		Facing Copying		External Turning, Copying	Selection Standard				
KAPR= 75°		KAPR=60°	KAPR= 45°	KAPR= 45°	PSIR= 15°	PSIR= 0°—-1°	PSIR= 5°–		Special Design	Economical	Low Cutting Resistance (Sharpness)	Clamp Rigidity	Operation Efficiency	Specialized
														
										◎		◎	◎	
DCRN ➲ C008	DSRN ➲ C014		DSDN ➲ C016	DSSN ➲ C015	DSKN ➲ C017	DTCN ➲ C022	DTFN ➲ C022	DVPN ➲ C025 / DDQN ➲ C012	DRGN ➲ C013					
										◎		○	◎	
MCRN ➲ C009	MSRN ➲ C014	MTRN ➲ C020	MTEN ➲ C021	MSDN ➲ C016	MSSN ➲ C015	MSKN ➲ C017	MCFN ➲ C009	MTCN ➲ C021	MTFN ➲ C023	MVLN ➲ C026	MRGN ➲ C013			
											○			
SSBC ➲ C034				SSSC ➲ C034		STFC ➲ C035	SVHB ➲ C029	SVPC ➲ C036	SDXC ➲ C032 / SRGC ➲ C033 / SRDC ➲ C033 / SRDPR/L/N ➲ C040					
												○		◎
									SXZC ➲ C038					
											◎			◎
						STFE ➲ C042			SVPD ➲ C043					
											○			◎
									SRSGR/L ➲ C044 / SRSGN ➲ C044					

(Note) ◎ : 1st recommendation. ○ : 2nd recommendation.

IDENTIFICATION

DOUBLE CLAMP Holder, M Holder, SP Holder, PROFILE Holder, AL Holder, SR Holder

① Method of Holding

D	M	S
Double Clamp Type	Multiple Clamp Type	Screw Clamp Type

② Insert Shape

C	D	R	S	T	V	W	X
80°Rhombic	55°Rhombic	Round	Square	Triangluar	35°Rhombic	Trigon	Special Design

③ Tool Style

A	B	D	E	F	G
90°	75°	45°	60°	90°	90°

J	K	L	N	Q	R
93°	75°	95° 95°	62°30´	15°	75°

S	T	V	X	Z	
45°	60°	72°30´	Special Design	Special Design	

M	C	L	N	R	–	16	5	D
①	②	③	④	⑤		⑥	⑦	⑧

④ Insert Relief Angle

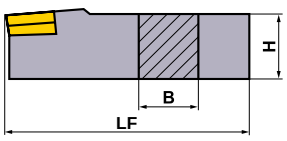
B	C	D	E	N	P
5°	7°	15°	20°	0°	11°

⑤ Hand of Tool

R	L	N

⑥ Tool Size [Height (H) and Width (B)] (inch)

	06	08	10	12	16	20	24	85
H	.375	.500	.625	.750	1.000	1.250	1.500	1.250
B	.375	.500	.625	.750	1.000	1.250	1.500	1.000



In case of B=H, the number will represent the number of sixteeths of B and H.
In case of B≠H, the first digit represents the number of eighths of B, and the second digit represents the number of quarters of H.

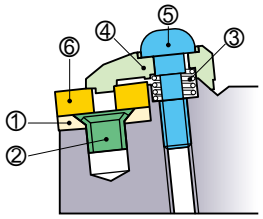
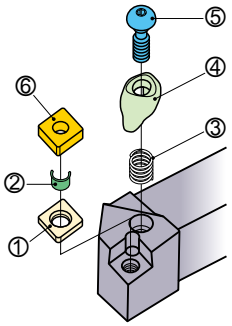
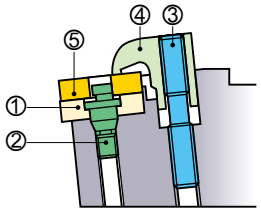
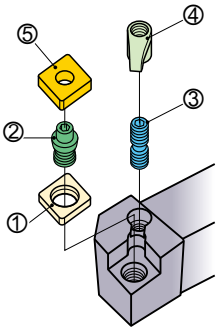
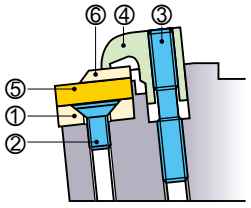
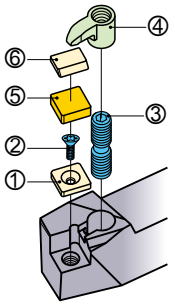
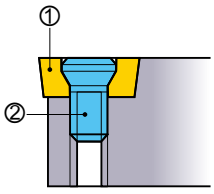
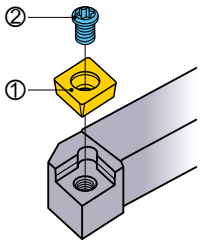
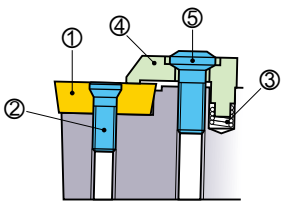
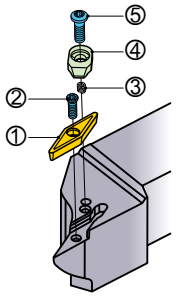
⑦ Insert Size

Inscribed Circle of Insert (inch)	.188	.219	.250	.313	.375	.500	.625	.750	1.000
T	1.5	1.8	2	2.5	3	4	5	6	8
S R			2	2.5	3	4	5	6	8
W			2	2.5	3	4	5	6	
80° C					3	4	5	6	8
55° D					3	4	5	6	8
35° V			2		3				

⑧ Tool Length (LF) (inch)

B	C	D	E
4.500	5.000	6.000	7.000

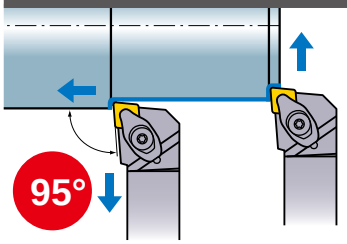
METHOD OF HOLDING

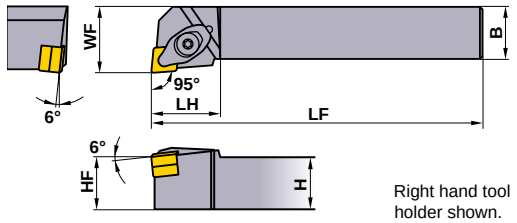
Type	Structure		
Double Clamp **(DOUBLE CLAMP Holder)**		①Shim ②Shim Pin ③Spring ④Clamp Bridge ⑤Clamp Screw ⑥Insert	
Multiple Clamp **For insert with hole** **(M Holder)**		①Shim ②Shim Pin ③Clamp Screw ④Clamp Bridge ⑤Insert	
Multiple Clamp **For insert without hole** (Opt.) **(M Holder)**		①Shim ②Shim Screw ③Clamp Screw ④Clamp Bridge ⑤Insert ⑥Chipbreaker	
Screw Clamp **(SP Holder** **AL Holder** **SR Holder)**		①Insert ②Insert Screw	
Double Clamp with **Screw and Clamp Bridge** **(PROFILE Holder)**		①Insert ②Insert Screw ③Spring ④Clamp Bridge ⑤Clamp Screw	

CN□□ INSERTS TOOL HOLDERS

DCLN

External turning ***DOUBLE CLAMP Type***
Facing





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(4)	(4)	(4)	(4)
Medium	**Medium to Rough**	**Stainless**	**CBN**
Standard	RP	MS	
			
(3,4)	(4)	(4)	(4)

Order Number	Stock		Insert Number		Dimensions (inch)										 *2	
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
DCLNR/L-123	●	●	CNMA CNMG CNMM CNGG	32◌	.750	.750	4.500	1.000	.750	1.000	LLSCN33 *1 (LLSCN32)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DCLNR/L**-124**	●	●		43◌	.750	.750	4.500	1.250	.750	1.000	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DCLNR/L**-163**	●	●		32◌	1.000	1.000	6.000	1.000	1.000	1.250	LLSCN33 *1 (LLSCN32)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DCLNR/L**-164**	●	●		43◌	1.000	1.000	6.000	1.250	1.000	1.250	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DCLNR/L**-204**	●	●		43◌	1.250	1.250	6.000	1.250	1.250	1.500	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DCLNR/L**-244**	●	●		43◌	1.500	1.500	6.000	1.250	1.500	2.000	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

*1 Please use shim no.LLSCN32 with .187inch thick insert. When using .187inch thick inserts, the shim must be ordered separately.
*2 Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

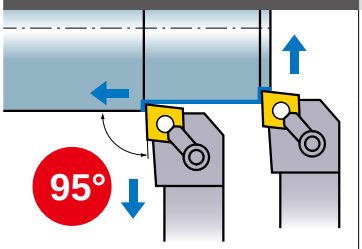
DCLN type inserts ➤ **A096–A102**
CBN & PCD inserts ➤ **B022, B023, B051**
CUTTING CONDITIONS ➤ **A074**

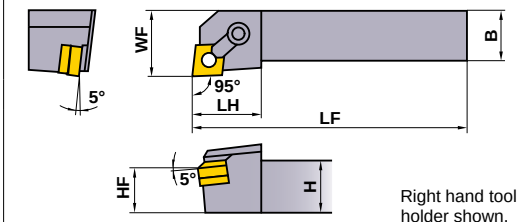
● : **Inventory maintained.**

MCLN

External turning
Facing

Multiple Clamp Type
***M* Holder**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(4)	(4)	(4,5)	(4,5,6)
Medium	**Medium to Rough**	**Stainless**	**CBN**
Standard	RP	MS	
			
(3,4,5,6)	(4)	(3,4,5,6)	(4)

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw ★3
	R	L			H	B	LF	LH	HF	WF				
MCLNR/L-123	●	●	CNMA CNMG CNMM CNGG	32◌	.750	.750	4.500	1.187	.750	1.000	ICSN322	NL34	CL7	XNS36
MCLNR/L**-124B**	●	●		43◌ ★2	.750	.750	4.500	1.250	.750	1.000	ICSN433 ★1	NL46	CL20	XNS48
MCLNR/L**-163**	●	●		32◌	1.000	1.000	6.000	1.187	1.000	1.250	ICSN322	NL34	CL7	XNS36
MCLNR/L**-164C**	●	●		43◌ ★2	1.000	1.000	5.000	1.250	1.000	1.250	ICSN433 ★1	NL46	CL20	XNS48
MCLNR/L**-164D**	●	●		43◌ ★2	1.000	1.000	6.000	1.250	1.000	1.250	ICSN433 ★1	NL46	CL20	XNS48
MCLNR/L**-165C**	●	●		54◌	1.000	1.000	5.000	1.375	1.000	1.250	ICSN533	NL58	CL12	XNS510
MCLNR/L**-165D**	●	●		54◌	1.000	1.000	6.000	1.375	1.000	1.250	ICSN533	NL58	CL12	XNS510
MCLNR/L**-166C**	●	●		64◌	1.000	1.000	5.000	1.500	1.000	1.250	ICSN633	NL68	CL12	XNS510
MCLNR/L**-166D**	●	●		64◌	1.000	1.000	6.000	1.500	1.000	1.250	ICSN633	NL68	CL12	XNS510
MCLNR/L**-204D**	●	●		43◌ ★2	1.250	1.250	6.000	1.187	1.250	1.500	ICSN433 ★1	NL46	CL20	XNS48
MCLNR/L**-205D**	●	●		54◌	1.250	1.250	6.000	1.375	1.250	1.500	ICSN533	NL58	CL12	XNS510
MCLNR/L**-206D**	●	●		64◌	1.250	1.250	6.000	1.500	1.250	1.500	ICSN633	NL68	CL12	XNS510
MCLNR/L**-244D**	●	●		43◌ ★2	1.500	1.500	6.000	1.187	1.500	2.000	ICSN433 ★1	NL46	CL20	XNS48
MCLNR/L**-244E**	●	●		43◌ ★2	1.500	1.500	7.000	1.187	1.500	2.000	ICSN433 ★1	NL46	CL20	XNS48
MCLNR/L**-246D**	●	●		64◌	1.500	1.500	6.000	1.500	1.500	2.000	ICSN633	NL68	CL12	XNS510
MCLNR/L**-246E**	●	●		64◌	1.500	1.500	7.000	1.500	1.500	2.000	ICSN633	NL68	CL12	XNS510
MCLNR/L**-854D**	●	●		43◌ ★2	1.250	1.000	6.000	1.187	1.250	1.250	ICSN433 ★1	NL46	CL20	XNS48
MCLNR/L**-856D**	●	●		64◌	1.250	1.000	6.000	1.500	1.250	1.250	ICSN633	NL68	CL12	XNS510

★1 (Opt.) See page M009 for different radius.

★2 For inserts without hole, remove shim pin and add below.

Shim Screw	Chipbreaker
S46	CBC4

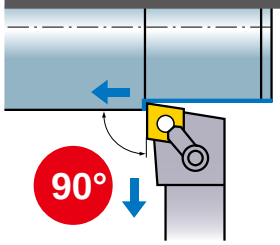
★3 Clamp Torque (lbf-in) : XNS36=30, XNS48=45, XNS510=70

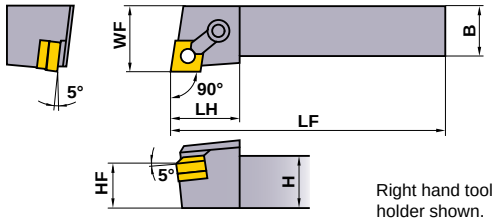
MCLN type inserts	**➤ A096–A102**
CBN & PCD inserts	**➤ B022, B023, B051**
CUTTING CONDITIONS	**➤ A074**
SPARE PARTS	**➤ M001**
TECHNICAL DATA	**➤ N001**

CN□□ INSERTS TOOL HOLDERS

MCGN

External turning — ***Multiple Clamp Type*** — ***M*** **Holder**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(4)	(4)	(4,5)	(4,5,6)
Medium	**Medium to Rough**	**Stainless**	**CBN**
Standard	RP	MM	
			
(4,5,6)	(4,5,6)	(4,5,6)	(4)

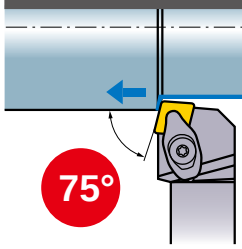
Order Number	Stock		Insert Number		Dimensions (inch)									 *3
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw
MCGNR/L-124	□	□	CNMA CNMG CNMM CNGG	43◌ *2	.750	.750	4.500	1.250	.750	1.000	ICSN433 *1	NL46	CL20	XNS48
MCGNR/L**-164C**	□	□		43◌ *2	1.000	1.000	5.000	1.250	1.000	1.250	ICSN433 *1	NL46	CL20	XNS48
MCGNR/L**-164D**	●	●		43◌ *2	1.000	1.000	6.000	1.250	1.000	1.250	ICSN433 *1	NL46	CL20	XNS48
MCGNR/L**-165D**	●	●		54◌	1.000	1.000	6.000	1.313	1.000	1.250	ICSN533	NL58	CL12	XNS510
MCGNR/L**-166D**	□	□		64◌	1.000	1.000	6.000	1.625	1.000	1.250	ICSN633	NL68	CL9	XNS510

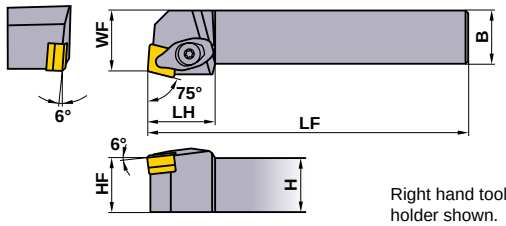
*1 (Opt.) See page M009 for different radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : XNS48=45, XNS510=70

Shim Screw	Chipbreaker
S46	CBC4

DCRN

External turning — ***DOUBLE CLAMP Type***





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(4)	(4)	(4)	(4)
Medium	**Medium to Rough**	**Stainless**	
Standard	RP	MM	
			
(4)	(4)	(4)	

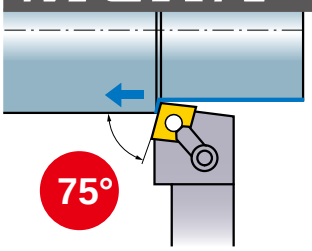
Order Number	Stock		Insert Number		Dimensions (inch)										 *	
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
DCRNR/L-124	●	●	CNMA CNMG	43◌	.750	.750	4.500	1.250	.750	.888	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DCRNR/L**-164**	●	●	CNMM CNGG	43◌	1.000	1.000	6.000	1.250	1.000	1.128	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

* Clamp Torque (lbf-in) : DC0621T=44

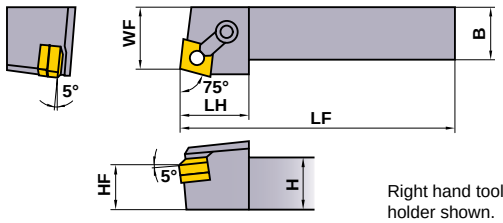
MCGN type inserts	**➤ A096–A102**
DCRN type inserts	**➤ A096–A102**
CBN & PCD inserts	**➤ B022, B023, B051**
CUTTING CONDITIONS	**➤ A074**

● : Inventory maintained.
□ : Non stock, produced to order only.

MCRN



External turning — ***Multiple Clamp Type*** — ***M* Holder**



Right hand tool holder shown.

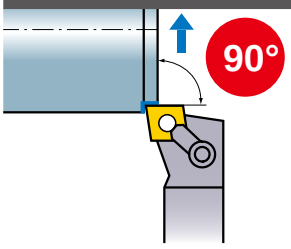
Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(4)	(4)	(4,5)	(4,5,6)
Medium	**Medium to Rough**	**Stainless**	
Standard	RP	MS	
			
(4,5,6)	(4)	(4,5)	

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw ✶3
	R	L			H	B	LF	LH	HF	WF				
MCRNR/L-124B	●	□	CNMA CNMG CNMM CNGG	43◌ ✶2	.750	.750	4.500	1.250	.750	.750	ICSN433 ✶1	NL46	CL20	XNS48
MCRNR/L**-164C**	●	●		43◌ ✶2	1.000	1.000	5.000	1.250	1.000	1.250	ICSN433 ✶1	NL46	CL20	XNS48
MCRNR/L**-164D**	●	●		43◌ ✶2	1.000	1.000	6.000	1.250	1.000	1.250	ICSN433 ✶1	NL46	CL20	XNS48
MCRNR/L**-165D**	●	□		54◌	1.000	1.000	6.000	1.343	1.000	1.250	ICSN533	NL58	CL9	XNS510
MCRNR/L**-166D**	□	□		64◌	1.000	1.000	6.000	1.343	1.000	1.250	ICSN633	NL68	CL12	XNS510

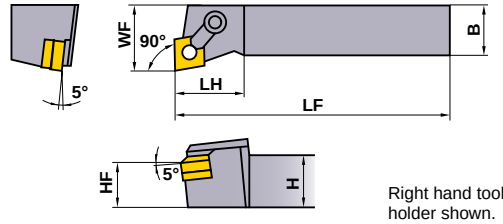
✶1 (Opt.) See page M009 for different radius.
✶2 For inserts without hole, remove shim pin and add below.
✶3 Clamp Torque (lbf-in) : XNS48=45, XNS510=70

Shim Screw	Chipbreaker
S46	CBC4

MCFN



Facing — ***Multiple Clamp Type*** — ***M* Holder**



Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(4)	(4)	(4,5)	(4,5,6)
Medium	**Medium to Rough**	**Stainless**	**CBN**
Standard	RP	MS	
			
(4,5,6)	(4)	(4,5)	(4)

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw ✶3
	R	L			H	B	LF	LH	HF	WF				
MCFNR/L-124	□	□	CNMA CNMG CNMM CNGG	43◌ ✶2	.750	.750	4.500	1.250	.750	1.000	ICSN433 ✶1	NL46	CL20	XNS48
MCFNR/L**-164C**	●	●		43◌ ✶2	1.000	1.000	5.000	1.250	1.000	1.250	ICSN433 ✶1	NL46	CL20	XNS48
MCFNR/L**-164D**	□	□		43◌ ✶2	1.000	1.000	6.000	1.250	1.000	1.250	ICSN433 ✶1	NL46	CL20	XNS48
MCFNR/L**-165D**	●	●		54◌	1.000	1.000	6.000	1.380	1.000	1.250	ICSN533	NL58	CL12	XNS510
MCFNR/L**-166D**	□	□		64◌	1.000	1.000	6.000	1.500	1.000	1.250	ICSN633	NL68	CL9	XNS510

✶1 (Opt.) See page M009 for different radius.
✶2 For inserts without hole, remove shim pin and add below.
✶3 Clamp Torque (lbf-in) : XNS48=45, XNS510=70

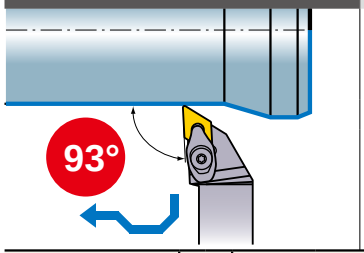
Shim Screw	Chipbreaker
S46	CBC4

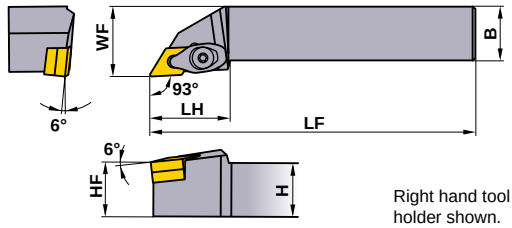
MCRN type inserts	➤ A096–A102	**CUTTING CONDITIONS**	➤ A074
MCFN type inserts	➤ A096–A102	**SPARE PARTS**	➤ M001
CBN & PCD inserts	➤ B022, B023, B051	**TECHNICAL DATA**	➤ N001

DN□□ INSERTS TOOL HOLDERS

DDJN

External turning Copying ***DOUBLE CLAMP Type***





Right hand tool holder shown.

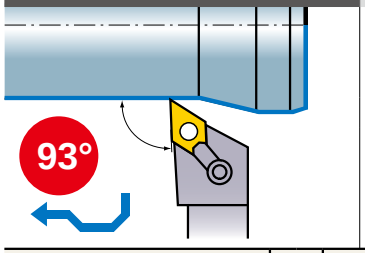
Finish	Light	Medium	Medium
FH	LP	MP	MK
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	G Class	CBN
RP	MS	MJ	
(4)	(4)	(4)	(4)

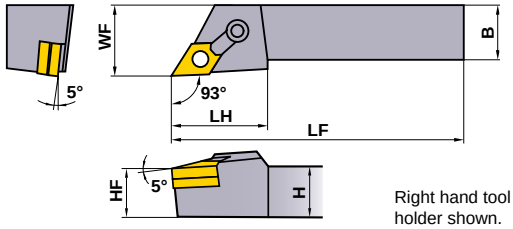
Order Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *2	Wrench
DDJNR/L-123	●	●	DNMA DNMG DNMM DNGA DNGG DNGM DNMX	33○	.750	.750	4.500	1.188	.750	1.000	LLSDN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DDJNR/L**-124**	●	●		43○	.750	.750	4.500	1.375	.750	1.000	LLSDN43 (LLSDN42) *1	LLP24 (LLP14) *1	DCK2613	DCS1	DC0621T	TKY20F
DDJNR/L**-163**	●	●		33○	1.000	1.000	6.000	1.188	1.000	1.250	LLSDN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DDJNR/L**-164**	●	●		43○	1.000	1.000	6.000	1.375	1.000	1.250	LLSDN43 (LLSDN42) *1	LLP24 (LLP14) *1	DCK2613	DCS1	DC0621T	TKY20F
DDJNR/L**-204**	●	●		43○	1.250	1.250	6.000	1.375	1.250	1.500	LLSDN43 (LLSDN42) *1	LLP24 (LLP14) *1	DCK2613	DCS1	DC0621T	TKY20F
DDJNR/L**-244**	●	●		43○	1.500	1.500	6.000	1.500	1.500	2.000	LLSDN43 (LLSDN42) *1	LLP24 (LLP14) *1	DCK2613	DCS1	DC0621T	TKY20F

*1 Please use shim no.LLSDN42 and shim pin LLP14 with .25inch thick insert. When using .25inch thick inserts, the shim and shim pin must be ordered separately.
*2 Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

MDJN

External turning Copying ***Multiple Clamp Type*** ***M* Holder**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MK
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	G Class	CBN
RP	MS	MJ	
(4)	(4)	(4)	(4)

Order Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *2
MDJNR/L-123	●	●	DNMA DNMG DNMM DNGA DNGG DNGM DNMX	33○	.750	.750	4.500	1.250	.750	1.000	IDSN322	NL33L	CL7	XNS36
MDJNR/L**-124B**	●	●		43○	.750	.750	4.500	1.250	.750	1.000	IDSN433	NL46	CL7	XNS36
MDJNR/L**-163**	●	●		33○	1.000	1.000	5.000	1.250	1.000	1.250	IDSN322	NL33L	CL7	XNS36
MDJNR/L**-164C**	●	●		43○	1.000	1.000	5.000	1.250	1.000	1.250	IDSN433	NL46	CL20	XNS48
MDJNR/L**-164D**	●	●		43○	1.000	1.000	6.000	1.250	1.000	1.250	IDSN433	NL46	CL20	XNS48
MDJNR/L**-165D**	●	●		54○ *1	1.000	1.000	6.000	1.469	1.000	1.250	IDSN533 *1	NL58	CL12	XNS510
MDJNR/L**-204D**	●	●		43○	1.250	1.250	6.000	1.250	1.250	1.500	IDSN433	NL46	CL20	XNS48
MDJNR/L**-205D**	●	●		54○ *1	1.250	1.250	6.000	1.469	1.250	1.500	IDSN533 *1	NL58	CL12	XNS510
MDJNR/L**-244D**	●	●		43○	1.500	1.500	6.000	1.250	1.500	2.000	IDSN433	NL46	CL20	XNS48

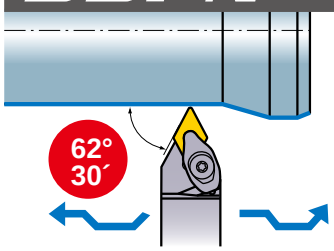
*1 (Opt.) See page M009 for different thickness.
*2 Clamp Torque (lbf-in) : XNS36=30, XNS48=45, XNS510=70
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

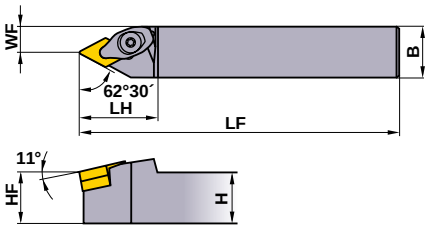
DDJN type inserts	➤ A103–A109	CUTTING CONDITIONS	➤ A074
MDJN type inserts	➤ A103–A109	CBN & PCD inserts	➤ B024–B026, B051

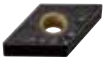
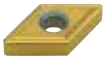
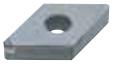
● : Inventory maintained.

DDPN

External turning **Copying** ***DOUBLE CLAMP Type***





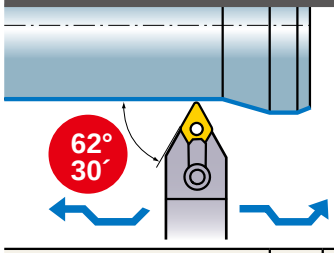
Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	G Class	CBN
RP	MS	MJ	
			
(4)	(4)	(4)	(4)

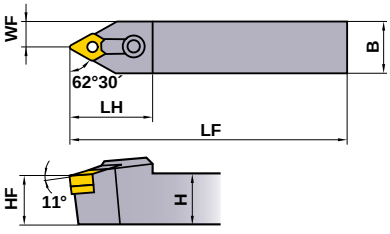
Order Number	Stock	Insert Number	Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw ✶2	Wrench
			H	B	LF	LH	HF	WF						
DDPNN-164	●	DNMA DNMG DNMM DNGA DNGG DNGM 43◌	1.000	1.000	6.000	1.500	1.000	.500	LLSDN43 ✶1 (LLSDN42)	LLP24 ✶1 (LLP14)	DCK2613	DCS1	DC0621T	TKY20F

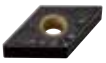
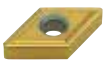
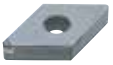
✶1 Please use shim no.LLSDN42 and shim pin LLP14 with .25inch thick insert. When using .25inch thick inserts, the shim and shim pin must be ordered separately.
✶2 Clamp Torque (lbf-in) : DC0621T=44

MDPN

External turning **Copying** ***Multiple Clamp Type*** ***M* Holder**





Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	G Class	CBN
RP	MS	MJ	
			
(4)	(4)	(4)	(4)

Order Number	Stock	Insert Number	Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw ✶2
			H	B	LF	LH	HF	WF				
MDPNN-164D	●	DNMA DNMG DNMM DNGA DNGG DNGM 43◌	1.000	1.000	6.000	1.750	1.000	.500	IDSN433	NL46	CL12	XNS510
MDPNN-165D	●	DNMA DNMG DNMM DNGA DNGG DNGM 54◌ ✶1	1.000	1.000	6.000	1.922	1.000	.500	IDSN533 ✶1	NL58	CL12	XNS510

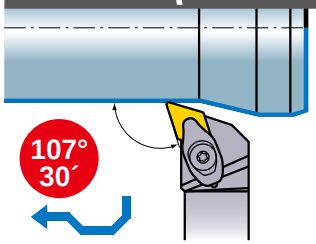
✶1 (Opt.) See page M009 for different thickness.
✶2 Clamp Torque (lbf-in) : XNS510=70

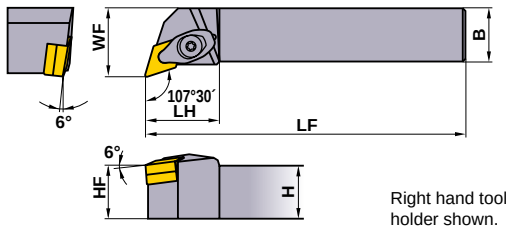
DDPN type inserts	➤ A103–A109	CUTTING CONDITIONS	➤ A074
MDPN type inserts	➤ A103–A109	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B024–B026, B051	TECHNICAL DATA	➤ N001

DN□□ INSERTS TOOL HOLDERS

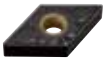
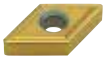
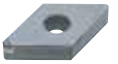
DDQN

External turning ***DOUBLE CLAMP Type***
Copying





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	G Class	CBN
RP	MS	MJ	
			
(4)	(4)	(4)	(4)

Order Number	Stock		Insert Number	Dimensions (inch)										 ✶2	
	R	L		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
DDQNR/L-164	●	●	DNMA DNMG DNMM DNGA DNGG DNGM 43○	1.000	1.000	6.000	1.375	1.000	1.250	LLSDN43 ✶1 (LLSDN42)	LLP24 ✶1 (LLP14)	DCK2613	DCS1	DC0621T	TKY20F

✶1 Please use shim no.LLSDN42 and shim pin LLP14 with .25inch thick insert. When using .25inch thick inserts, the shim and shim pin must be ordered separately.
✶2 Clamp Torque (lbf-in) : DC0621T=44

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

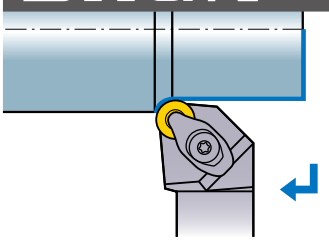
● : **Inventory maintained.**
□ : **Non stock, produced to order only.**

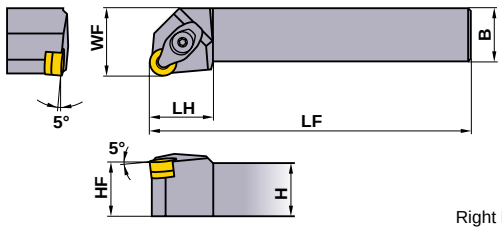
DDQN type inserts	**➤ A103–A109**
CBN & PCD inserts	**➤ B024–B026, B051**
CUTTING CONDITIONS	**➤ A074**

DRGN

External turning
Copying

DOUBLE CLAMP Type





Right hand tool holder shown.

Medium
Standard

(4)

Medium
Flat top

(4)

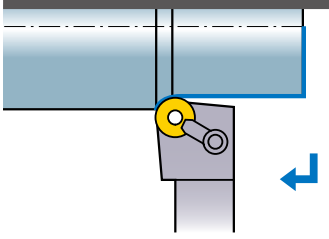
Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
	R	L			H	B	LF	LH	HF	WF						
DRGNR/L-124	●	●	RNMG	43◌	.750	.750	4.500	1.188	.750	1.000	LLSRN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DRGNR/L**-164**	●	●		43◌	1.000	1.000	6.000	1.188	1.000	1.250	LLSRN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DRGNR/L**-204**	●	●		43◌	1.250	1.250	6.000	1.188	1.250	1.500	LLSRN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

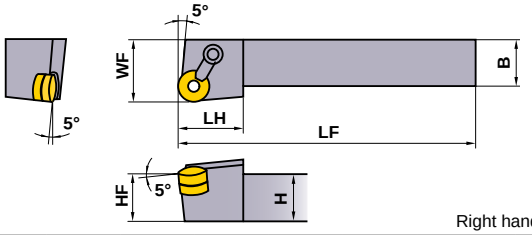
∗ Clamp Torque (lbf-in) : DC0621T=44

MRGN

External turning
Copying

Multiple Clamp Type
***M* Holder**





Right hand tool holder shown.

Medium
Standard

(3,4,6)

Medium
Flat top

(4)

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
	R	L			H	B	LF	LH	HF	WF				
MRGNR/L-123B	□	●	RNMG	32	.750	.750	4.500	.937	.750	1.000	IRSN32	NL33	CL6	XNS36
MRGNR/L**-124B**	●	□		43 ∗1 ∗2	.750	.750	4.500	1.187	.750	1.000	IRSN43 ∗1	NL46	CL9	XNS59
MRGNR/L**-163**	□	□		32	1.000	1.000	6.000	.937	1.000	1.250	IRSN32	NL34	CL6	XNS36
MRGNR/L**-164C**	●	●		43 ∗1 ∗2	1.000	1.000	5.000	1.187	1.000	1.250	IRSN43 ∗1	NL46	CL9	XNS59
MRGNR/L**-164D**	●	●		43 ∗1 ∗2	1.000	1.000	6.000	1.187	1.000	1.250	IRSN43 ∗1	NL46	CL9	XNS59
MRGNR/L**-204D**	●	□		43 ∗1 ∗2	1.250	1.250	6.000	1.187	1.250	1.500	IRSN43 ∗1	NL46	CL9	XNS59
MRGNR/L**-206D**	□	□		64	1.250	1.250	6.000	1.125	1.250	1.500	IRSN63	NL68	CL12	XNS58
MRGNR/L**-246**	□	□		64	1.500	1.500	7.000	1.125	1.500	2.000	IRSN63	NL68	CL12	XNS58

∗1 (Opt.) See page M009 for different thickness.
∗2 For inserts without hole, remove shim pin and add below.
∗3 Clamp Torque (lbf-in) : XNS36=30, XNS58=70, XNS59=70

Shim Screw	Chipbreaker
S46	CBR4

DRGN type inserts ➤ A110
MRGN type inserts ➤ A110

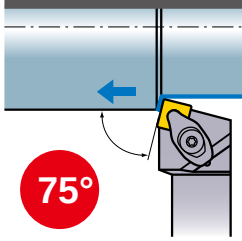
CUTTING CONDITIONS ➤ A074
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

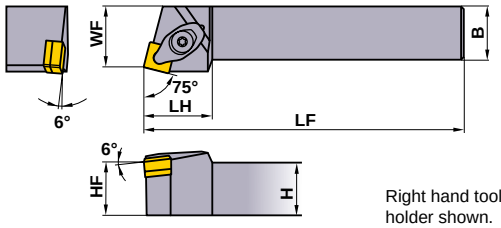
SN○○ INSERTS TOOL HOLDERS

DSRN

DOUBLE CLAMP Type

External turning





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	CBN	
RP	MS		
			
(4)	(4)	(4)	

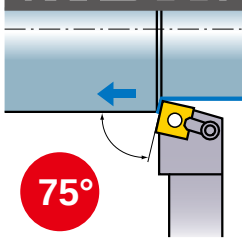
Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
	R	L			H	B	LF	LH	HF	WF						
DSRNR/L-124	●	●	SNMA SNMG SNMM SNGA SNGG	43○	.750	.750	4.500	1.250	.750	.878	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DSRNR/L-164	●	●		43○	1.000	1.000	6.000	1.250	1.000	1.128	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

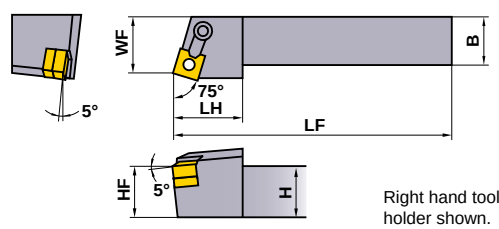
∗ Clamp Torque (lbf-in) : DC0621T=44

MSRN

Multiple Clamp Type

External turning — *M* Holder





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(3,4)	(4)	(4)	(4,6)
Medium to Rough	Stainless	CBN	
RP	MS		
			
(4)	(4,5)	(4)	

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
	R	L			H	B	LF	LH	HF	WF				
MSRNR/L-83	□	□	SNMA SNMG SNMM SNGA SNGG	32○ *1 *2	.500	.500	4.500	1.062	.500	.658	ISSN322 *1	NL34	CL6	XNS36
MSRNR/L-103	□	□		32○ *1 *2	.625	.625	4.500	1.062	.625	.783	ISSN322 *1	NL34	CL6	XNS36
MSRNR/L-123	●	●		32○ *1 *2	.750	.750	4.500	1.062	.750	.908	ISSN322 *1	NL34	CL6	XNS36
MSRNR/L-124B	●	●		43○ *1 *2	.750	.750	4.500	1.234	.750	.878	ISSN433 *1	NL46	CL9	XNS59
MSRNR/L-164C	●	●		43○ *1 *2	1.000	1.000	5.000	1.234	1.000	1.128	ISSN433 *1	NL46	CL9	XNS59
MSRNR/L-164D	●	●		43○ *1 *2	1.000	1.000	6.000	1.234	1.000	1.128	ISSN433 *1	NL46	CL9	XNS59
MSRNR/L-165	●	●		54○	1.000	1.000	6.000	1.343	1.000	1.100	ISSN533	NL58	CL12	XNS510
MSRNR/L-165C	●	●		54○	1.000	1.000	5.000	1.343	1.000	1.100	ISSN533	NL58	CL12	XNS510
MSRNR/L-166	●	●		64○ *1	1.000	1.000	6.000	1.500	1.000	1.068	ISSN633 *1	NL68	CL12	XNS510
MSRNR/L-205D	●	●		54○	1.250	1.250	6.000	1.343	1.250	1.350	ISSN533	NL58	CL12	XNS510
MSRNR/L-206D	●	●		64○ *1	1.250	1.250	6.000	1.500	1.250	1.312	ISSN633 *1	NL68	CL12	XNS510
MSRNR/L-246D	●	●		64○ *1	1.500	1.500	6.000	1.500	1.500	1.818	ISSN633 *1	NL68	CL12	XNS510
MSRNR/L-246E	●	●		64○ *1	1.500	1.500	7.000	1.500	1.500	1.818	ISSN633 *1	NL68	CL12	XNS510
MSRNR/L-248	●	●		86○	1.500	1.500	7.000	1.625	1.500	1.768	ISSN846	NL810	CL24	XNS610

∗1 (Opt.) See page M010 for different thickness or radius.

∗2 For inserts without hole, remove shim pin and add below.

Insert	Shim Screw	Chipbreaker
SN○N3○○	S34	CBS3
SN○N4○○	S46	CBS4

∗3 Clamp Torque (lbf-in) : XNS36=30, XNS59=70, XNS510=70, XNS610=135

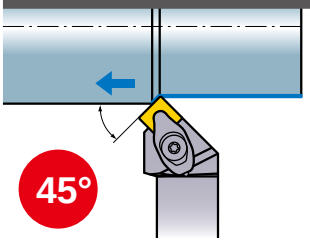
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

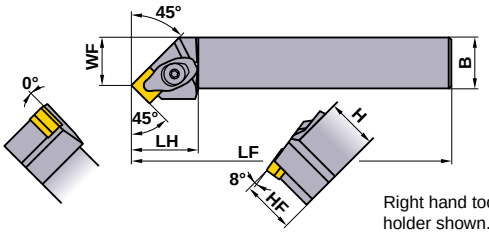
● : Inventory maintained.
□ : Non stock, produced to order only.

DSRN type inserts ➤ A111–A116
MSRN type inserts ➤ A111–A116
CBN & PCD inserts ➤ B027, B052
CUTTING CONDITIONS ➤ A074

DSSN

External turning **Chamfering** ***DOUBLE CLAMP Type***





Right hand tool holder shown.

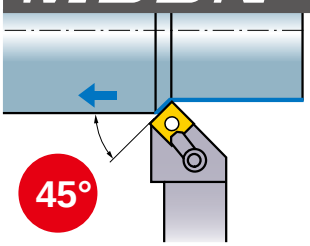
Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	CBN	
RP	MS		
			
(4)	(4)	(4)	

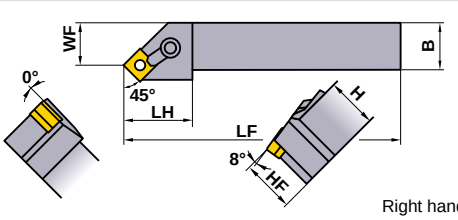
Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
	R	L			H	B	LF	LH	HF	WF						
DSSNR/L-124	●	●	SNMA SNMG SNMM SNGA SNGG	43◌	.750	.750	4.500	1.250	.750	.659	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DSSNR/L**-164**	●	●		43◌	1.000	1.000	6.000	1.250	1.000	.909	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

∗ Clamp Torque (lbf-in) : DC0621T=44

MSSN

External turning **Chamfering** ***Multiple Clamp Type*** ***M* Holder**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(3,4)	(4)	(4)	(4,6)
Medium to Rough	Stainless	CBN	
RP	MS		
			
(4)	(4,5)	(4)	

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
	R	L			H	B	LF	LH	HF	WF				
MSSNR/L-83	□	□	SNMA SNMG SNMM SNGA SNGG	32◌ ∗1 ∗2	.500	.500	4.500	1.062	.500	.391	ISSN322 ∗1	NL34	CL6	XNS36
MSSNR/L**-124B**	●	□		43◌ ∗1 ∗2	.750	.750	4.500	1.234	.750	.662	ISSN433 ∗1	NL46	CL9	XNS59
MSSNR/L**-164C**	□	□		43◌ ∗1 ∗2	1.000	1.000	5.000	1.234	1.000	.912	ISSN433 ∗1	NL46	CL9	XNS59
MSSNR/L**-164D**	●	●		43◌ ∗1 ∗2	1.000	1.000	6.000	1.234	1.000	.912	ISSN433 ∗1	NL46	CL9	XNS59
MSSNR/L**-205D**	□	□		54◌	1.250	1.250	6.000	1.375	1.250	1.078	ISSN533	NL58	CL9	XNS510
MSSNR/L**-206D**	□	□		64◌ ∗1	1.250	1.250	6.000	1.484	1.250	.992	ISSN633 ∗1	NL68	CL9	XNS510

∗1 (Opt.) See page M010 for different thickness or radius.

∗2 For inserts without hole, remove shim pin and add below.

Insert	Shim Screw	Chipbreaker
SN◌N3◌◌	S34	CBS3D
SN◌N4◌◌	S46	CBS4D

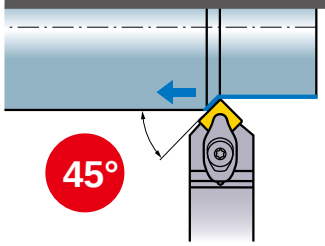
∗3 Clamp Torque (lbf-in) : XNS36=30, XNS59=70, XNS510=70

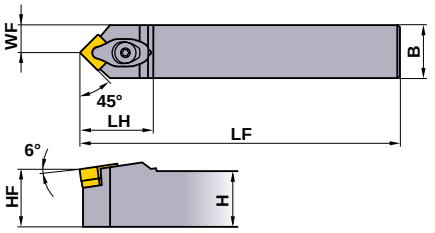
DSSN type inserts	**➤ A111–A116**	**CUTTING CONDITIONS**	**➤ A074**
MSSN type inserts	**➤ A111–A116**	**SPARE PARTS**	**➤ M001**
CBN & PCD inserts	**➤ B027, B052**	**TECHNICAL DATA**	**➤ N001**

SN○○ INSERTS TOOL HOLDERS

DSDN

External turning Chamfering ***DOUBLE CLAMP Type***





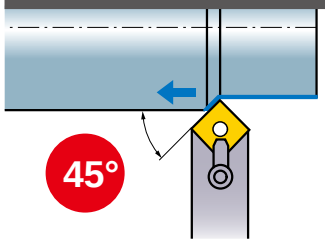
Finish	Light	Medium	Medium
FH	LP	MP	MK
 (4)	 (4)	 (4)	 (4)
Medium to Rough	Stainless	CBN	
RP	MS		
 (4)	 (4)	 (4)	

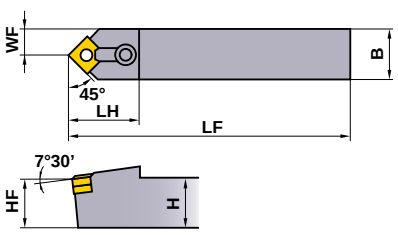
Order Number	Stock	Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw*	Wrench
				H	B	LF	LH	HF	WF						
DSDNN-124	●	SNMA SNMG SNMM SNGA SNGG	43○	.750	.750	4.500	1.375	.750	.375	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DSDNN**-164**	●		43○	1.000	1.000	6.000	1.375	1.000	.500	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

∗ Clamp Torque (lbf-in) : DC0621T=44

MSDN

External turning Chamfering ***Multiple Clamp Type*** ***M*** **Holder**





Finish	Light	Medium	Medium
FH	LP	MP	MK
 (3,4)	 (4)	 (4)	 (4,5,6)
Medium to Rough	Stainless	CBN	
GH	MS		
 (4,5,6)	 (3,4,5,6)	 (4)	

Order Number	Stock	Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw*3
				H	B	LF	LH	HF	WF				
MSDNN-83	●	SNMA SNMG SNMM SNGA SNGG	32○ ∗1 ∗2	.500	.500	4.500	1.000	.500	.250	ISSN322 ∗1	NL34	CL6	XNS36
MSDNN**-103**	□		32○ ∗1 ∗2	.625	.625	4.500	1.000	.625	.313	ISSN322 ∗1	NL34	CL6	XNS36
MSDNN**-123**	●		32○ ∗1 ∗2	.750	.750	4.500	1.000	.750	.375	ISSN322 ∗1	NL34	CL6	XNS36
MSDNN**-124**	●		43○ ∗1 ∗2	.750	.750	4.500	1.375	.750	.375	ISSN433 ∗1	NL46	CL9	XNS59
MSDNN**-164**	●		43○ ∗1 ∗2	1.000	1.000	6.000	1.375	1.000	.500	ISSN433 ∗1	NL46	CL9	XNS59
MSDNN**-165**	●		54○	1.000	1.000	6.000	1.625	1.000	.500	ISSN533	NL58	CL12	XNS510
MSDNN**-166**	●		64○ ∗1	1.000	1.000	6.000	1.625	1.000	.500	ISSN633 ∗1	NL68	CL12	XNS510
MSDNN**-206**	●		64○ ∗1	1.250	1.250	7.000	1.625	1.250	.625	ISSN633 ∗1	NL68	CL12	XNS510

∗1 (Opt.) See page M010 for different thickness or radius.

∗2 For inserts without hole, remove shim pin and add below.

∗3 Clamp Torque (lbf-in) : XNS36=30, XNS59=70, XNS510=70

Insert	Shim Screw	Chipbreaker
SN○N3○○	S34	CBS3D
SN○N4○○	S46	CBS4D

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

● : **Inventory maintained.**

□ : **Non stock, produced to order only.**

DSDN type inserts ➤ **A111–A116**

MSDN type inserts ➤ **A111–A116**

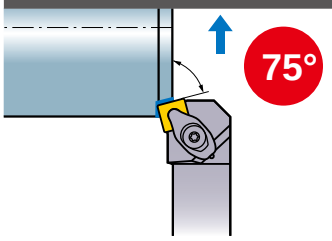
CBN & PCD inserts ➤ **B027, B052**

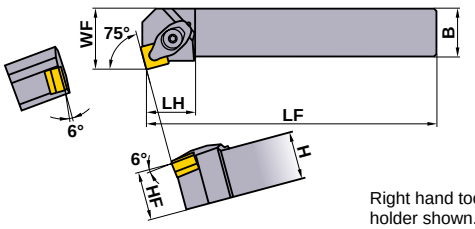
CUTTING CONDITIONS ➤ **A074**

DSKN

DOUBLE CLAMP Type

Facing





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	CBN	
RP	MS		
			
(4)	(4)	(4)	

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
	R	L			H	B	LF	LH	HF	WF						
DSKNR/L-124	●	●	SNMA SNMG SNMM SNGA SNGG	43◌	.750	.750	4.500	1.000	.750	1.000	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DSKNR/L-164	●	●		43◌	1.000	1.000	6.000	1.000	1.000	1.250	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

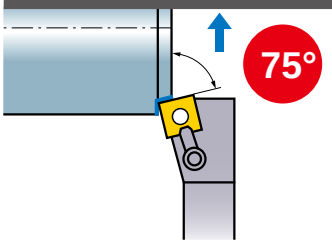
∗ Clamp Torque (lbf-in) : DC0621T=44

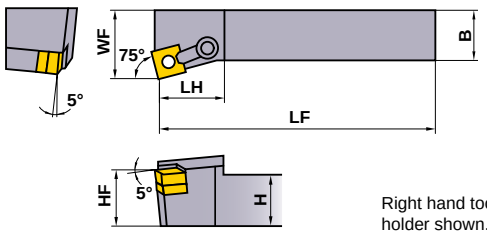
MSKN

Multiple Clamp Type

M **Holder**

Facing





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(3,4)	(4)	(4)	(4,5,6)
Medium to Rough	Stainless	CBN	
RP	MS		
			
(4)	(3,4,5,6)	(4)	

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
	R	L			H	B	LF	LH	HF	WF				
MSKNR/L-83	□	□	SNMA SNMG SNMM SNGA SNGG	32◌ ∗1 ∗2	.500	.500	4.500	1.000	.500	.625	ISSN322 ∗1	NL34	CL6	XNS36
MSKNR/L-103	□	□		32◌ ∗1 ∗2	.625	.625	4.500	1.000	.625	.750	ISSN322 ∗1	NL34	CL6	XNS36
MSKNR/L-123	□	□		32◌ ∗1 ∗2	.750	.750	4.500	1.000	.750	.875	ISSN322 ∗1	NL34	CL6	XNS36
MSKNR/L-124B	●	●		43◌ ∗1 ∗2	.750	.750	4.500	1.219	.750	1.000	ISSN433 ∗1	NL46	CL9	XNS59
MSKNR/L-164D	●	●		43◌ ∗1 ∗2	1.000	1.000	6.000	1.219	1.000	1.250	ISSN433 ∗1	NL46	CL9	XNS59
MSKNR/L-165D	●	●		54◌	1.000	1.000	6.000	1.344	1.000	1.250	ISSN533	NL58	CL12	XNS510
MSKNR/L-205D	●	●		54◌	1.250	1.250	6.000	1.344	1.250	1.500	ISSN533	NL58	CL12	XNS510
MSKNR/L-206D	□	□		64◌ ∗1	1.250	1.250	6.000	1.500	1.250	1.500	ISSN633	NL68	CL12	XNS510

∗1 (Opt.) See page M010 for different thickness or radius.

∗2 For inserts without hole, remove shim pin and add below.

∗3 Clamp Torque (lbf-in) : XNS36=30, XNS59=70, XNS510=70

Insert	Shim Screw	Chipbreaker
SN◌N3◌◌	S34	CBS3
SN◌N4◌◌	S46	CBS4

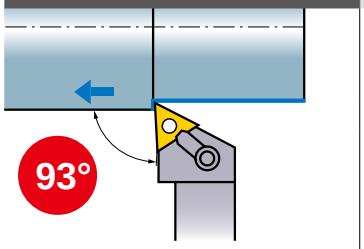
DSKN type inserts	**➤ A111–A116**
MSKN type inserts	**➤ A111–A116**
CBN & PCD inserts	**➤ B027, B052**

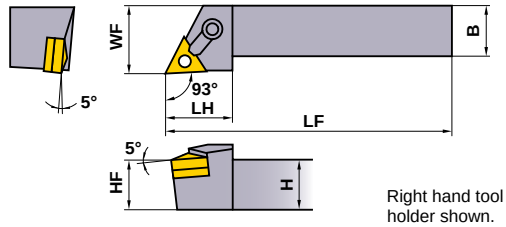
CUTTING CONDITIONS	**➤ A074**
SPARE PARTS	**➤ M001**
TECHNICAL DATA	**➤ N001**

TN□□ INSERTS TOOL HOLDERS

MTJN

External turning — ***Multiple Clamp Type*** — ***M*** **Holder**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Medium to Rough	Stainless	CBN
GH	RP	MS	
			
(3,4,5,6)	(3)	(3,4)	(3)

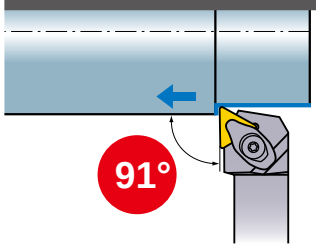
Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *2
	R	L			H	B	LF	LH	HF	WF				
MTJNR/L-123X	●	●	TNMA TNMG TNMX TNMM TNGA TNGG	33○ *1	.750	.750	4.500	1.000	.750	1.000	ITSN323 *1	NL34L	CL6	XNS36
MTJNR/L-163X	●	●		33○ *1	1.000	1.000	6.000	1.000	1.000	1.250	ITSN323 *1	NL34L	CL6	XNS36
MTJNR/L-164	●	●		43○ *1	1.000	1.000	6.000	1.200	1.000	1.250	ITSN432 *1	NL46	CL9	XNS510
MTJNR/L-165	□	●		54○ *1	1.000	1.000	6.000	1.375	1.000	1.250	ITSN533 *1	NL58	CL9	XNS510
MTJNR/L-204	●	●		43○ *1	1.250	1.250	6.000	1.200	1.250	1.500	ITSN432 *1	NL46	CL9	XNS510
MTJNR/L-205	●	●		54○ *1	1.250	1.250	6.000	1.375	1.250	1.500	ITSN533 *1	NL58	CL9	XNS510
MTJNR/L-245	●	●		54○ *1	1.500	1.500	7.000	1.375	1.500	2.000	ITSN533 *1	NL58	CL9	XNS510
MTJNR/L-246	●	□		66○ *1	1.500	1.500	7.000	1.375	1.500	2.000	ITSN636 *1	NL68L	CL12	XNS510
MTJNR/L-854	●	□		43○ *1	1.250	1.000	6.000	1.200	1.250	1.250	ITSN432 *1	NL46	CL9	XNS510

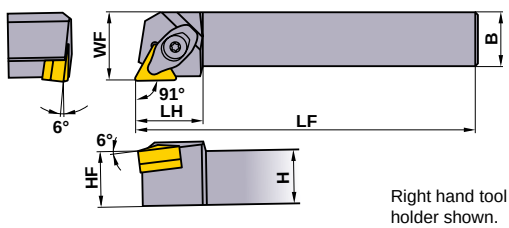
*1 (Opt.) See page M010 for different thickness or radius.
*2 Clamp Torque (lbf-in) : XNS36=30, XNS510=70

DTGN

DOUBLE CLAMP Type

External turning





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(3)	(3)	(3,4)	(3)
Medium to Rough	Stainless	CBN	
RP	MS		
			
(3,4)	(3,4)	(3)	

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *2	Wrench
	R	L			H	B	LF	LH	HF	WF						
DTGNR/L-123	●	●	TNMA TNMG TNMM TNGA TNGG	33○	.750	.750	4.500	1.000	.750	1.000	LLSTN32 (LLSTN33) *1	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DTGNR/L-163	●	●		33○	1.000	1.000	6.000	1.000	1.000	1.250	LLSTN32 (LLSTN33) *1	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DTGNR/L-164	●	●		43○	1.000	1.000	6.000	1.250	1.000	1.250	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DTGNR/L-204	●	●		43○	1.250	1.250	6.000	1.250	1.250	1.500	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DTGNR/L-244	●	●		43○	1.500	1.500	6.000	1.250	1.500	2.000	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

*1 Please use shim no.LLSTN33 with .125inch thick insert. When using .125inch thick inserts, the shim must be ordered separately.
*2 Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

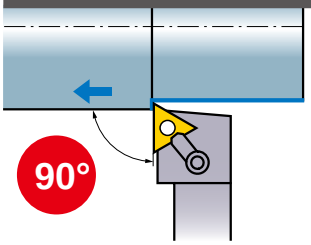
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

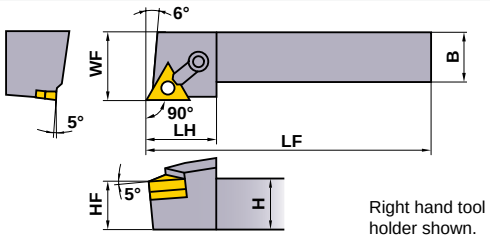
● : Inventory maintained.
□ : Non stock, produced to order only.

MTJN type inserts ➤ A117–A123
DTGN type inserts ➤ A117–A123
CBN & PCD inserts ➤ B028, B029, B052
CUTTING CONDITIONS ➤ A074

MTGN

External turning — ***Multiple Clamp Type*** ***M*** **Holder**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Medium to Rough	Stainless	CBN
GH	RP	MS	
			
(3,4,5,6)	(3)	(3,4)	(3)

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw
	R	L			H	B	LF	LH	HF	WF				
MTGNR/L-123BX	●	●	TNMA TNMG TNMM TNGA TNGG	33○ ★1 ★2	.750	.750	4.500	.937	.750	1.000	ITSN323 ★1	NL34L	CL6	XNS36
MTGNR/L-163CX	●	●		33○ ★1 ★2	1.000	1.000	5.000	.937	1.000	1.250	ITSN323 ★1	NL34L	CL6	XNS36
MTGNR/L-163DX	□	●		33○ ★1 ★2	1.000	1.000	6.000	.937	1.000	1.250	ITSN323 ★1	NL34L	CL9	XNS36
MTGNR/L-164C	●	●		43○ ★1	1.000	1.000	5.000	1.200	1.000	1.250	ITSN432 ★1	NL46	CL9	XNS510
MTGNR/L-164D	●	●		43○ ★1	1.000	1.000	6.000	1.200	1.000	1.250	ITSN432 ★1	NL46	CL9	XNS510
MTGNR/L-165C	□	□		54○ ★1	1.000	1.000	5.000	1.375	1.000	1.250	ITSN533 ★1	NL58	CL9	XNS510
MTGNR/L-165D	□	□		54○ ★1	1.000	1.000	6.000	1.375	1.000	1.250	ITSN533 ★1	NL58	CL9	XNS510
MTGNR/L-204D	□	●		43○ ★1	1.250	1.250	6.000	1.187	1.250	1.500	ITSN432 ★1	NL46	CL9	XNS510
MTGNR/L-205D	●	□		54○ ★1	1.250	1.250	6.000	1.375	1.250	1.500	ITSN533 ★1	NL58	CL9	XNS510
MTGNR/L-244D	□	□		43○ ★1	1.500	1.500	6.000	1.375	1.500	2.000	ITSN432 ★1	NL46	CL9	XNS510
MTGNR/L-244E	□	□		43○ ★1	1.500	1.500	7.000	1.375	1.500	2.000	ITSN432 ★1	NL46	CL9	XNS510
MTGNR/L-245D	□	□		54○ ★1	1.500	1.500	6.000	1.375	1.500	2.000	ITSN533 ★1	NL58	CL9	XNS510
MTGNR/L-245E	□	□		54○ ★1	1.500	1.500	7.000	1.375	1.500	2.000	ITSN533 ★1	NL58	CL9	XNS510
MTGNR/L-246D	□	□		66○ ★1	1.500	1.500	6.000	1.500	1.500	2.000	ITSN636 ★1	NL68L	CL12	XNS510
MTGNR/L-246E	□	□		66○ ★1	1.500	1.500	7.000	1.500	1.500	2.000	ITSN636 ★1	NL68L	CL12	XNS510
MTGNR/L-854D	□	□		43○ ★1	1.250	1.000	6.000	1.200	1.250	1.250	ITSN432 ★1	NL46	CL9	XNS510
MTGNR/L-855D	●			54○ ★1	1.250	1.000	6.000	1.375	1.250	1.250	ITSN533 ★1	NL58	CL9	XNS510

★1 (Opt.) See page M010 for different thickness or radius.
★2 For inserts without hole, remove shim pin and add below.
★3 Clamp Torque (lbf-in) : XNS36=30, XNS510=70

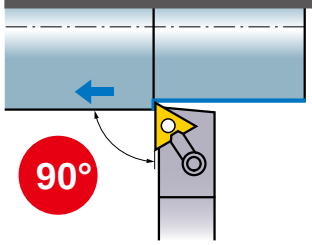
Shim Screw	Chipbreaker
S34	CBT3

EXTERNAL TURNING TOOLS

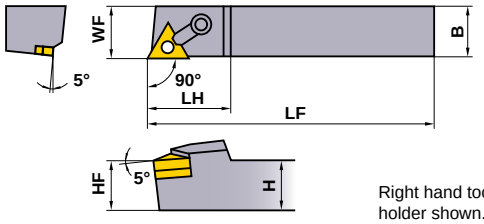
MTGN type inserts	➤ A117–A123
CBN & PCD inserts	➤ B028, B029, B052
CUTTING CONDITIONS	➤ A074
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

TN□□ INSERTS TOOL HOLDERS

MTAN



External turning — ***Multiple Clamp Type*** ***M*** **Holder**



Right hand tool holder shown.

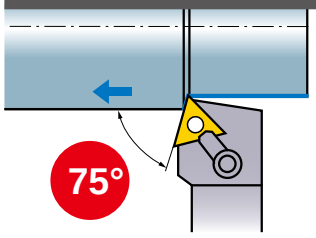
Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Medium to Rough	Stainless	CBN
GH	RP	MS	
			
(3,4,5,6)	(3)	(3,4)	(3)

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw ★3
MTANR/L-102	□		TNMA TNMG TNMM TNGA TNGG	22◌	.625	.625	4.500	.875	.625	.625	—	NL23	CL19	XNS36
MTANR/L-**103X**	●	□		33◌ ★1 ★2	.625	.625	4.500	1.000	.625	.625	ITSN323 ★1	NL34L	CL6	XNS36
MTANR/L-**123X**	●	□		33◌ ★1 ★2	.750	.750	4.500	1.000	.750	.750	ITSN323 ★1	NL34L	CL6	XNS36
MTANR/L-**163X**	●	●		33◌ ★1 ★2	1.000	1.000	6.000	1.000	1.000	1.000	ITSN323 ★1	NL34L	CL6	XNS36
MTANR/L-**164**	●	●		43◌ ★1	1.000	1.000	6.000	1.218	1.000	1.000	ITSN432 ★1	NL46	CL9	XNS59
MTANR/L-**165**	●			54◌ ★1	1.000	1.000	6.000	1.375	1.000	1.000	ITSN533 ★1	NL58	CL9	XNS510
MTANR/L-**204**	●	●		43◌ ★1	1.250	1.250	7.000	1.218	1.250	1.250	ITSN432 ★1	NL46	CL9	XNS59
MTANR/L-**205**	●			54◌ ★1	1.250	1.250	7.000	1.375	1.250	1.250	ITSN533 ★1	NL58	CL9	XNS510
MTANR/L-**246**	□			66◌ ★1	1.500	1.500	7.000	1.484	1.500	1.500	ITSN636 ★1	NL68L	CL12	XNS510
MTANR/L-**864**	□			43◌ ★1	1.500	1.000	7.000	1.218	1.500	1.000	ITSN432 ★1	NL46	CL9	XNS59

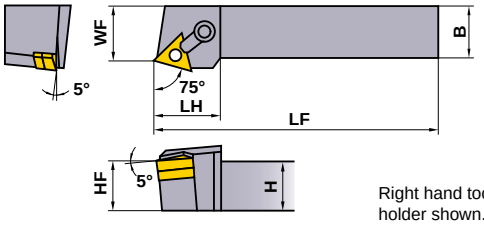
★1 (Opt.) See page M010 for different thickness or radius.
★2 For inserts without hole, remove shim pin and add below.
★3 Clamp Torque (lbf-in) : XNS36=30, XNS59=70, XNS510=70

Shim Screw	Chipbreaker
S34	CBT3

MTRN



External turning — ***Multiple Clamp Type*** ***M*** **Holder**



Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Stainless	CBN	
RP	MS		
			
(3)	(3,4)	(3)	

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw ★3
MTRNR/L-123X	□	□	TNMA TNMG TNMM TNGA TNGG	33◌ ★1 ★2	.750	.750	4.500	1.203	.750	.897	ITSN323 ★1	NL34L	CL20	XNS46
MTRNR/L-**164**	□	□		43◌ ★1	1.000	1.000	6.000	1.250	1.000	1.040	ITSN432 ★1	NL46	CL9	XNS510

★1 (Opt.) See page M010 for different thickness or radius.
★2 For inserts without hole, remove shim pin and add below.
★3 Clamp Torque (lbf-in) : XNS46=45, XNS510=70

Shim Screw	Chipbreaker
S34	CBT3

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

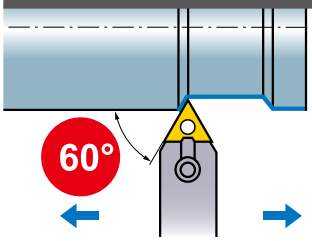
● : Inventory maintained.
□ : Non stock, produced to order only.

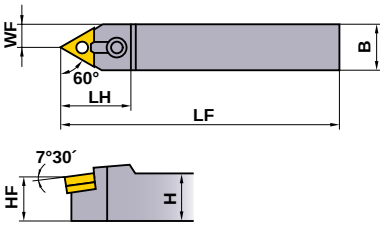
MTAN type inserts	➤ A117–A123	CBN & PCD inserts	➤ B028, B029, B052
MTRN type inserts	➤ A117–A123	CUTTING CONDITIONS	➤ A074

MTEN

External turning
Chamfering

Multiple Clamp Type
***M* Holder**





Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Stainless	CBN	
RP	MS		
			
(3)	(3,4)	(3)	

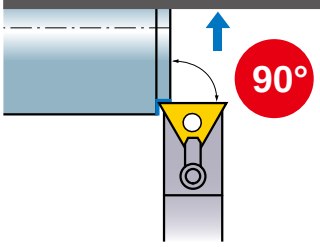
Order Number	Stock	Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw ✶2
				H	B	LF	LH	HF	WF				
MTENN-82	●	TNMA TNMG TNMM TNGA TNGG	22◌	.500	.500	4.500	1.000	.500	.250	—	NL23	CL6	XNS36
MTENN-**103X**	●		33◌ ✶1	.625	.625	4.500	1.156	.625	.313	ITSN323 ✶1	NL34L	CL6	XNS36
MTENN-**123X**	●		33◌ ✶1	.750	.750	4.500	1.156	.750	.375	ITSN323 ✶1	NL34L	CL6	XNS36
MTENN-**164**	●		43◌ ✶1	1.000	1.000	6.000	1.500	1.000	.500	ITSN432 ✶1	NL46	CL9	XNS59
MTENN-**205**	●		54◌ ✶1	1.250	1.250	7.000	1.620	1.250	.625	ITSN533 ✶1	NL58	CL9	XNS510
MTENN-**854**	□		43◌ ✶1	1.250	1.000	6.000	1.500	1.250	.500	ITSN432 ✶1	NL46	CL9	XNS59
MTENN-**864**	●		43◌ ✶1	1.500	1.000	7.000	1.500	1.500	.500	ITSN432 ✶1	NL46	CL9	XNS59
MTENN-**865**	●		54◌ ✶1	1.500	1.000	7.000	1.620	1.500	.500	ITSN533 ✶1	NL58	CL9	XNS510

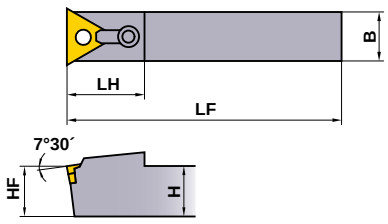
✶1 (Opt.) See page M010 for different thickness or radius.
✶2 Clamp Torque (lbf-in) : XNS36=30, XNS59=70, XNS510=70

MTCN

Facing

Multiple Clamp Type
***M* Holder**





Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Stainless	CBN	
RP	MS		
			
(3)	(3,4)	(3)	

Order Number	Stock	Insert Number		Dimensions (inch)					Shim	Shim Pin	Clamp Bridge	Clamp Screw ✶3
				H	B	LF	LH	HF				
MTCNN-83X	□	TNMA TNMG TNMM TNGA TNGG	33◌ ✶1 ✶2	.500	.500	4.500	1.125	.500	ITSN323 ✶1	NL34L	CL7	XNS36
MTCNN-**124**	□		43◌ ✶1	.750	.750	4.500	1.375	.750	ITSN432 ✶1	NL46	CL12	XNS59
MTCNN-**443X**	□		33◌ ✶1 ✶2	1.000	.500	8.000	1.125	1.000	ITSN323 ✶1	NL34L	CL7	XNS36
MTCNN-**644**	□		43◌ ✶1	1.000	.750	8.000	1.375	1.000	ITSN432 ✶1	NL46	CL12	XNS59
MTCNN-**664**	□		43◌ ✶1	1.500	.750	8.000	1.375	1.500	ITSN432 ✶1	NL46	CL12	XNS59

✶1 (Opt.) See page M010 for different thickness or radius.
✶3 Clamp Torque (lbf-in) : XNS36=30, XNS59=70

✶2 For inserts without hole, remove shim pin and add below.

Shim Screw	S34	Chipbreaker	CBT3

MTEN type inserts	**➤ A117–A123**
MTCN type inserts	**➤ A117–A123**
CBN & PCD inserts	**➤ B028, B029, B052**
CUTTING CONDITIONS	**➤ A074**

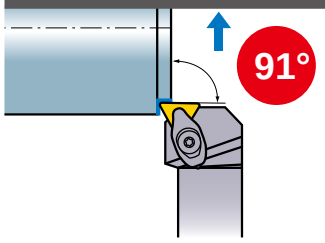
SPARE PARTS	**➤ M001**
TECHNICAL DATA	**➤ N001**

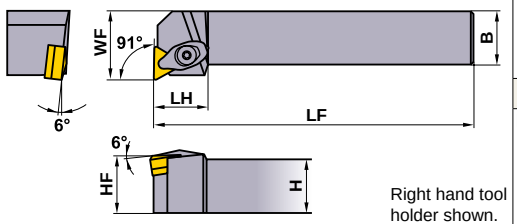
TN□□ INSERTS TOOL HOLDERS

DTFN

DOUBLE CLAMP Type

Facing





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Stainless	CBN	
RP	MS		
			
(3)	(3,4)	(3)	

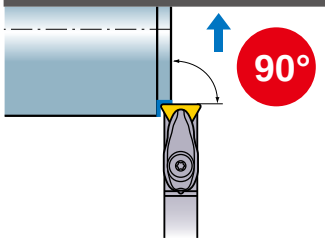
Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *2	Wrench
	R	L			H	B	LF	LH	HF	WF						
DTFNR/L-123	●	●	TNMA TNMG TNMM TNGA TNGG	33□	.750	.750	4.500	1.000	.750	1.000	LLSTN32 *1 (LLSTN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DTFNR/L-163	●	●		33□	1.000	1.000	6.000	1.000	1.000	1.250	LLSTN32 *1 (LLSTN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DTFNR/L-164	●	●		43□	1.000	1.000	6.000	1.219	1.000	1.250	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DTFNR/L-204	●	●		43□	1.250	1.250	6.000	1.219	1.250	1.500	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

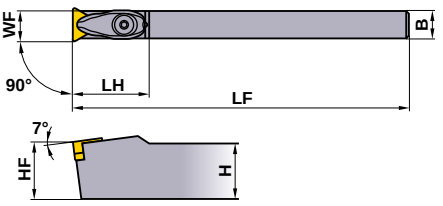
*1 Please use shim no.LLSTN33 with .125inch thick insert. When using .125inch thick inserts, the shim must be ordered separately.
*2 Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

DTCN

DOUBLE CLAMP Type

Facing





Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(3)	(3)	(3)	(3)
Medium to Rough	Stainless	CBN	
RP	MS		
			
(3)	(3)	(3)	

Order Number	Stock	Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *2	Wrench
				H	B	LF	LH	HF	WF						
DTCNN-433	●	TNMA TNMG TNMM TNGA TNGG	33□	.750	.500	4.500	1.375	.750	.539	LLSTN32 *1 (LLSTN33)	LLP23	DCK3113	DCS2	DC0520T	TKY15F
DTCNN-443	●		33□	1.000	.500	6.000	1.375	1.000	.539	LLSTN32 *1 (LLSTN33)	LLP23	DCK3113	DCS2	DC0520T	TKY15F

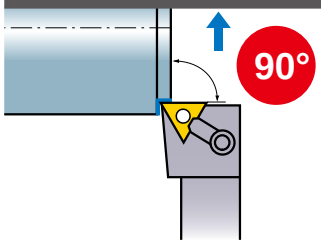
*1 Please use shim no.LLSTN33 with .125inch thick insert. When using .125inch thick inserts, the shim must be ordered separately.
*2 Clamp Torque (lbf-in) : DC0520T=31

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

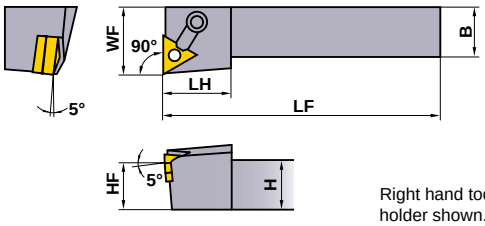
● : Inventory maintained.
□ : Non stock, produced to order only.

DTFN type inserts ➤ A117–A123
DTCN type inserts ➤ A117–A123
CBN & PCD inserts ➤ B028, B029, B052
CUTTING CONDITIONS ➤ A074

MTFN



Facing — ***Multiple Clamp Type*** — ***M*** **Holder**



Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	**Stainless**	**CBN**	
RP	MS		
			
(3)	(3,4)	(3)	

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw ✶3
	R	L			H	B	LF	LH	HF	WF				
MTFNR/L-82	□	□	TNMA TNMG TNMM TNGA TNGG	22◌	.500	.500	4.500	.813	.500	.750	—	NL23	CL19	XNS36
MTFNR/L-103X	□	□		33◌ ✶1 ✶2	.625	.625	4.500	.875	.625	.875	ITSN323 ✶1	NL34L	CL6	XNS36
MTFNR/L-123BX	●	●		33◌ ✶1 ✶2	.750	.750	4.500	.875	.750	1.000	ITSN323 ✶1	NL34L	CL6	XNS36
MTFNR/L-163CX	●	●		33◌ ✶1 ✶2	1.000	1.000	5.000	.875	1.000	1.250	ITSN323 ✶1	NL34L	CL6	XNS36
MTFNR/L-163DX	□	□		33◌ ✶1 ✶2	1.000	1.000	6.000	.875	1.000	1.250	ITSN323 ✶1	NL34L	CL6	XNS36
MTFNR/L-164C	□	□		43◌ ✶1	1.000	1.000	5.000	1.218	1.000	1.250	ITSN432 ✶1	NL46	CL9	XNS510
MTFNR/L-164D	●	●		43◌ ✶1	1.000	1.000	6.000	1.218	1.000	1.250	ITSN432 ✶1	NL46	CL9	XNS510
MTFNR/L-165C		□		54◌ ✶1	1.000	1.000	5.000	1.375	1.000	1.250	ITSN533 ✶1	NL58	CL12	XNS510
MTFNR/L-165D	□	□		54◌ ✶1	1.000	1.000	6.000	1.375	1.000	1.250	ITSN533 ✶1	NL58	CL12	XNS510
MTFNR/L-204D	□	□		43◌ ✶1	1.250	1.250	6.000	1.218	1.250	1.500	ITSN432 ✶1	NL46	CL9	XNS510
MTFNR/L-205D	●	□		54◌ ✶1	1.250	1.250	6.000	1.375	1.250	1.500	ITSN533 ✶1	NL58	CL12	XNS510
MTFNR/L-246D	□	□		66◌ ✶1	1.500	1.500	6.000	1.500	1.500	2.000	ITSN636 ✶1	NL68	CL12	XNS510
MTFNR/L-246E	□	□		66◌ ✶1	1.500	1.500	7.000	1.500	1.500	2.000	ITSN636 ✶1	NL68	CL12	XNS510
MTFNR/L-855D	□	□		54◌ ✶1	1.250	1.000	6.000	1.375	1.250	1.250	ITSN533 ✶1	NL58	CL12	XNS510

✶1 (Opt.) See page M010 for different thickness or radius.
✶2 For inserts without hole, remove shim pin and add below.
✶3 Clamp Torque (lbf-in) : XNS36=30, XNS510=70

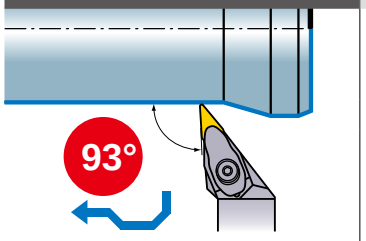
Shim Screw	Chipbreaker
S34	CBT3

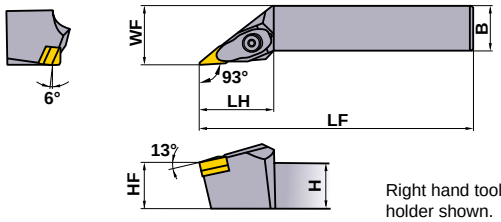
MTFN type inserts	➤ A117–A123
CBN & PCD inserts	➤ B028, B029, B052
CUTTING CONDITIONS	➤ A074
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

VNOO INSERTS TOOL HOLDERS

DVJN

External turning Copying ***DOUBLE CLAMP Type***





Right hand tool holder shown.

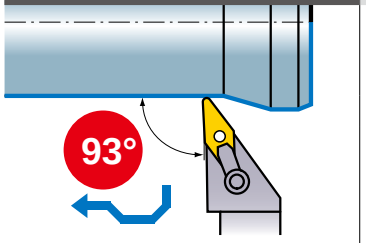
Finish	Light	Medium	Medium
FH	LP	MA	MK
			
(3)	(3)	(3)	(3)
Medium	**Stainless**	**G Class**	**CBN**
MP	MS	MJ	
			
(3)	(3)	(3)	(3)

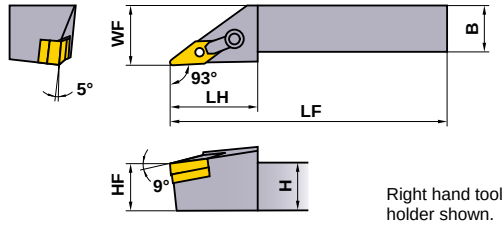
Order Number	Stock		Insert Number		Dimensions (inch)										 *	
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
DVJNR/L-123	●	●	VNGA VNMG	33◌	.750	.750	4.500	1.625	.750	1.000	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
DVJNR/L**-163**	●	●	VNGM	33◌	1.000	1.000	6.000	1.625	1.000	1.250	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
DVJNR/L**-203**	●	●	VNGG VNMM	33◌	1.250	1.250	6.000	1.625	1.250	1.500	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F

* Clamp Torque (lbf-in) : DC0520T=31

MVJN

External turning Copying ***Multiple Clamp Type*** ***M* Holder**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MA	MK
			
(3)	(3)	(3)	(3)
Medium	**Stainless**	**G Class**	**CBN**
MP	MS	MJ	
			
(3)	(3)	(3)	(3)

Order Number	Stock		Insert Number		Dimensions (inch)									 *2
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw
MVJNR/L-123B	●	●	VNGA VNMG VNGM VNGG VNMM	33◌	.750	.750	4.500	1.687	.750	1.000	IVSN322	NL34L	CL30	XNS510
MVJNR/L**-163C**	●	●		33◌	1.000	1.000	5.000	1.687	1.000	1.250	IVSN322	NL34L	CL30	XNS510
MVJNR/L**-163D**	●	●		33◌	1.000	1.000	6.000	1.687	1.000	1.250	IVSN322	NL34L	CL30	XNS510
MVJNR/L**-164C**	□	□		43◌	1.000	1.000	5.000	2.000	1.000	1.250	IVSN432 *1	NL46	CL30	XNS510
MVJNR/L**-164D**	●	●		43◌	1.000	1.000	6.000	2.000	1.000	1.250	IVSN432 *1	NL46	CL30	XNS510
MVJNR/L**-203D**	□	□		33◌	1.250	1.250	6.000	1.687	1.250	1.500	IVSN322	NL34L	CL30	XNS510
MVJNR/L**-204D**	□	□		43◌	1.250	1.250	6.000	2.000	1.250	1.500	IVSN432 *1	NL46	CL30	XNS510

*1 (Opt.) See page M010 for different radius.
*2 Clamp Torque (lbf-in) : XNS510=70

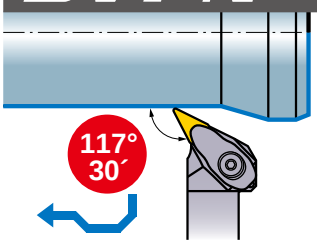
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

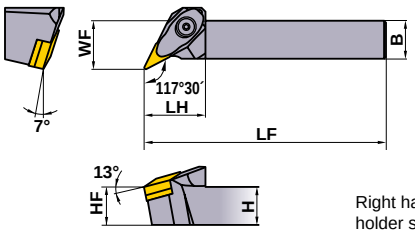
● : **Inventory maintained.**
□ : **Non stock, produced to order only.**

DVJN type inserts	**➤ A124–A127**
MVJN type inserts	**➤ A124–A127**
CBN & PCD inserts	**➤ B030, B031, B053**
CUTTING CONDITIONS	**➤ A074**

DVPN

Facing Copying — ***DOUBLE CLAMP Type***





Right hand tool holder shown.

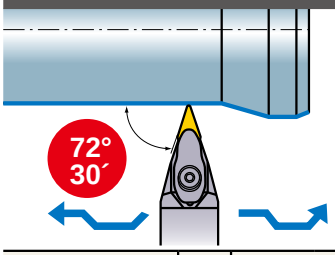
Finish	Light	Medium	Medium
FH	LP	MA	MK
			
(3)	(3)	(3)	(3)
Medium	**Stainless**	**G Class**	**CBN**
MP	MS	MJ	
			
(3)	(3)	(3)	(3)

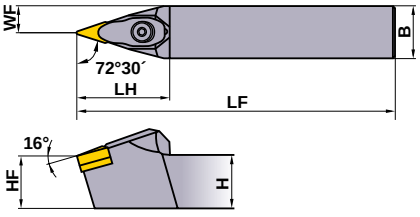
Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
	R	L			H	B	LF	LH	HF	WF						
DVPNR/L-123	●	●	VNGA VNMG VNGM VNGG VNMM	33○	.750	.750	4.500	1.250	.750	1.000	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
DVPNR/L**-163**	●	●		33○	1.000	1.000	6.000	1.250	1.000	1.250	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F

* Clamp Torque (lbf-in) : DC0520T=31

DVVN

External turning Copying — ***DOUBLE CLAMP Type***





Finish	Light	Medium	Medium
FH	LP	MA	MK
			
(3)	(3)	(3)	(3)
Medium	**Stainless**	**G Class**	**CBN**
MP	MS	MJ	
			
(3)	(3)	(3)	(3)

Order Number	Stock	Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
				H	B	LF	LH	HF	WF						
DVVNN-123	●	VNGA VNMG VNGM VNGG VNMM	33○	.750	.750	4.500	1.750	.750	.375	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
DVVNN**-163**	●		33○	1.000	1.000	6.000	1.750	1.000	.500	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F

* Clamp Torque (lbf-in) : DC0520T=31

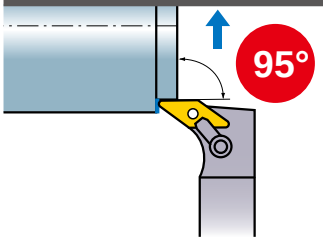
DVPN type inserts	➤ A124–A127	CUTTING CONDITIONS	➤ A074
DVVN type inserts	➤ A124–A127	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B030, B031, B053	TECHNICAL DATA	➤ N001

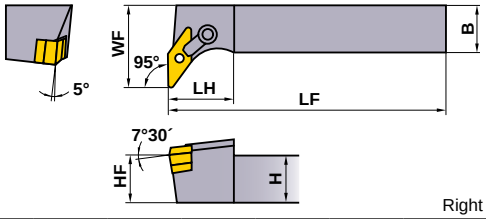
VN INSERTS TOOL HOLDERS

MVLN

Facing — ***Multiple Clamp Type*** — ***M*** **Holder**

Medium
MJ





(4)

Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)									
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw ✶2
MVLNR/L-164C	●	●	VNGA VNMG VNGM	43◌	1.000	1.000	5.000	1.500	1.000	1.750	IVSN432 ✶1	NL46	CL12	XNS510
MVLNR/L-164D	●	●		43◌	1.000	1.000	6.000	1.500	1.000	1.750	IVSN432 ✶1	NL46	CL12	XNS510
MVLNR/L-204D	●	●		43◌	1.250	1.250	6.000	1.500	1.250	2.000	IVSN432 ✶1	NL46	CL12	XNS510
MVLNR/L-244D	□			43◌	1.500	1.500	6.000	1.500	1.500	2.250	IVSN432 ✶1	NL46	CL12	XNS510

✶1 (Opt.) See page M010 for different radius.
✶2 Clamp Torque (lbf-in) : XNS510=70

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

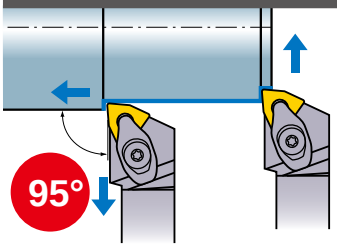
● : Inventory maintained. □ : Non stock, produced to order only.

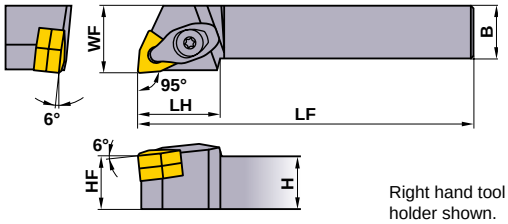
MVLN type inserts ➤ A125
CUTTING CONDITIONS ➤ A074

WN INSERTS TOOL HOLDERS

DWLN

External turning Facing ***DOUBLE CLAMP Type***





Right hand tool holder shown.

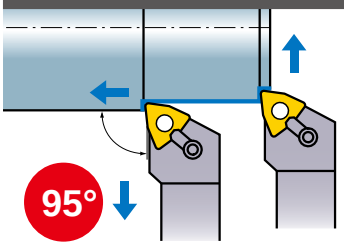
Finish	Light	Medium	Medium
FH	LP	MP	MK
			
(4)	(4)	(3,4)	(4)
Medium	**Medium to Rough**	**Stainless**	
Standard	RP	MS	
			
(4)	(4)	(3,4)	

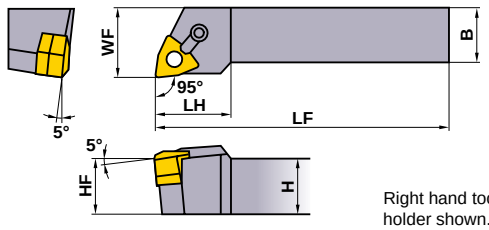
Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw ★2	Wrench
	R	L			H	B	LF	LH	HF	WF						
DWLNR/L-123	●	●	WNMA WNMG	33◌	.750	.750	4.500	1.000	.750	1.000	LLSWN32 (LLSWN33) ★1	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DWLNR/L-124	●	●		43◌	.750	.750	4.500	1.250	.750	1.000	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DWLNR/L-163	●	●		33◌	1.000	1.000	6.000	1.000	1.000	1.250	LLSWN32 (LLSWN33) ★1	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DWLNR/L-164	●	●		43◌	1.000	1.000	6.000	1.250	1.000	1.250	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DWLNR/L-204	●	●		43◌	1.250	1.250	6.000	1.250	1.250	1.500	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

★1 Please use shim no.LLSWN33 with .125inch thick insert. When using .125inch thick inserts, the shim must be ordered separately.
★2 Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

MWLN

External turning Facing ***Multiple Clamp Type*** ***M* Holder**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	SA	MA	MK
			
(4)	(4)	(3,4)	(4)
Medium	**Medium to Rough**	**Stainless**	
Standard	RP	MS	
			
(4)	(4)	(3,4)	

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw ★
	R	L			H	B	LF	LH	HF	WF				
MWLNR/L-1232	●	●	WNMA WNMG	32◌	.750	.750	4.500	1.000	.750	1.000	IWSN322	NL34L	CL7	XNS36
MWLNR/L-1233	●	●		33◌	.750	.750	4.500	1.000	.750	1.000	IWSN322	NL34L	CL7	XNS36
MWLNR/L-124B	●	●		43◌	.750	.750	4.500	1.000	.750	1.000	IWSN432	NL46	CL20	XNS48
MWLNR/L-1632	●	●		32◌	1.000	1.000	6.000	1.188	1.000	1.250	IWSN322	NL34	CL7	XNS36
MWLNR/L-1633	●	●		33◌	1.000	1.000	6.000	1.188	1.000	1.250	IWSN322	NL34L	CL7	XNS36
MWLNR/L-164D	●	●		43◌	1.000	1.000	6.000	1.188	1.000	1.250	IWSN432	NL46	CL20	XNS48
MWLNR/L-854D	●	●		43◌	1.250	1.000	6.000	1.188	1.250	1.250	IWSN432	NL46	CL20	XNS48
MWLNR/L-204D	●	●		43◌	1.250	1.250	6.000	1.188	1.250	1.500	IWSN432	NL46	CL20	XNS48
MWLNR/L-165D	●	●		54◌	1.000	1.000	6.000	1.188	1.000	1.250	IWSN533	NL34L	CL9	XNS59
MWLNR/L-205D	●	●		54◌	1.250	1.250	6.000	1.125	1.250	1.500	IWSN533	NL34L	CL9	XNS59
MWLNR/L-245E	●	●		54◌	1.500	1.500	7.000	1.125	1.500	2.000	IWSN533	NL58	CL9	XNS59

★ Clamp Torque (lbf-in) : XNS36=30, XNS48=45, XNS59=70

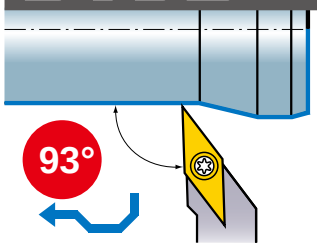
DWLN type inserts	➤ A128–A132	CUTTING CONDITIONS	➤ A074
MWLN type inserts	➤ A128–A132	SPARE PARTS	➤ M001
CBN inserts	➤ B032	TECHNICAL DATA	➤ N001

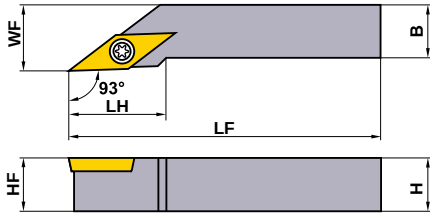
VB INSERTS TOOL HOLDERS

SVJB

External turning
Copying

Screw Clamp Type
***SP* Holder**





Right hand tool holder shown.

Finish	Finish
FV	FP
	
(2)	(3)
Medium	Medium
MV	MP
	
(2)	(3)

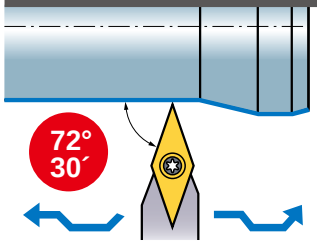
Order Number	Stock		Insert Number		Dimensions (inch)						*	
	R	L			H	B	LF	LH	HF	WF	Clamp Screw	Wrench
SVJBR/L-062	●	●	VBGT VBMT VBET	22◌	.375	.375	2.500	.875	.375	.500	TS25	TKY08F
SVJBR/L-082	●	●		22◌	.500	.500	3.500	.875	.500	.625	TS25	TKY08F
SVJBR/L-102	●	●		22◌	.625	.625	4.000	.875	.625	.750	TS25	TKY08F
SVJBR/L-123	●	●		33◌	.750	.750	4.500	1.250	.750	1.000	TS4	TKY15F
SVJBR/L-163	●	●		33◌	1.000	1.000	6.000	1.250	1.000	1.250	TS4	TKY15F

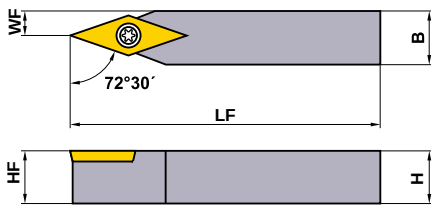
* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

SVVB

External turning
Copying

Screw Clamp Type
***SP* Holder**





Finish	Finish
FV	FP
	
(2)	(3)
Medium	Medium
MV	MP
	
(2)	(3)

Order Number	Stock		Insert Number		Dimensions (inch)					*	
					H	B	LF	HF	WF	Clamp Screw	Wrench
SVVBN-062	●		VBGT VBMT VBET	22◌	.375	.375	2.500	.375	.188	TS25	TKY08F
SVVBN-082	●			22◌	.500	.500	3.000	.500	.250	TS25	TKY08F
SVVBN-102	●			22◌	.625	.625	4.000	.625	.313	TS25	TKY08F
SVVBN-122	●			22◌	.750	.750	4.500	.750	.375	TS25	TKY08F
SVVBN-123	●			33◌	.750	.750	4.500	.750	.375	TS4	TKY15F
SVVBN-163	●			33◌	1.000	1.000	6.000	1.000	.500	TS4	TKY15F

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

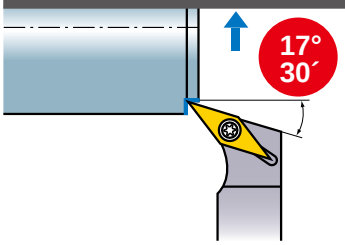
SVJB type inserts	**➤ A162–A165**	**CBN & PCD inserts**	**➤ B044, B060**
SVVB type inserts	**➤ A162–A165**	**CUTTING CONDITIONS**	**➤ A074**

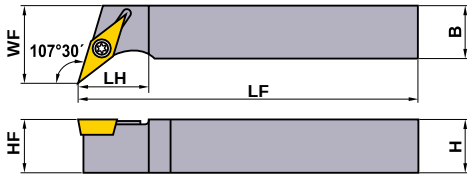
● : Inventory maintained.

SVHB

Facing

Screw Clamp Type
***SP* Holder**





Right hand tool holder shown.

Finish	Finish
FV  (2)	FP  (3)
Medium	Medium
MV  (2)	MP  (3)

Order Number	Stock		Insert Number		Dimensions (inch)						*	
	R	L			H	B	LF	LH	HF	WF	Clamp Screw	Wrench
SVHBR/L-062	●	●	VBGT VBMT VBET	22◌	.375	.375	2.500	.600	.375	.500	TS25	TKY08F
SVHBR/L**-082**	●	●		22◌	.500	.500	3.500	.600	.500	.625	TS25	TKY08F
SVHBR/L**-102**	●	●		22◌	.625	.625	4.000	.600	.625	.750	TS25	TKY08F
SVHBR/L**-123**	●	●		33◌	.750	.750	4.500	1.000	.750	1.000	TS4	TKY15F
SVHBR/L**-163**	●	●		33◌	1.000	1.000	6.000	1.000	1.000	1.250	TS4	TKY15F

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

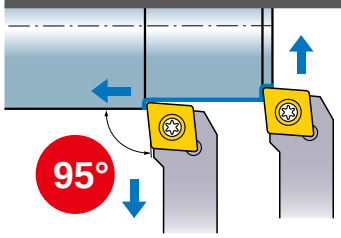
SVHB type inserts	➤ A162–A165
CBN & PCD inserts	➤ B044, B060
CUTTING CONDITIONS	➤ A074
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

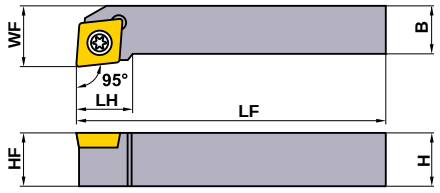
CC○○ INSERTS TOOL HOLDERS

SCLC

External turning
Facing

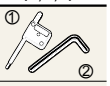
Screw Clamp Type
***SP* Holder**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP  (2,3)	FM  (2,3)	LP  (2,3)	LM  (2,3)
Medium	**Medium**	**Flat Top**	**PCD/CBN**
MP  (2,3,4)	MM  (2,3,4)	 (2,3,4)	 (2,3,4)

Order Number	Stock		Insert Number		Dimensions (inch)								 *	
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Screw	Clamp Screw	Wrench
SCLCR/L-062	●	●	CCET CCGT CCMT CCMW CCGW CCMH	21.5○	.375	.375	2.500	.350	.375	.500	—	—	TS25	①TKY08F
SCLCR/L**-083**	●	●		32.5○	.500	.500	3.500	.540	.500	.625	—	—	TS43	①TKY15F
SCLCR/L**-104**	●	●		43○	.625	.625	4.000	.660	.625	.750	—	—	TS5	①TKY25F
SCLCR/L**-124**	●	●		43○	.750	.750	4.500	.660	.750	.875	SPSCN42	JSS7	TS53	②TKY25R
SCLCR/L**-164**	●	●		43○	1.000	1.000	6.000	1.000	1.000	1.250	SPSCN42	JSS7	TS53	②TKY25R

* Clamp Torque (lbf-in) : TS25=8.9, TS43=31, TS5=66, TS53=66

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

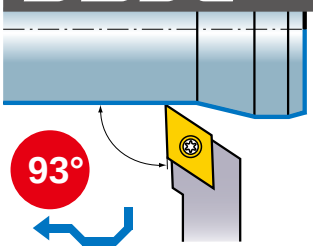
SCLC type inserts	**➤ A136–A141**
CBN & PCD inserts	**➤ B036, B037, B055**
CUTTING CONDITIONS	**➤ A074**

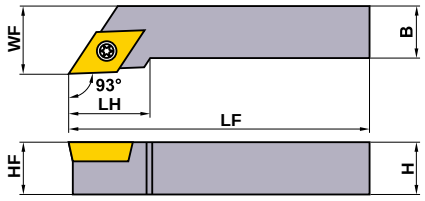
● : **Inventory maintained.**

SDJC

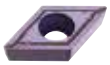
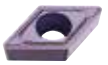
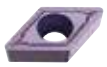
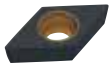
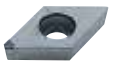
External turning
Copying

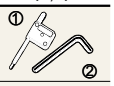
Screw Clamp Type
***SP* Holder**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	Medium	Flat Top	PCD/CBN
MP	MM		
			
(2,3)	(2,3)	(2,3)	(2,3)

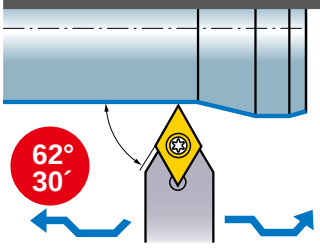
Order Number	Stock		Insert Number		Dimensions (inch)								 *	
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Screw	Clamp Screw	Wrench
SDJCR/L-062	●	●	DCET DCGT DCMT DCMW	21.5○	.375	.375	2.500	.500	.375	.500	—	—	TS25	①TKY08F
SDJCR/L-083	●	●		32.5○	.500	.500	3.500	.700	.500	.625	—	—	TS43	①TKY15F
SDJCR/L-103	●	●		32.5○	.625	.625	4.000	.700	.625	.750	—	—	TS43	①TKY15F
SDJCR/L-123	●	●		32.5○	.750	.750	4.500	.700	.750	.875	SPSDN32	JSS6	TS406	②TKY15R
SDJCR/L-163	●	●		32.5○	1.000	1.000	6.000	1.000	1.000	1.250	SPSDN32	JSS6	TS406	②TKY15R

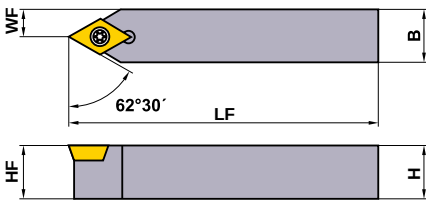
* Clamp Torque (lbf-in) : TS25=8.9, TS43=31, TS406=31

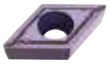
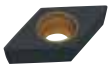
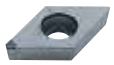
SDNC

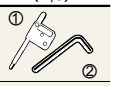
External turning
Copying

Screw Clamp Type
***SP* Holder**





Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	Medium	Flat Top	PCD/CBN
MP	MM		
			
(2,3)	(2,3)	(2,3)	(2,3)

Order Number	Stock	Insert Number		Dimensions (inch)							 *	
				H	B	LF	HF	WF	Shim	Shim Screw	Clamp Screw	Wrench
SDNCN-062	●	DCET DCGT DCMT DCMW	21.5○	.375	.375	2.500	.375	.188	—	—	TS25	①TKY08F
SDNCN-083	●		32.5○	.500	.500	3.500	.500	.250	—	—	TS43	①TKY15F
SDNCN-103	●		32.5○	.625	.625	4.000	.625	.313	—	—	TS43	①TKY15F
SDNCN-123	●		32.5○	.750	.750	4.500	.750	.375	SPSDN32	JSS6	TS406	②TKY15R
SDNCN-163	●		32.5○	1.000	1.000	6.000	1.000	.500	SPSDN32	JSS6	TS406	②TKY15R

* Clamp Torque (lbf-in) : TS25=8.9, TS43=31, TS406=31

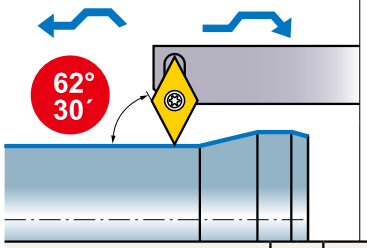
SDJC type inserts	➤ A144–A149	CUTTING CONDITIONS	➤ A074
SDNC type inserts	➤ A144–A149	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B039, B040, B056	TECHNICAL DATA	➤ N001

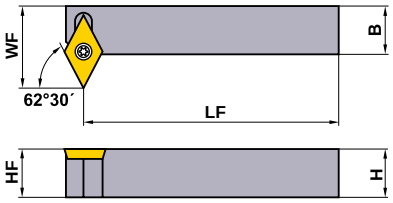
DC○○ INSERTS TOOL HOLDERS

SDXC

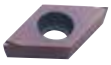
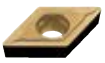
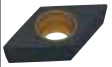
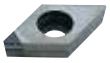
External turning
Copying

Screw Clamp Type
***SP* Holder**





Right hand tool holder shown.

Finish	Finish	Light	Medium
FV	R/L-F	SV	MV
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Flat Top**	**CBN/PCD**	
Standard			
			
(2,3)	(2,3)	(2,3)	

Order Number	Stock		Insert Number		Dimensions (inch)					*	
	R	L			H	B	LF	HF	WF	Clamp Screw	Wrench
SDXCR/L-062	●	●	DCET DCGT DCMT	21.5○	.375	.375	2.500	.375	.625	TS25	TKY08F
SDXCR/L-082	●	●		21.5○	.500	.500	3.500	.500	.750	TS25	TKY08F
SDXCR/L-103	●	●	DCMW	32.5○	.625	.625	4.000	.625	1.000	TS43	TKY15F

* Clamp Torque (lbf-in) : TS25=8.9, TS43=31

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

SDXC type inserts	**➤ A144–A149**
CBN & PCD inserts	**➤ B039, B040, B056**
CUTTING CONDITIONS	**➤ A074**

● : **Inventory maintained.**

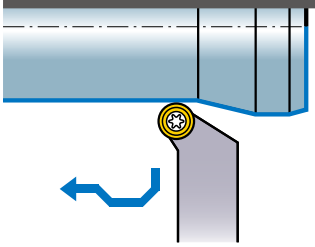
SRGC

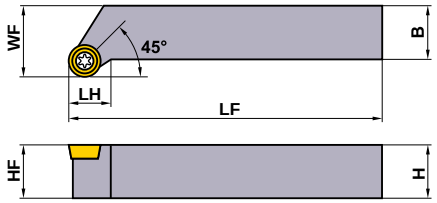
External turning
Copying

Screw Clamp Type
***SP* Holder**

Medium
Standard


(08)





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)						* Clamp Screw	Wrench
	R	L			H	B	LF	LH	HF	WF		
SRGCR/L-0608M	●	●	RCMT	0803M0	.375	.375	2.500	.610	.375	.625	TS3	TKY08F
SRGCR/L**-0808M**	●	●		0803M0	.500	.500	3.500	.610	.500	.750	TS3	TKY08F
SRGCR/L**-1008M**	●	●		0803M0	.625	.625	4.000	.610	.625	.875	TS3	TKY08F

* Clamp Torque (lbf-in) : TS3=8.9

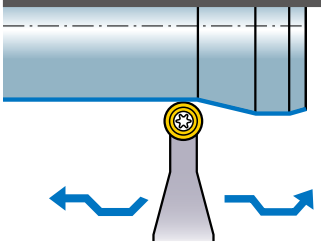
SRDC

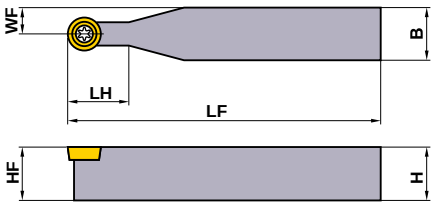
External turning
Copying

Screw Clamp Type
***SP* Holder**

Medium
Standard


(08)





Order Number	Stock		Insert Number		Dimensions (inch)						* Clamp Screw	Wrench
					H	B	LF	LH	HF	WF		
SRDCN-0608M	●		RCMT	0803M0	.375	.375	2.500	.375	.375	.188	TS3	TKY08F
SRDCN**-0808M**	●			0803M0	.500	.500	3.500	.500	.500	.250	TS3	TKY08F
SRDCN**-1008M**	●			0803M0	.625	.625	4.000	.500	.625	.313	TS3	TKY08F

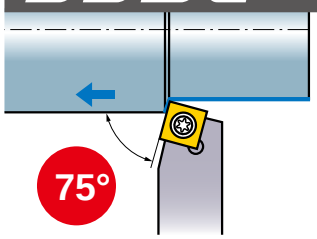
* Clamp Torque (lbf-in) : TS3=8.9

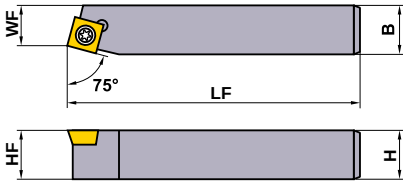
SRGC type inserts	➤ **A151**
SRDC type inserts	➤ **A151**
CUTTING CONDITIONS	➤ **A074**
SPARE PARTS	➤ **M001**
TECHNICAL DATA	➤ **N001**

SC INSERTS TOOL HOLDERS

SSBC

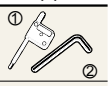
External turning — ***Screw Clamp Type*** **SP Holder**





Right hand tool holder shown.

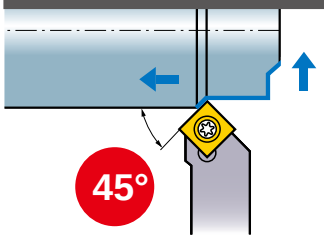
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(3)	(3)	(3)	(3)
Medium	**Medium**	**Medium**	**Flat Top**
MP	MM	Standard	
			
(3,4)	(3,4)	(3)	(3)

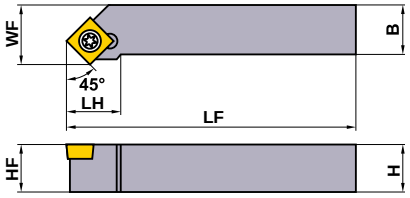
Order Number	Stock		Insert Number		Dimensions (inch)							 *	 ① ②
	R	L			H	B	LF	HF	WF	Shim	Shim Screw	Clamp Screw	Wrench
SSBCR/L-103	●	●	SCMT SCMW	32.5	.625	.625	4.000	.625	.500	—	—	TS43	①TKY15F
SSBCR/L-124	●	●		43	.750	.750	4.500	.750	.625	SPSSN42	JSS7	TS53	②TKY25R
SSBCR/L-164	●	●		43	1.000	1.000	6.000	1.000	.875	SPSSN42	JSS7	TS53	②TKY25R

* Clamp Torque (lbf-in) : TS43=31, TS53=66

SSSC

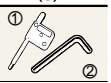
External turning
Facing, Chamfering — ***Screw Clamp Type*** **SP Holder**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(3)	(3)	(3)	(3)
Medium	**Medium**	**Medium**	**Flat Top**
MP	MM	Standard	
			
(3,4)	(3,4)	(3)	(3)

Order Number	Stock		Insert Number		Dimensions (inch)								 *	 ① ②
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Screw	Clamp Screw	Wrench
SSSCR/L-083	●	●	SCMT SCMW	32.5	.500	.500	3.500	.625	.500	.550	—	—	TS43	①TKY15F
SSSCR/L-103	●	●		32.5	.625	.625	4.000	.625	.625	.680	—	—	TS43	①TKY15F
SSSCR/L-124	●	●		43	.750	.750	4.500	1.000	.750	.850	SPSSN42	JSS7	TS53	②TKY25R
SSSCR/L-164	●	●		43	1.000	1.000	6.000	1.000	1.000	1.110	SPSSN42	JSS7	TS53	②TKY25R

* Clamp Torque (lbf-in) : TS43=31, TS53=66

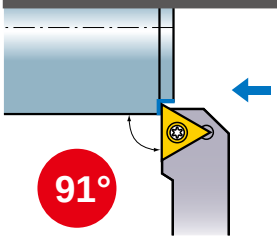
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

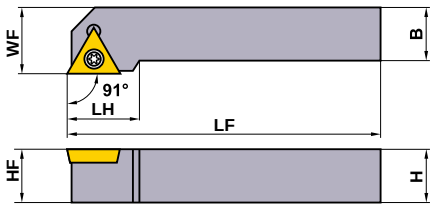
SSBC type inserts	**➤ A152, A153**
SSSC type inserts	**➤ A152, A153**
CUTTING CONDITIONS	**➤ A074**

● : **Inventory maintained.**

STGC

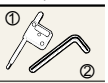
External turning — ***Screw Clamp Type*** **SP Holder**





Right hand tool holder shown.

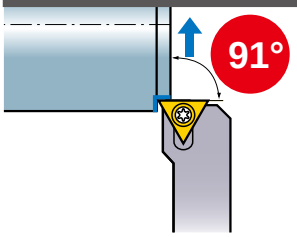
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Flat Top**	**PCD/CBN**
MP	MM		
			
(2,3)	(2,3)	(2,3)	(2,3)

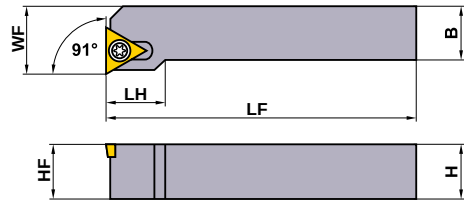
Order Number	Stock		Insert Number		Dimensions (inch)						 Shim	 Shim Screw	 * Clamp Screw	 Wrench
	R	L			H	B	LF	LH	HF	WF				
STGCR/L-062	●	●	TCGT TCMT TCMW	21.5°	.375	.375	2.500	.550	.375	.500	—	—	TS25	①TKY08F
STGCR/L-082.5	●	●		2.52°	.500	.500	3.500	.700	.500	.625	—	—	TS3	①TKY08F
STGCR/L-103	●	●		32.5°	.625	.625	4.000	.800	.625	.750	—	—	TS43	①TKY15F
STGCR/L-123	●	●		32.5°	.750	.750	4.500	.800	.750	.875	SPSTN32	JSS6	TS406	②TKY15R
STGCR/L-163	●	●		32.5°	1.000	1.000	6.000	.900	1.000	1.250	SPSTN32	JSS6	TS406	②TKY15R

* Clamp Torque (lbf-in) : TS25=8.9, TS3=8.9, TS43=31, TS406=31

STFC

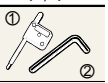
Facing — ***Screw Clamp Type*** **SP Holder**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Flat Top**	**PCD/CBN**
MP	MM		
			
(2,3)	(2,3)	(2,3)	(2,3)

Order Number	Stock		Insert Number		Dimensions (inch)						 Shim	 Shim Screw	 * Clamp Screw	 Wrench
	R	L			H	B	LF	LH	HF	WF				
STFCR/L-062	●	●	TCGT TCMT TCMW	21.5°	.375	.375	2.500	.500	.375	.500	—	—	TS25	①TKY08F
STFCR/L-082.5	●	●		2.52°	.500	.500	3.500	.571	.500	.625	—	—	TS3	①TKY08F
STFCR/L-102.5	●	●		2.52°	.625	.625	4.000	.571	.625	.750	—	—	TS3	①TKY08F
STFCR/L-123	●	●		32.5°	.750	.750	4.500	.866	.750	.875	SPSTN32	JSS6	TS406	②TKY15R
STFCR/L-163	●	●		32.5°	1.000	1.000	6.000	.866	1.000	1.250	SPSTN32	JSS6	TS406	②TKY15R

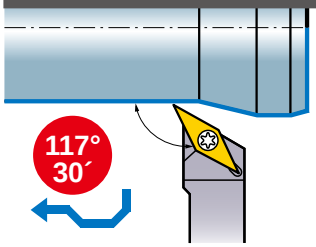
* Clamp Torque (lbf-in) : TS25=8.9, TS3=8.9, TS406=31

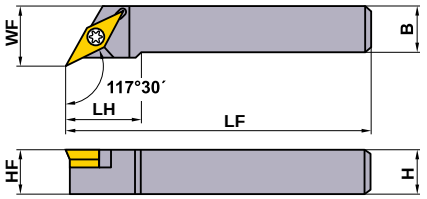
STGC type inserts	➤ A155—A157	CUTTING CONDITIONS	➤ A074
STFC type inserts	➤ A155—A157	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B041, B057	TECHNICAL DATA	➤ N001

VC INSERTS TOOL HOLDERS

SVPC

External turning Copying — ***Screw Clamp Type*** **SP Holder**





Right hand tool holder shown.

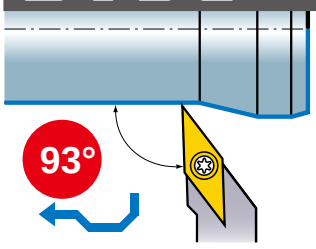
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Medium**	**Flat Top**
MP	MM	Standard	
			
(2,3)	(2,3)	(2,3)	(2,3)

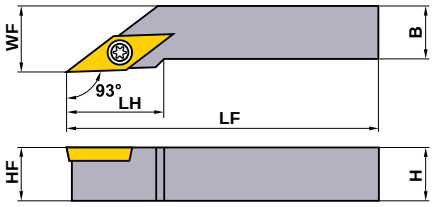
Order Number	Stock		Insert Number		Dimensions (inch)						 Shim	 Shim Pin	 * Clamp Screw	 Wrench
	R	L			H	B	LF	LH	HF	WF				
SVPCR/L-082	●	●	VCMT VCGT VCMW NP-VCGW	22◌	.500	.500	3.500	1.000	.500	.750	—	—	TS25	①TKY08F
SVPCR/L**-102**	●	●		22◌	.625	.625	4.000	1.000	.625	.875	—	—	TS25	①TKY08F
SVPCR/L**-123**	●	●		33◌	.750	.750	4.500	1.206	.750	1.000	SPSVN32	BCP141	TS44	②TKY15R
SVPCR/L**-163**	●	●		33◌	1.000	1.000	6.000	1.206	1.000	1.250	SPSVN32	BCP141	TS44	②TKY15R

* Clamp Torque (lbf-in) : TS25=8.9, TS44=31

SVJC

External turning Copying — ***Screw Clamp Type*** **SP Holder**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Medium**	**Flat Top**
MP	MM	Standard	
			
(3)	(3)	(2,3)	(2,3)

Order Number	Stock		Insert Number		Dimensions (inch)						 Shim	 Shim Pin	 * Clamp Screw	 Wrench
	R	L			H	B	LF	LH	HF	WF				
SVJCR/L-062	●	●	VCMT VCGT VCMW NP-VCGW	22◌	.375	.375	2.500	.750	.375	.500	—	—	TS25	①TKY08F
SVJCR/L**-083**	●	●		33◌	.500	.500	3.500	1.000	.500	.625	—	—	TS43	①TKY15F
SVJCR/L**-103**	●	●		33◌	.625	.625	4.000	1.000	.625	.750	—	—	TS43	①TKY15F
SVJCR/L**-123**	●	●		33◌	.750	.750	4.500	1.000	.750	.875	SPSVN32	BCP141	TS44	②TKY15R
SVJCR/L**-163**	●	●		33◌	1.000	1.000	6.000	1.500	1.000	1.250	SPSVN32	BCP141	TS44	②TKY15R

* Clamp Torque (lbf-in) : TS25=8.9, TS43=31, TS44=31

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

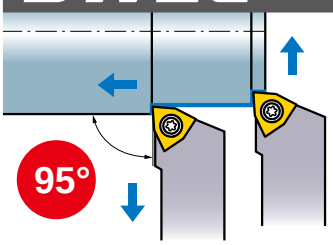
SVPC type inserts	**➤ A166, A167**
SVJC type inserts	**➤ A166, A167**
CBN & PCD inserts	**➤ B045, B060**
CUTTING CONDITIONS	**➤ A074**

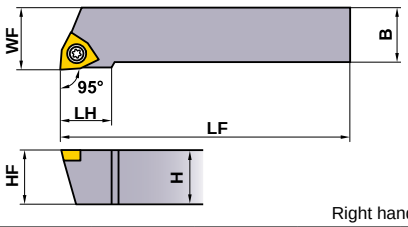
● : Inventory maintained.

SWLC

External turning
Facing

Screw Clamp Type
***SP* Holder**





Right hand tool holder shown.

Finish	Medium
FJ  (2,3)	MJ  (2,3)
Medium	
Standard  (2,3)	

Order Number	Stock		Insert Number		Dimensions (inch)						*	
	R	L			H	B	LF	LH	HF	WF	Clamp Screw	Wrench
SWLCR/L-052	●	●	WCGT WCMT	21.5○	.313	.313	2.500	.500	.313	.375	TS25	TKY08F
SWLCR/L**-062**	●	●		21.5○	.375	.375	2.500	.500	.375	.500	TS25	TKY08F
SWLCR/L**-082**	●	●		21.5○	.500	.500	3.500	.500	.500	.625	TS25	TKY08F
SWLCR/L**-103**	●	●		32.5○	.625	.625	4.000	.625	.625	.750	TS4	TKY15F
SWLCR/L**-123**	●	●		32.5○	.750	.750	4.500	.625	.750	1.000	TS4	TKY15F

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

SWLC type inserts	➤ A171	SPARE PARTS	➤ M001
CBN inserts	➤ B046	TECHNICAL DATA	➤ N001
CUTTING CONDITIONS	➤ A074		

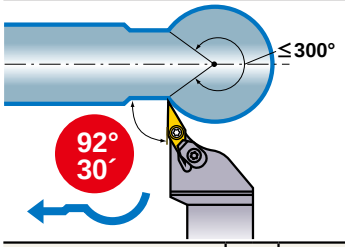
XC□□ INSERTS TOOL HOLDERS

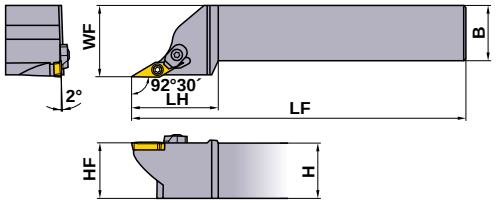
SXZC

External turning
Copying

DOUBLE CLAMP Type

Finish: SVX





Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Clamp Screw *	Clamp Bridge	Clamp Bridge Screw *	Spring	Wrench (Insert)	Wrench (Clamp Bridge)
SXZCR/L-102	●	●	XCMT	22□SVX	.625	.625	4.000	1.378	.625	.750	TS255	AMS3	AJS3010T10	ASS2	TKY08F	TKY10F
SXZCR/L**-122**	●	●		22□SVX	.750	.750	4.500	1.378	.750	1.000	TS255	AMS3	AJS3010T10	ASS2	TKY08F	TKY10F
SXZCR/L**-162**	●	●		22□SVX	1.000	1.000	6.000	1.575	1.000	1.250	TS255	AMS3	AJS3010T10	ASS2	TKY08F	TKY10F

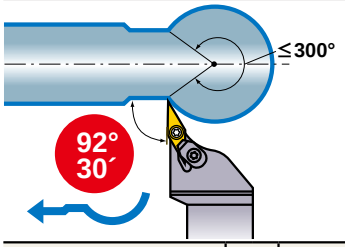
∗ Clamp Torque (lbf-in) : TS255=8.9, AJS3010T10=22

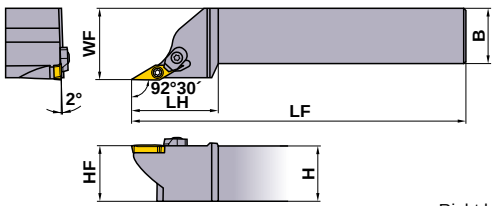
SXZC

External turning
Copying

DOUBLE CLAMP Type

Finish: SVX



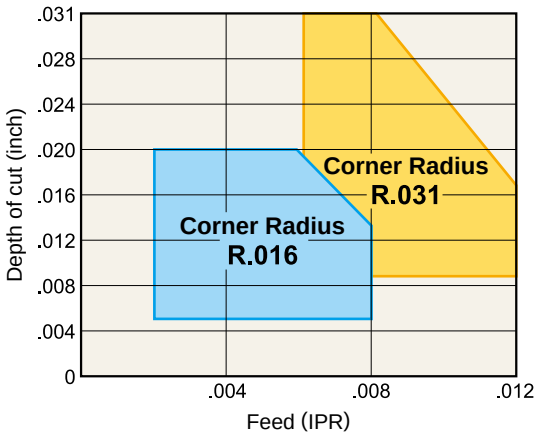


Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Clamp Screw *	Clamp Bridge	Clamp Bridge Screw *	Spring	Wrench (Insert)	Wrench (Clamp Bridge)
SXZCR/L1616H15	●	●	XCMT	22□SVX	16	16	100	35	16	20	TS255	AMS3	AJS3010T10	ASS2	TKY08F	TKY10F
SXZCR/L**2020K15**	●	●		22□SVX	20	20	125	35	20	25	TS255	AMS3	AJS3010T10	ASS2	TKY08F	TKY10F
SXZCR/L**2525M15**	●	●		22□SVX	25	25	150	40	25	32	TS255	AMS3	AJS3010T10	ASS2	TKY08F	TKY10F

∗ Clamp Torque (lbf-in) : TS255=8.9, AJS3010T10=22

APPLICATION RANGE



RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	**UE6020**	490−1150
	General Steel	150HB−250HB	**UE6020**	330−820

(Note) The above cutting conditions are general guide lines.
Adjustments maybe necessary depending on machine rigidity, workpiece geometry and clamping.

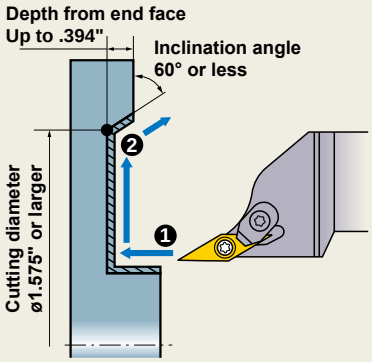
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

● : Inventory maintained.

SXZC type inserts ➤ A173

OPERATIONAL GUIDANCE

Notes when end face profiling



Pay special attention to the following when face profiling.

Machining of an outer diameter (Step ①)

- To prevent burr formation, the depth of cut should be less than half the corner radius.

Machining of an inclination (Step ②)

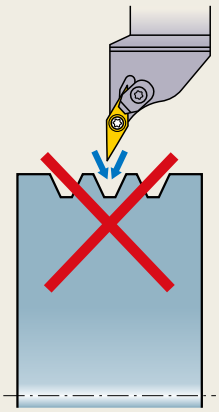
- To reduce the contact length of chips, the depth of cut should be less than half the corner radius.
- To prevent interference between the tool and the workpiece, the cutting diameter should be 1.575" or larger, inclination angle 60° or less and depth from the end face up to .394".

When changing inserts

- When indexing the inserts, it is recommended to preset the cutting edge position to maintain machining accuracy.

Not possible

Machining of V-pulleys



When machining V-pulleys, use a VNMG insert

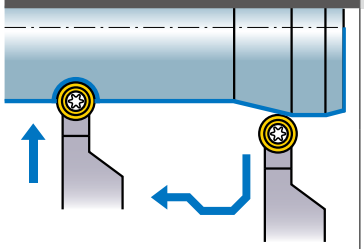
RP INSERTS TOOL HOLDERS

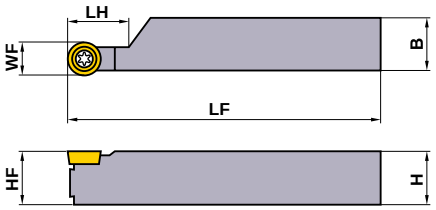
SRDPR/L

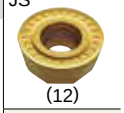
External turning
Copying

Screw Clamp Type
***SP* Holder**

Medium
JS







Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (inch)						*	
	R	L		WF	H	B	LF	LH	HF	Clamp Screw	Wrench
SRDPR/L-1612	●	●	RPMT120400E-JS	.500	1.000	1.000	6.000	1.000	1.000	TS43	TKY15F

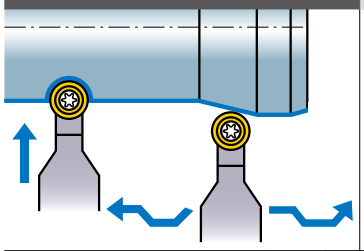
* Clamp Torque (lbf-in) : TS43=31

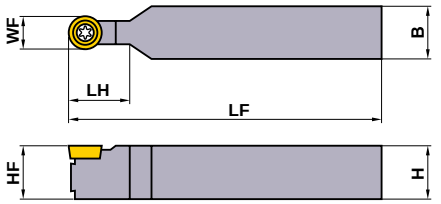
SRDPN

External turning
Copying

Screw Clamp Type
***SP* Holder**

Medium
JS







Order Number	Stock	Insert Number	Dimensions (inch)						*	
			WF	H	B	LF	LH	HF	Clamp Screw	Wrench
SRDPN-1612	●	RPMT120400E-JS	.500	1.000	1.000	6.000	1.000	1.000	TS43	TKY15F

* Clamp Torque (lbf-in) : TS43=31

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

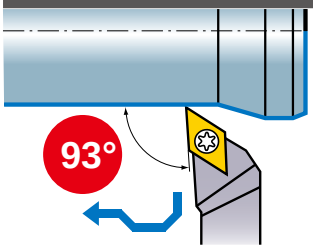
SRDPR/L type inserts ➤ J022
SRDPN type inserts ➤ J022
CUTTING CONDITIONS ➤ A074

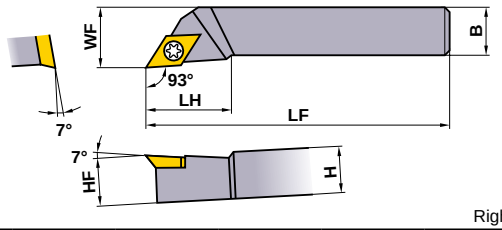
● : Inventory maintained.

SDJE

External turning
Copying

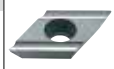
Screw Clamp Type for Aluminum
***AL* Holder**





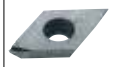
Right hand tool holder shown.

Medium
R/L



(4)

PCD
R/L-F



(4)

Order Number	Stock		Insert Number		Dimensions (inch)						*	
	R	L			H	B	LF	LH	HF	WF	Clamp Screw	Wrench
SDJER/L-104	●	●	DEGX	43□R/L	.625	.625	4.000	1.000	.625	.750	CS451190T	TKY20F
SDJER/L-124	●	●		43□R/L	.750	.750	4.500	1.000	.750	.875	CS451190T	TKY20F
SDJER/L-164	●	●		43□R/L	1.000	1.000	6.000	1.100	1.000	1.250	CS451190T	TKY20F

* Clamp Torque (lbf-in) : CS451190T=44

RECOMMENDED CUTTING CONDITIONS

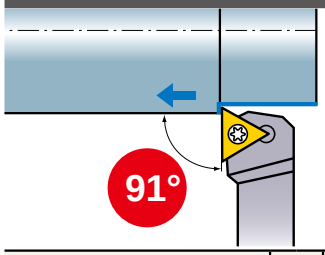
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
N	Aluminum Alloy	**HTi10**	1310	.002—.012	.008—.118

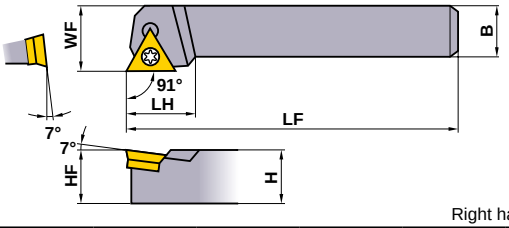
SDJE type inserts ➤ **A150**
PCD inserts ➤ **B062**
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

TE○○ INSERTS TOOL HOLDERS

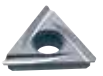
STGE

External turning — ***Screw Clamp Type for Aluminum*** **AL Holder**





Right hand tool holder shown.

Medium
R/L

(3)
PCD
R/L

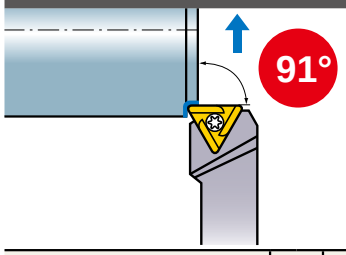
(3)

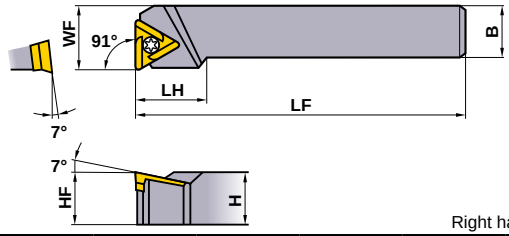
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	* Clamp Screw	Wrench
STGER/L-103	●	●	TEGX	32○R/L	.625	.625	4.000	.800	.625	.750	FC400890T	TKY10F
STGER/L**-123**	●	●	TEGX	32○R/L	.750	.750	4.500	.800	.750	.875	FC400890T	TKY10F
STGER/L**-163**	●	●	TEGX	32○R/L	1.000	1.000	6.000	.900	1.000	1.250	FC400890T	TKY10F

(Note) Right hand toolholder uses right hand insert. Left hand toolholder uses left hand insert.
∗ Clamp Torque (lbf-in) : FC400890T=22

STFE

Facing — ***Screw Clamp Type for Aluminum*** **AL Holder**





Right hand tool holder shown.

Medium
R/L

(3)
PCD
R/L

(3)

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	* Clamp Screw	Wrench
STFER/L-103	●	●	TEGX	32○R/L	.625	.625	4.000	.866	.625	.750	FC400890T	TKY10F
STFER/L**-123**	●	●	TEGX	32○R/L	.750	.750	4.500	.866	.750	1.000	FC400890T	TKY10F
STFER/L**-163**	●	●	TEGX	32○R/L	1.000	1.000	6.000	.866	1.000	1.250	FC400890T	TKY10F

(Note) Right hand toolholder uses left hand insert. Left hand toolholder uses right hand insert.
∗ Clamp Torque (lbf-in) : FC400890T=22

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

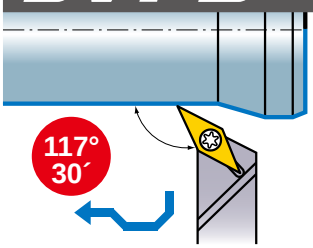
STGE type inserts ➤ A158
STFE type inserts ➤ A158
PCD inserts ➤ B062

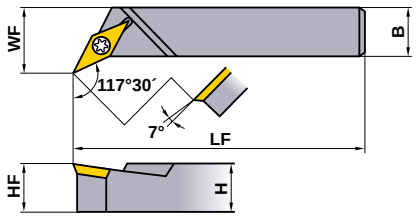
● : Inventory maintained.

SVPD

External turning
Copying

Screw Clamp Type for Aluminum
***AL* Holder**





Right hand tool holder shown.

Finish
R/L

(3)
PCD
R/L-F

(3)

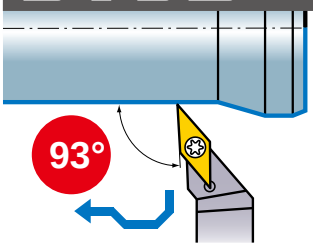
Order Number	Stock		Insert Number		Dimensions (inch)					*	
	R	L			H	B	LF	HF	WF	Clamp Screw	Wrench
SVPDR/L-123	●	●	VDGX	32□R/L	.750	.750	4.500	.750	1.000	FC400890T	TKY10F
SVPDR/L**-163**	●	●	VDGX	32□R/L	1.000	1.000	6.000	1.000	1.250	FC400890T	TKY10F

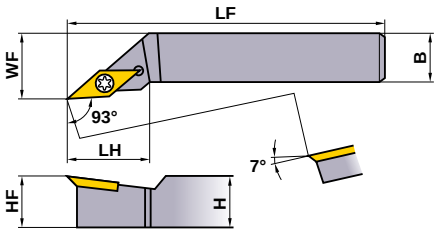
(Note) Right hand toolholder uses right hand insert. Left hand toolholder uses left hand insert.
* Clamp Torque (lbf-in) : FC400890T=22

SVJD

External turning
Copying

Screw Clamp Type for Aluminum
***AL* Holder**





Right hand tool holder shown.

Finish
R/L

(3)
PCD
R/L-F

(3)

Order Number	Stock		Insert Number		Dimensions (inch)						*	
	R	L			H	B	LF	LH	HF	WF	Clamp Screw	Wrench
SVJDR/L-103	●	●	VDGX	32□R/L	.625	.625	4.000	1.100	.625	.750	FC400890T	TKY10F
SVJDR/L**-123**	●	●	VDGX	32□R/L	.750	.750	4.500	1.100	.750	.875	FC400890T	TKY10F
SVJDR/L**-163**	●	●	VDGX	32□R/L	1.000	1.000	6.000	1.200	1.000	1.250	FC400890T	TKY10F

(Note) Right hand toolholder uses right hand insert. Left hand toolholder uses left hand insert.
* Clamp Torque (lbf-in) : FC400890T=22

RECOMMENDED CUTTING CONDITIONS

	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
N	Aluminum Alloy	**HTi10**	1310	.002—.012	.008—.118

SVPD type inserts ➤ **A168**
SVJD type inserts ➤ **A168**
PCD inserts ➤ **B063**
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

RG INSERTS TOOL HOLDERS

SRSGR/L

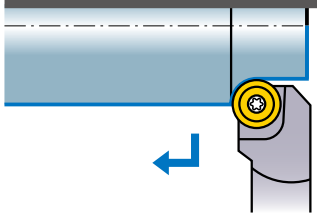
External turning
Copying

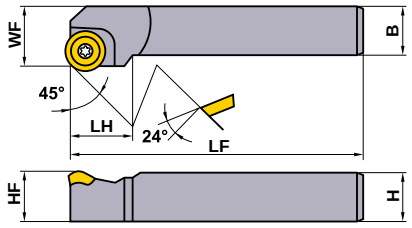
Screw Clamp Type
***SR* Holder**

Medium
Standard



(20)





Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (inch)						*	
	R	L		H	B	LF	LH	HF	WF	Clamp Screw	Wrench
SRSGR/L-1620M	●	●	RGGM2004M0	1.000	1.000	6.000	1.181	1.000	1.250	TS5	TKY25F
SRSGR/L**-8520M**	●			1.250	1.000	7.000	1.181	1.250	1.250	TS5	TKY25F

* Clamp Torque (lbf-in) : TS5=66

SRSGN

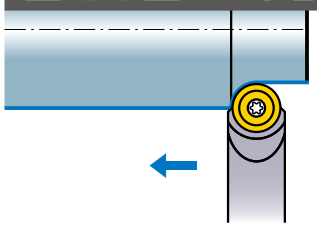
External turning

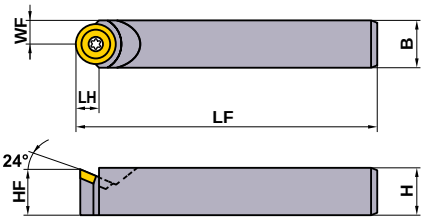
Screw Clamp Type
***SR* Holder**

Medium
Standard



(20)





Order Number	Stock	Insert Number	Dimensions (inch)						*	
			H	B	LF	LH	HF	WF	Clamp Screw	Wrench
SRSGN-1620M	●	RGGM2004M0	1.000	1.000	6.000	.310	1.000	.500	TS5	TKY25F
SRSGN**-8520M**	●		1.250	1.000	7.000	.310	1.250	.500	TS5	TKY25F

* Clamp Torque (lbf-in) : TS5=66

● : Inventory maintained. (10 inserts in one case)

CUTTING CONDITIONS ➤ A074

Memo

GUIDE TO SMALL TOOLS

●Section organization

①Organized according to cutting mode of small tools.
(Refer to the index on the next page.)
②In order of Turning→External Grooving→External Cutting Off→Threading→Boring.

TYPE OF TOOL HOLDER
indicates the first four letters of the order number, as well as cutting applications.

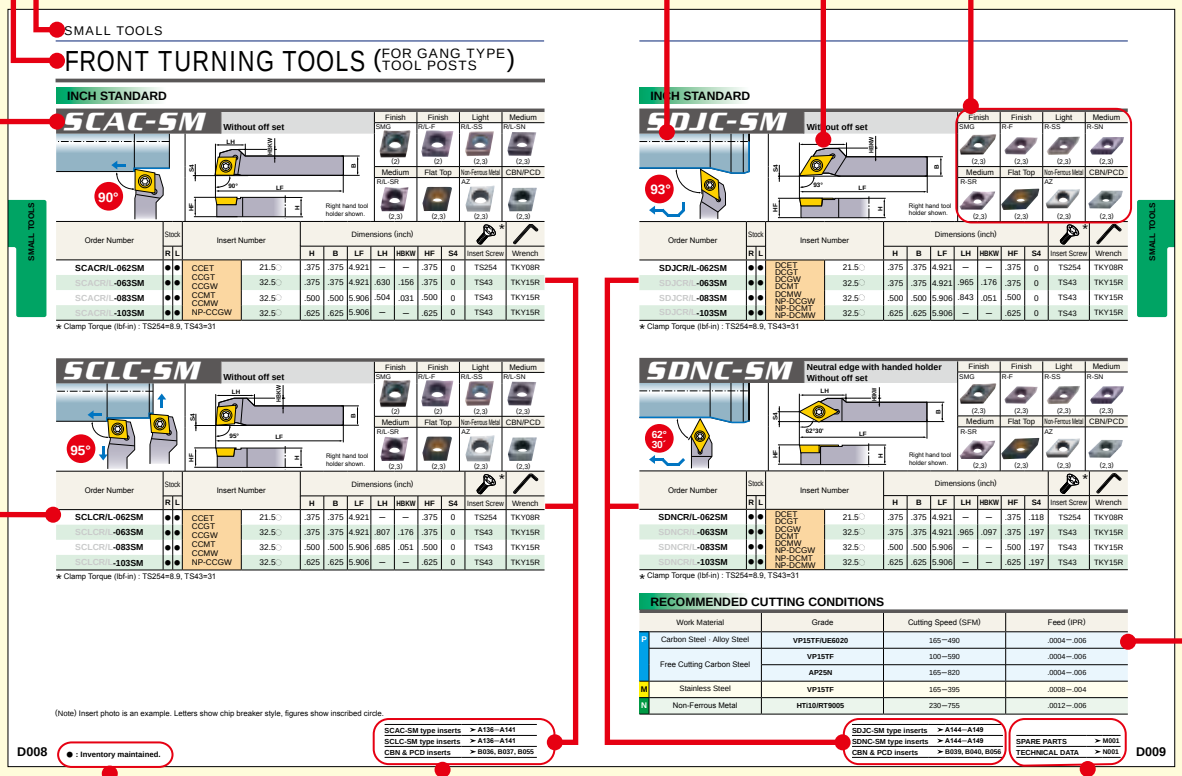
APPLICATION

PRODUCT SECTION

FIGURE SHOWING TOOLING APPLICATION
uses illustrations and arrows to depict the available machining applications such as external turning, copying, facing, and chamfering together with cutting edge lead angles.

GEOMETRY

CHIP BREAKER BY CUTTING APPLICATION



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

REFERENCE PAGE FOR APPLICABLE INSERTS
indicates reference pages giving details of inserts that are applicable to the product.

PAGE REFERENCE
·SPARE PARTS
·TECHNICAL DATA
indicates reference pages, including the above, on the right hand page of each double-page spread.

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, and spare parts.

RECOMMENDED CUTTING CONDITIONS
for each work material classification, indicates recommended cutting conditions according to the ISO categories for cutting grades, P, M and N.

●To Order : Please specify order number and hand of tool (right/left).

TURNING

SMALL TOOLS

⁎Arranged by Alphabetical order

D016 **BTAH** (INCH STANDARD)
D019 **BTAH** (METRIC STANDARD)
D016 **BTAT** INSERTS
D017 **BTBT** INSERTS
D018 **BTVH** (INCH STANDARD)
D021 **BTVH** (METRIC STANDARD)
D018 **BTVT** INSERTS
D041 **CSVH** (INCH STANDARD)
D044 **CSVH** (METRIC STANDARD)
D042 **CSVTB** INSERTS
D042 **CSVTBXL** INSERTS
D042 **CSVTC** INSERTS
D041 **CSVTF** INSERTS
D041 **CSVTFXL** INSERTS
D043 **CSVTG** INSERTS
D043 **CSVTT** INSERTS
D026 **CTAH** (INCH STANDARD)
D028 **CTAH** (METRIC STANDARD)
D026 **CTAH-S** (INCH STANDARD)
D028 **CTAH-S** (METRIC STANDARD)
D027 **CTAT** INSERTS
D017 **CTBH** (INCH STANDARD)
D030 **CTBH** (INCH STANDARD)
D020 **CTBH** (METRIC STANDARD)
D031 **CTBH** (METRIC STANDARD)
D030 **CTBT** INSERTS
D032 **CTCH** (METRIC STANDARD)
D032 **CTCT** INSERTS
D033 **CTDH** (METRIC STANDARD)
D033 **CTDT** INSERTS
D034 **CTEH** (METRIC STANDARD)
D034 **CTET** INSERTS
D022 **GTAH/GTBH/GTCH** (INCH STANDARD)
D024 **GTAH/GTBH/GTCH** (METRIC STANDARD)
D022 **GTAT/GTBT/GTCT** INSERTS
D038 **MMTE** (INCH STANDARD)
D047 **SBAH** (METRIC STANDARD)
D047 **SBAT** INSERTS
D008 **SCAC-SM** (INCH STANDARD)
D012 **SCAC-SM** (METRIC STANDARD)
D008 **SCLC-SM** (INCH STANDARD)
D012 **SCLC-SM** (METRIC STANDARD)
D009 **SDJC-SM** (INCH STANDARD)
D013 **SDJC-SM** (METRIC STANDARD)
D009 **SDNC-SM** (INCH STANDARD)
D013 **SDNC-SM** (METRIC STANDARD)
D039 **SH** (INCH STANDARD)
D040 **SH** (METRIC STANDARD)
D010 **SVJB-SM** (INCH STANDARD)
D014 **SVJB-SM** (METRIC STANDARD)
D010 **SVLP-SM** (INCH STANDARD)
D014 **SVLP-SM** (METRIC STANDARD)
D015 **SVPP-SM** (METRIC STANDARD)
D011 **SVVB-SM** (INCH STANDARD)
D015 **SVVB-SM** (METRIC STANDARD)
D035 **TTAH** (INCH STANDARD)
D036 **TTAH** (METRIC STANDARD)
D035 **TTAT** INSERTS

OUTLINE OF SMALL TOOLS ····· D002
CLASSIFICATION ····· D004

STANDARD

GANG TYPE TOOL POSTS

	INCH	METRIC
FRONT TURNING TOOLS		
SCAC-SM	D008	D012
SCLC-SM	D008	D012
SDJC-SM	D009	D013
SDNC-SM	D009	D013
SVLP-SM	D010	D014
SVJB-SM	D010	D014
SVVB-SM	D011	D015
SVPP-SM	—	D015
BACK TURNING TOOLS		
BTAH	D016	D019
CTBH	D017	D020
BTVH	D018	D021
GROOVING TOOLS		
GTAH / GTBH / GTCH	D022	D024
GYS (For Swiss style lathes)	F038	F062
CUTTING OFF TOOLS		
CTAH / CTAH-S	D026	D028
CTBH	D030	D031
CTCH	D032	
CTDH	D033	
CTEH	D034	
THREADING TOOLS		
TTAH	D035	D036
MMTE	D038	—
BORING TOOLS		
SBAH	D047	

OPPOSITE TOOL POSTS

DIMPLE SLEEVE HOLDER		
SH	D039	D040

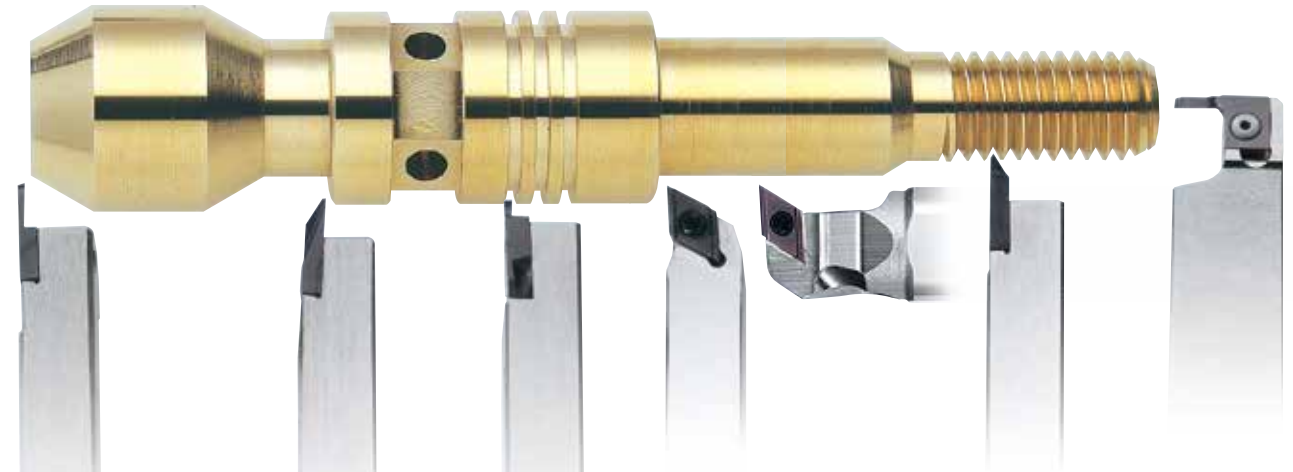
RADIAL TYPE TOOL POSTS

CSVH	D041	D044
CSVTF	D041	D044
CSVTFXL	D041	D044
CSVTC	D042	D045
CSVTB	D042	D045
CSVTBXL	D042	D045
CSVTG	D043	D046
CSVTT	D043	D046

⁎For GY Swiss please refer to section F Grooving tools.

OUTLINE OF SMALL TOOLS

TOOLS FOR GANG TYPE TOOL POSTS



Cutting Off | Back Turning | Grooving | Front Turning | Threading | Internal Turning

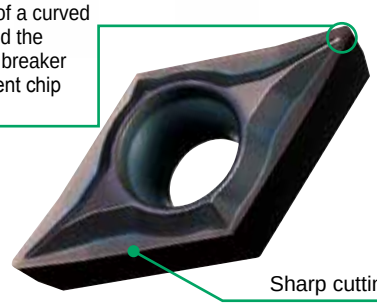


SMG Breaker Insert

Corner radii designed with minus tolerance

- Suitable for precision parts applications that often require minus tolerance dimensions.
- The order number is shown with the letter "M" that indicates minus tolerance. ex) DCGT21.51MSMG
- The radius value is printed on the side of the insert label for easy recognition.

A combination of a curved cutting edge and the protrusion type breaker promotes efficient chip breaking.

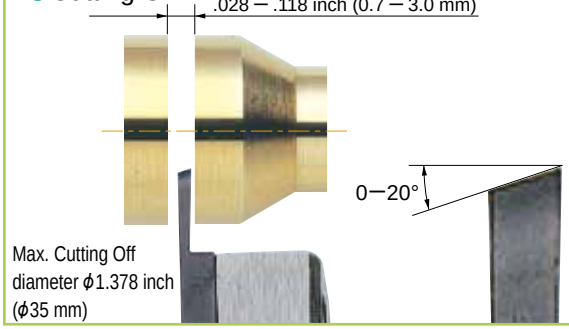


Tolerance Corner R

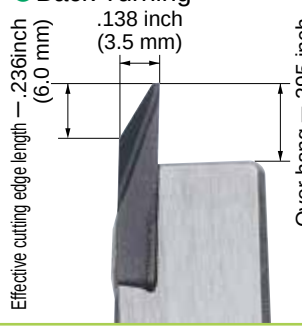


SMG breaker insert	E class
RE $^{0}_{-.002}$ inch	RE $^{0}_{-.0008}$ inch
(Conventional G class RE ± .004 inch)	

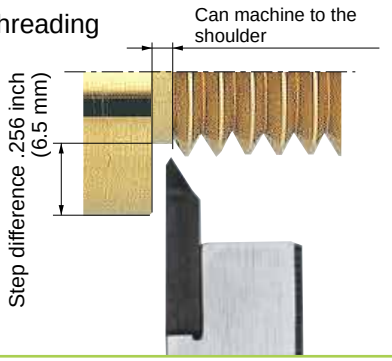
Cutting Off



Back Turning



Threading



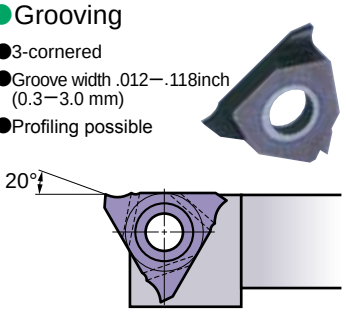
Back Clamping Mechanism



The screw designed for common use of front and back enables back clamping.

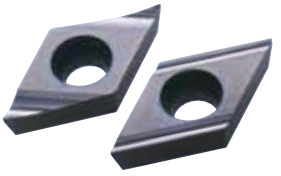
Grooving

- 3-cornered
- Groove width .012–.118inch (0.3–3.0 mm)
- Profiling possible



Front Turning

- ISO E class insert
- A wide variety of small corner R
- Rake angle 30°



Tools responding to a wide range of small parts machining operations

External Turning	Tools for front turning, back turning, grooving, threading, and cutting off
Internal Turning	Tools for boring, internal grooving, and internal threading
Drilling	Drills
End Milling	End mills

Tools for front turning, back turning, grooving, threading, and cutting off

Tool Post Type	Gang type, Turret type Radial type
Tool Size	Square holder : .375－.625 inch (8－16 mm) Round holder : ≤ϕ1 inch (ϕ25.4 mm)

Indexable inserts developed under the concept of "high quality, high efficiency, and long tool life."

High Quality	E class tolerance, sharp cutting edge, high accuracy small corner R, smooth surface finish.
Long Tool Life	Miracle Coating (VP15TF), cermet (NX2525), cemented carbide (HTi10).
High Efficiency	Regrinding not necessary due to the employment of indexable inserts. A wide variety of top cutting edge geometries.

TOOLS FOR SWISS STYLE LATHES WITH RADIAL TOOL POSTS

- The most suitable for swiss style lathes with radial tool posts.
- The most suitable for machining of small parts with work diameter ϕ5 mm (.197 inch) or smaller.
- Single holder responds to front turning, back turning, grooving, threading, and cutting off operations.





Front Turning **Back Turning** **Grooving** **Threading** **Cutting Off**

INTERNAL TURNING TOOLS

MICRO-MINI TWIN Boring bars
Min. cutting diameter ϕ2.2 mm－

Boring
Grooving
Threading

Round holder

Square holder



MICRO-DEX Boring bars
Min. cutting diameter ϕ5.0 mm－



DIMPLE BAR
Min. cutting diameter
ϕ .39 inch－

DRILLING TOOLS

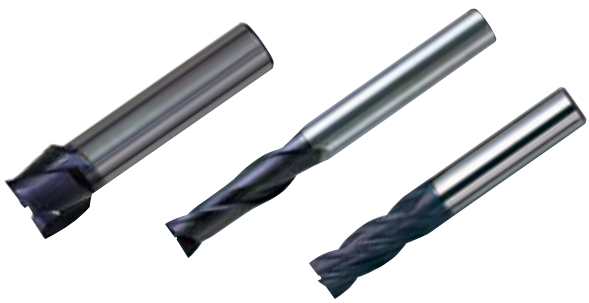
- Solid Carbide Drills



TAF Drill
Min. cutting diameter
ϕ .468 inch－

END MILLING TOOLS

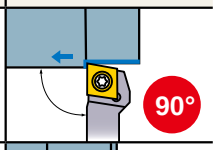
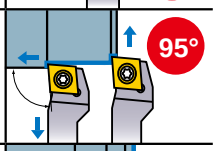
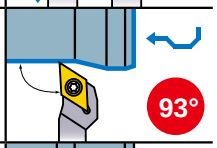
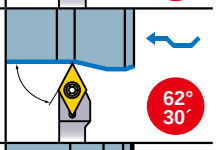
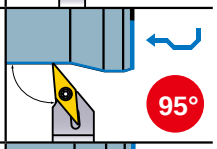
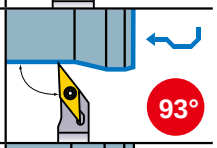
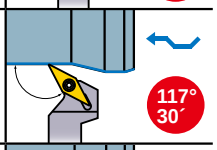
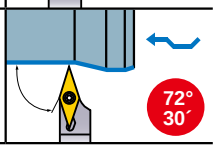
- Solid Carbide End Mills



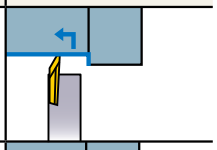
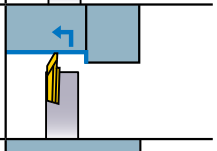
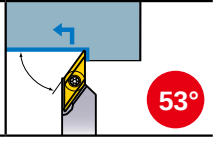
CLASSIFICATION (EXTERNAL TURNING)

GANG TYPE TOOL POSTS

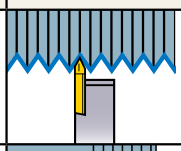
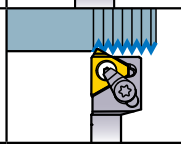
FRONT TURNING

Name of Tool Holder	Tool Size (H x B x LF) Inch	Tool Size (H x B x LF) Metric	Geometry
SCAC-SM Inch ➲ D008 Metric ➲ D012	.375 x .375 x 4.921 .500 x .500 x 5.906 .625 x .625 x 5.906	8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SCLC-SM Inch ➲ D008 Metric ➲ D012	.375 x .375 x 4.921 .500 x .500 x 5.906 .625 x .625 x 5.906	8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SDJC-SM Inch ➲ D009 Metric ➲ D013	.375 x .375 x 4.921 .500 x .500 x 5.906 .625 x .625 x 5.906	8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SDNC-SM Inch ➲ D009 Metric ➲ D013	.375 x .375 x 4.921 .500 x .500 x 5.906 .625 x .625 x 5.906	8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SVLP-SM Inch ➲ D010 Metric ➲ D014	.375 x .375 x 5.000 .500 x .500 x 6.000 .625 x .625 x 6.000	10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SVJB-SM Inch ➲ D010 Metric ➲ D014	.375 x .375 x 4.921 .500 x .500 x 5.906 .625 x .625 x 5.906	10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SVPP-SM Metric ➲ D015	–	10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SVVB-SM Inch ➲ D011 Metric ➲ D015	.375 x .375 x 4.921 .500 x .500 x 5.906 .625 x .625 x 5.906	10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	

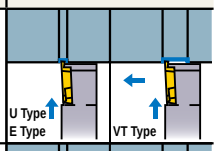
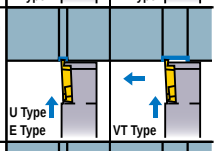
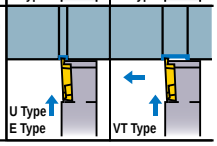
BACK TURNING

Name of Tool Holder	Tool Size (H x B x LF) Inch	Tool Size (H x B x LF) Metric	Geometry
BTAH (Edge Length) .110, .138, .197 inch 2.8, 3.5, 5.0 mm Inch ➲ D016 Metric ➲ D019	.375 x .375 x 4.724 .500 x .500 x 4.724 .625 x .625 x 4.724	8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
CTBH (Edge Length) .177, .236 inch 4.5, 6.0 mm Inch ➲ D017 Metric ➲ D020	.375 x .375 x 4.724 .500 x .500 x 4.724 .625 x .625 x 4.724	10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
BTVH (Edge Length) .295 inch 7.5 mm Inch ➲ D018 Metric ➲ D021	.375 x .375 x 4.724 .500 x .500 x 4.724 .625 x .625 x 4.724	10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	

THREADING

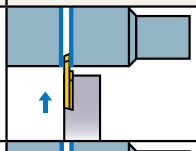
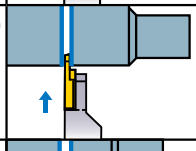
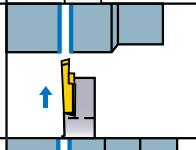
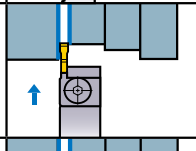
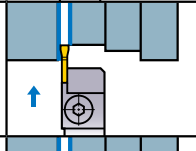
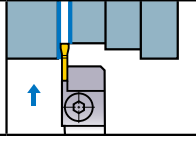
Name of Tool Holder	Tool Size (H x B x LF) Inch	Tool Size (H x B x LF) Metric	Geometry
TTAH Inch ➲ D035 Metric ➲ D036	.375 x .375 x 4.724 .500 x .500 x 4.724 .625 x .625 x 4.724	8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
MMTE Inch ➲ D038	.375 x .375 x 4.724 .500 x .500 x 4.724	–	

GROOVING

Name of Tool Holder	Tool Size (H x B x LF) Inch	Tool Size (H x B x LF) Metric	Geometry
GTAH (Grooving Width) .012-.055 inch 0.3-3.0 mm Inch ➲ D022 Metric ➲ D024	.375 x .375 x 3.150 .500 x .500 x 3.150 .500 x .500 x 4.724 .625 x .625 x 4.724	8 x 8 x 80 8 x 8 x 120 10 x 10 x 80 10 x 10 x 120 12 x 12 x 80 12 x 12 x 120 16 x 16 x 120	
GTBH (Grooving Width) .057-.089 inch 1.45-3.0 mm Inch ➲ D022 Metric ➲ D024	.375 x .375 x 3.150 .375 x .375 x 4.724 .500 x .500 x 4.724 .625 x .625 x 4.724	10 x 10 x 80 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
GTCH (Grooving Width) .098-.118 inch 2.5-3.0 mm Inch ➲ D022 Metric ➲ D024	.375 x .375 x 3.150 .375 x .375 x 4.724	10 x 10 x 80 10 x 10 x 120	

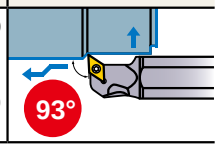
(Note) For GY style lathes please refer page F038 or F062.

CUTTING OFF

Name of Tool Holder	Tool Size (H x B x LF) Inch	Tool Size (H x B x LF) Metric	Geometry
CTAH (Max.Cut Off Diameter) .472 inch 12 mm Inch ➲ D026 Metric ➲ D028	.375 x .375 x 4.724 .500 x .500 x 4.724 .625 x .625 x 4.724	8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
CTAH-S (Max.Cut Off Diameter) .472 inch 12 mm Inch ➲ D026 Metric ➲ D028	.375 x .375 x 3.150 .500 x .500 x 3.150	10 x 10 x 80	
CTBH (Max.Cut Off Diameter) .630 inch 16 mm Inch ➲ D030 Metric ➲ D031	.375 x .375 x 4.724 .500 x .500 x 4.724 .625 x .625 x 4.724	10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
CTCH (Max.Cut Off Diameter) .787 inch 20 mm Metric ➲ D032	–	10 x 10 x 120 12 x 12 x 120	
CTDH (Max.Cut Off Diameter) .906-1.378 inch 23-35 mm Metric ➲ D033	–	16 x 16 x 120 16 x 16 x 125	
CTEH (Max.Cut Off Diameter) .906-1.378 inch 23-35 mm Metric ➲ D034	–	16 x 16 x 120 16 x 16 x 125	

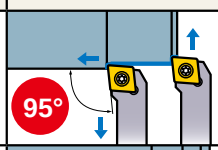
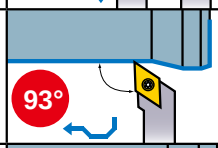
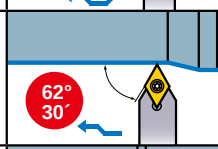
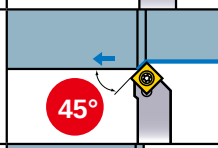
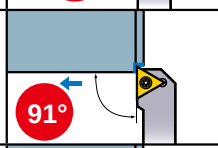
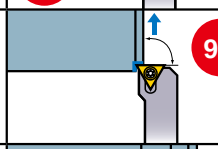
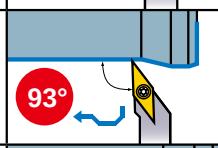
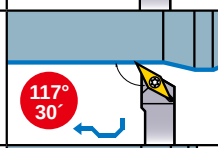
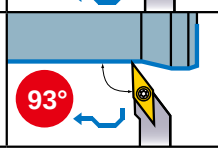
OPPOSITE TOOL POSTS

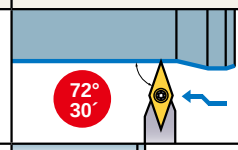
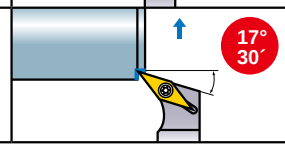
DIMPLE SLEEVE HOLDER

Name of Tool Holder	Shank Size (DCON x LF) Inch	Shank Size (DCON x LF) Metric	Geometry
SH Inch ➲ **D039** Metric ➲ **D040**	.625 x 3.937 .750 x 4.921 .787 x 4.921 .866 x 4.921 1.000 x 5.906	ϕ15.875 x 100 ϕ19.05 x 125 ϕ20 x 125 ϕ22 x 125 ϕ25.4 x 150	

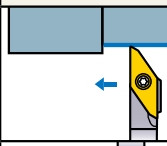
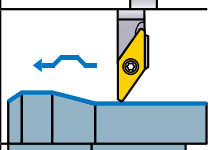
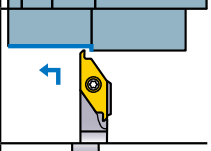
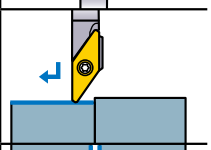
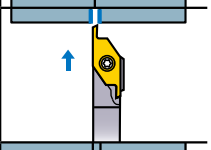
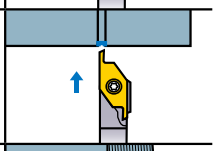
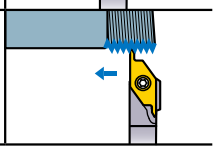
TURRET TYPE TOOL POSTS

FRONT TURNING

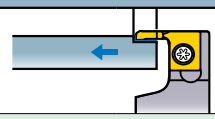
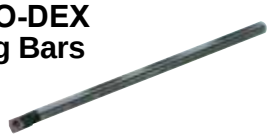
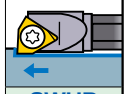
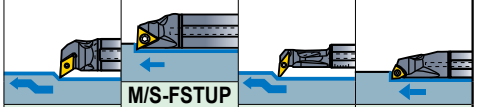
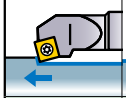
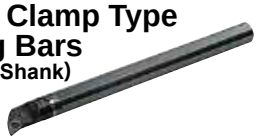
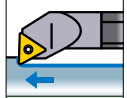
Name of Tool Holder	Shank Size (inch) (H x B x LF)	Geometry
SCLC Inch ➲ **C030**	.375 x .375 x 2.500 .500 x .500 x 3.500 .625 x .625 x 4.000	
SDJC Inch ➲ **C031**	.375 x .375 x 2.500 .500 x .500 x 3.500 .625 x .625 x 4.000	
SDNC Inch ➲ **C031**	.375 x .375 x 2.500 .500 x .500 x 3.500 .625 x .625 x 4.000	
SSSC Inch ➲ **C034**	.500 x .500 x 3.500 .625 x .625 x 4.000	
STGC Inch ➲ **C035**	.375 x .375 x 2.500 .500 x .500 x 3.500 .625 x .625 x 4.000	
STFC Inch ➲ **C035**	.375 x .375 x 2.500 .500 x .500 x 3.500 .625 x .625 x 4.000	
SVJC Inch ➲ **C036**	.375 x .375 x 2.500 .500 x .500 x 3.500 .625 x .625 x 4.000	
SVPC Inch ➲ **C036**	.500 x .500 x 3.500 .625 x .625 x 4.000	
SVJB Inch ➲ **C028**	.375 x .375 x 2.500 .500 x .500 x 3.500 .625 x .625 x 4.000	

Name of Tool Holder	Shank Size (inch) (H x B x LF)	Geometry
SVVB Inch ➲ **C028**	.375 x .375 x 2.500 .500 x .500 x 3.000 .625 x .625 x 4.000	
SVHB Inch ➲ **C029**	.375 x .375 x 2.500 .500 x .500 x 3.500 .625 x .625 x 4.000	

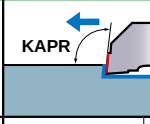
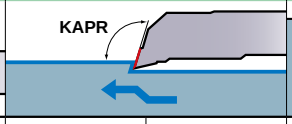
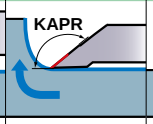
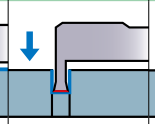
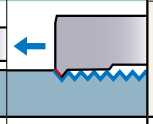
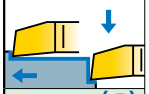
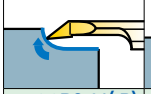
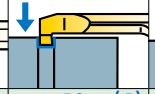
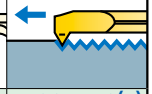
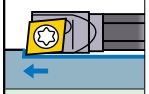
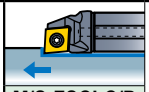
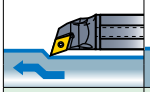
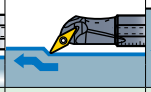
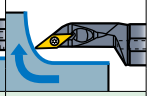
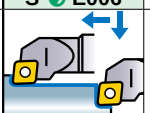
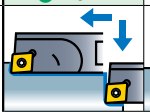
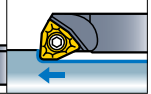
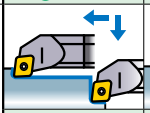
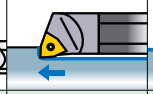
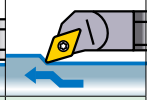
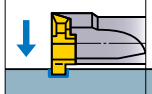
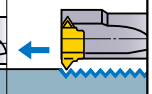
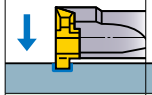
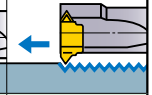
RADIAL TYPE TOOL POSTS

Name of Tool Holder	Tool Size (H x B x LF) Inch	Tool Size (H x B x LF) Metric	Geometry
CSVH (Front Turning) Inch ➲ **D041** Metric ➲ **D044**	.375 x .375 x 5.512 .500 x .500 x 5.512	7 x 7 x140 8 x 8 x140 9.5 x 9.5 x140 10 x10 x 140 12 x12 x 140	
CSVH (Front Copying) Inch ➲ **D041** Metric ➲ **D044**	.375 x .375 x 5.512 .500 x .500 x 5.512	7 x 7 x140 8 x 8 x140 9.5 x 9.5 x140 10 x10 x 140 12 x12 x 140	
CSVH (Back Turning) Inch ➲ **D042** Metric ➲ **D045**	.375 x .375 x 5.512 .500 x .500 x 5.512	7 x 7 x140 8 x 8 x140 9.5 x 9.5 x140 10 x10 x 140 12 x12 x 140	
CSVH (Back Turning) Inch ➲ **D042** Metric ➲ **D045**	.375 x .375 x 5.512 .500 x .500 x 5.512	7 x 7 x140 8 x 8 x140 9.5 x 9.5 x140 10 x10 x 140 12 x12 x 140	
CSVH (Cutting Off) Inch ➲ **D042** Metric ➲ **D045**	.375 x .375 x 5.512 .500 x .500 x 5.512	7 x 7 x140 8 x 8 x140 9.5 x 9.5 x140 10 x10 x 140 12 x12 x 140	
CSVH (Grooving) Inch ➲ **D043** Metric ➲ **D046**	.375 x .375 x 5.512 .500 x .500 x 5.512	7 x 7 x140 8 x 8 x140 9.5 x 9.5 x140 10 x10 x 140 12 x12 x 140	
CSVH (Threading) Inch ➲ **D043** Metric ➲ **D046**	.375 x .375 x 5.512 .500 x .500 x 5.512	7 x 7 x140 8 x 8 x140 9.5 x 9.5 x140 10 x10 x 140 12 x12 x 140	

CLASSIFICATION (INTERNAL TURNING)

Min. Cutting Dia.	Name of Tool Holder	Features	KAPR = 75°	KAPR = 93°
ϕ3.0mm (ϕ.118 inch)	**For Gang Type Tool Posts SBAH** 	● The minimum cutting diameter is ϕ3mm (.118inch). ● Tools for Gang type Swiss type lathes.		 SBAH ➔ D047
ϕ2.2mm ~ ϕ7.2mm (ϕ.087 ~ ϕ.283 inch)	**MICRO-MINI TWIN Boring Bars (Solid Carbide)** 	● The minimum cutting diameter is ϕ2.2mm (.087inch). ● Two cutting edges type. ● Continuous cutting from boring to facing. ● With or without a chip breaker.		
ϕ3.2mm ~ ϕ5.2mm (ϕ.126 ~ ϕ.205 inch)	**MICRO-MINI Boring Bars (Solid Carbide)** 	● The minimum cutting diameter is from ϕ3.2mm (.126inch). ● Single cutting edge type. ● l/d is 5 times the diameter. ● Cutting edge can be shaped according to the application. Thus, it covers a wide cutting range. (threading, grooving, copying, etc.)		 C○○FR-BLS ➔ E031
ϕ5.0mm ~ ϕ8.0mm (ϕ.197 ~ ϕ.315 inch)	**MICRO-DEX Boring Bars** 	● The minimum cutting diameter is from ϕ5mm (.197inch). ● 7°positive insert. ● Carbide shank type. ● Easy-to-use tool geometries. ● Suitable for small workpiece. ● l/d is 5 times the diameter.		 SWUB ➔ E029
ϕ.390 inch ~ ϕ.977 inch	**SCREW CLAMP DIMPLE BAR (Heavy Metal Shank) (Steel Shank)** 	● The minimum cutting diameter is ϕ.390inch. ● 7°, 11° positive insert. ● Excellent vibration resistance due to light dimple head. ● Coolant thru type.		 M-FSDUC ➔ E008 / M/S-FSTUP M ➔ E007 S ➔ E007 / M-FSVUB/C ➔ E009 / M-FSWUB/P ➔ E009
ϕ.228 inch ~ ϕ.937 inch	**Screw Clamp Type Boring Bars (Steel Shank)** 	● Two wall pocket. ● 7° positive insert, low cutting force. ● Screw clamp type. ● Steel, heavy metal and carbide shanks are available in various diameters.	 S-SSKC ➔ E015	 S-SDUC ➔ E014 / S-STUC ➔ E015 / S-SWUC ➔ E019
ϕ.200 inch ~ ϕ.750 inch	**Screw Clamp Type Boring Bars (Heavy Metal Shank)** 			
ϕ.228 inch ~ ϕ.797 inch	**Screw Clamp Type Boring Bars (Carbide Shank)** 			 C-STUC ➔ E016
ϕ.390 inch ~ ϕ.790 inch	**SL5 Type Boring Bars** 	● Multi-functional bar for threading, grooving and boring. ● Minimum bore ϕ.390inch. ● Rigid insert retention.		
ϕ10mm ~ ϕ20mm (ϕ.394 ~ ϕ.787 inch)	**F Type Boring Bars (FSL51,52)** 	● The minimum cutting diameter is ϕ10mm (.394inch). ● Single holder can be equipped with grooving inserts and threading inserts.		

(Note 1) Products with blue color symbol have carbide shank.

KAPR = 95°		KAPR = 107°30´–117°30´		KAPR = 142°	Grooving	Threading	Selection Standard: Economical	Low Cutting Resistance	Vibration Resistance	Coolant Thru	Specialized	Small Diameter Cutting
											◎	◎
 CB□□RS(-B) ➲ E032				 CR□□RS-01(-B) ➲ E033	 CG□□RS-□□(-B) ➲ F237	 CT□□RSM□(B) ➲ G039	◎	◎	◎			◎
								◎	◎			◎
 SCLC ➲ E029								◎	◎			◎
 M/S-FSCLC/P M ➲ E006 S ➲ E006		 M-FSDQC ➲ E008	 M-FSVPB/C ➲ E010	 M-FSVJC ➲ E010				◎	◎	◎		
 S-SCLC ➲ E012		 S-SDQC ➲ E013	 S-SVQC ➲ E016				◎	○	○			
 M-SCLC ➲ E012	 M-SWLO ➲ E020							○	○			
 C-SCLC ➲ E013	 C-SWLO ➲ E019	 C-SDQC ➲ E014						○	◎			
					 S-SL5N ➲ F235	 S-SL5N ➲ G037		○	○			○
					 FSL51, FSL52 ➲ F234	 FSL51, FSL52 ➲ G036		○	○			○

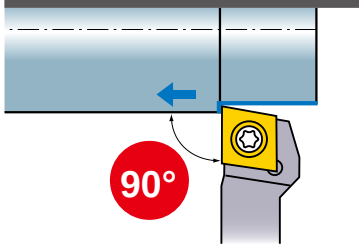
(Note 2) ◎: 1st recommendation. ○: 2nd recommendation.

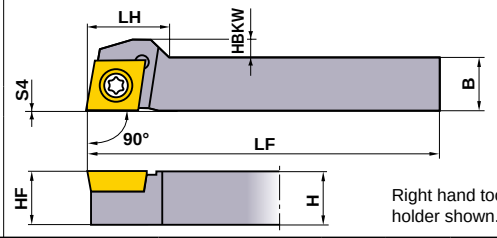
FRONT TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

SCAC-SM

Without off set





Right hand tool holder shown.

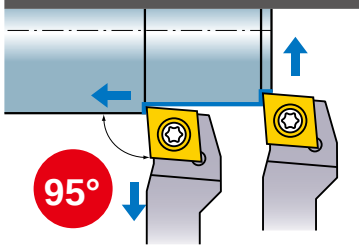
Finish	Finish	Light	Medium
SMG	R/L-F	R/L-SS	R/L-SN
 (2)	 (2)	 (2,3)	 (2,3)
Medium	**Flat Top**	**Non-Ferrous Metal**	**CBN/PCD**
R/L-SR		AZ	
 (2,3)	 (2,3)	 (2,3)	 (2,3)

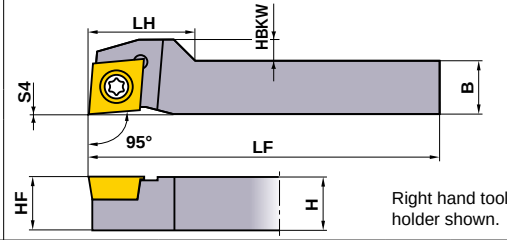
Order Number	Stock		Insert Number		Dimensions (inch)							*	
	R	L			H	B	LF	LH	HBKW	HF	S4	Insert Screw	Wrench
SCACR/L-062SM	●	●	CCET CCGT CCGW CCMT CCMW NP-CCGW	21.5°	.375	.375	4.921	—	—	.375	0	TS254	TKY08R
SCACR/L**-063SM**	●	●		32.5°	.375	.375	4.921	.630	.156	.375	0	TS43	TKY15R
SCACR/L**-083SM**	●	●		32.5°	.500	.500	5.906	.504	.031	.500	0	TS43	TKY15R
SCACR/L**-103SM**	●	●		32.5°	.625	.625	5.906	—	—	.625	0	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

SCLC-SM

Without off set





Right hand tool holder shown.

Finish	Finish	Light	Medium
SMG	R/L-F	R/L-SS	R/L-SN
 (2)	 (2)	 (2,3)	 (2,3)
Medium	**Flat Top**	**Non-Ferrous Metal**	**CBN/PCD**
R/L-SR		AZ	
 (2,3)	 (2,3)	 (2,3)	 (2,3)

Order Number	Stock		Insert Number		Dimensions (inch)							*	
	R	L			H	B	LF	LH	HBKW	HF	S4	Insert Screw	Wrench
SCLCR/L-062SM	●	●	CCET CCGT CCGW CCMT CCMW NP-CCGW	21.5°	.375	.375	4.921	—	—	.375	0	TS254	TKY08R
SCLCR/L**-063SM**	●	●		32.5°	.375	.375	4.921	.807	.176	.375	0	TS43	TKY15R
SCLCR/L**-083SM**	●	●		32.5°	.500	.500	5.906	.685	.051	.500	0	TS43	TKY15R
SCLCR/L**-103SM**	●	●		32.5°	.625	.625	5.906	—	—	.625	0	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

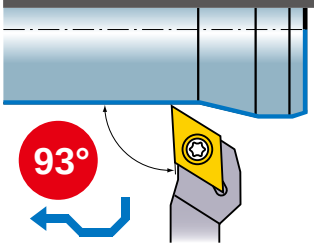
SCAC-SM type inserts	**➤ A136—A141**
SCLC-SM type inserts	**➤ A136—A141**
CBN & PCD inserts	**➤ B036, B037, B055**

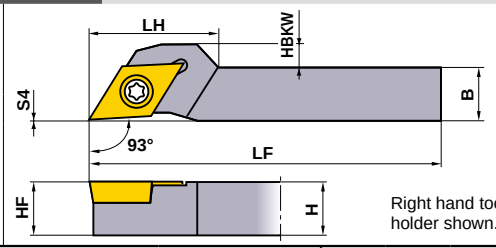
● : **Inventory maintained.**

INCH STANDARD

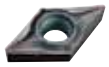
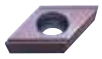
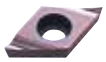
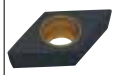
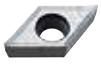
SDJC-SM

Without off set





Right hand tool holder shown.

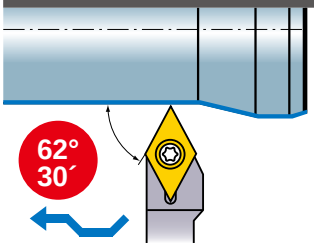
Finish	Finish	Light	Medium
SMG	R-F	R-SS	R-SN
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Flat Top**	**Non-Ferrous Metal**	**CBN/PCD**
R-SR		AZ	
			
(2,3)	(2,3)	(2,3)	(2,3)

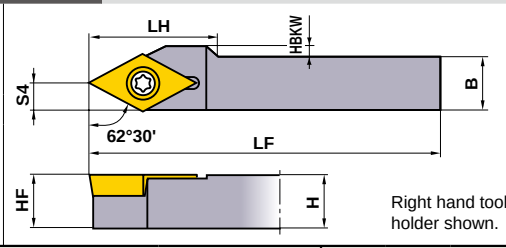
Order Number	Stock		Insert Number		Dimensions (inch)							*	
	R	L			H	B	LF	LH	HBKW	HF	S4	Insert Screw	Wrench
SDJCR/L-062SM	●	●	DCET DCGT DCGW DCMT DCMW NP-DCGW NP-DCMT NP-DCMW	21.5°	.375	.375	4.921	—	—	.375	0	TS254	TKY08R
SDJCR/L-063SM	●	●		32.5°	.375	.375	4.921	.965	.176	.375	0	TS43	TKY15R
SDJCR/L-083SM	●	●		32.5°	.500	.500	5.906	.843	.051	.500	0	TS43	TKY15R
SDJCR/L-103SM	●	●		32.5°	.625	.625	5.906	—	—	.625	0	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

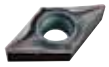
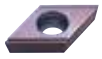
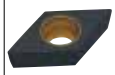
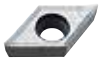
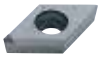
SDNC-SM

Neutral edge with handed holder
Without off set





Right hand tool holder shown.

Finish	Finish	Light	Medium
SMG	R-F	R-SS	R-SN
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Flat Top**	**Non-Ferrous Metal**	**CBN/PCD**
R-SR		AZ	
			
(2,3)	(2,3)	(2,3)	(2,3)

Order Number	Stock		Insert Number		Dimensions (inch)							*	
	R	L			H	B	LF	LH	HBKW	HF	S4	Insert Screw	Wrench
SDNCR/L-062SM	●	●	DCET DCGT DCGW DCMT DCMW NP-DCGW NP-DCMT NP-DCMW	21.5°	.375	.375	4.921	—	—	.375	.118	TS254	TKY08R
SDNCR/L-063SM	●	●		32.5°	.375	.375	4.921	.965	.097	.375	.197	TS43	TKY15R
SDNCR/L-083SM	●	●		32.5°	.500	.500	5.906	—	—	.500	.197	TS43	TKY15R
SDNCR/L-103SM	●	●		32.5°	.625	.625	5.906	—	—	.625	.197	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

RECOMMENDED CUTTING CONDITIONS

	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF/UE6020**	165—490	.0004—.006
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.006
P	Free Cutting Carbon Steel	**AP25N**	165—820	.0004—.006
M	Stainless Steel	**VP15TF**	165—395	.0008—.004
N	Non-Ferrous Metal	**HTi10/RT9005**	230—755	.0012—.006

SDJC-SM type inserts ➤ **A144—A149**
SDNC-SM type inserts ➤ **A144—A149**
CBN & PCD inserts ➤ **B039, B040, B056**

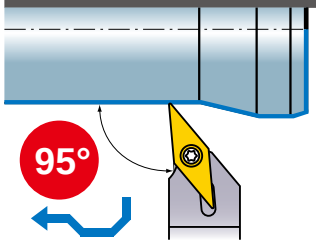
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

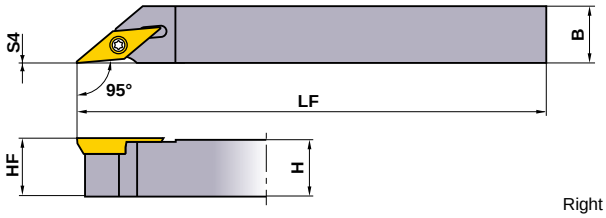
FRONT TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

SVLP-SM

Without off set





Right hand tool holder shown.

Finish R/L-SRF



(1.5, 2)

Finish SMG



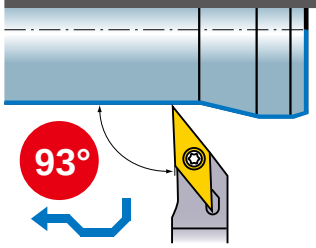
(1.5, 2)

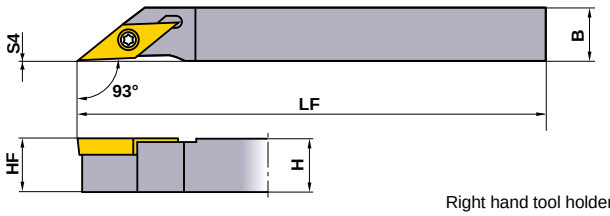
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	HF	S4	* Insert Screw	Wrench
SVLPR-061.5SM	●		VPET VPGT	1.51.5○	.375	.375	5.000	.375	0	TS202	TKY06R
SVLPR-081.5SM	●			1.51.5○	.500	.500	6.000	.500	0	TS202	TKY06R
SVLPR/L-062SM	●	●		22○	.375	.375	5.000	.375	0	TS255	TKY08R
SVLPR/L-082SM	●	●		22○	.500	.500	6.000	.500	0	TS255	TKY08R
SVLPR/L-102SM	●	●		22○	.625	.625	6.000	.625	0	TS255	TKY08R

* Clamp Torque (lbf-in) : TS202=5.3, TS255=8.9

SVJB-SM

Without off set





Right hand tool holder shown.

Finish R/L-F



(2)

Medium R/L-SN



(2)

Medium MV



(2)

Medium R/L-SR



(2)

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	HF	S4	* Insert Screw	Wrench
SVJBR/L-062SM	●	●	VBET VBGT VBMT	22○	.375	.375	4.921	.375	0	TS255	TKY08R
SVJBR/L-082SM	●	●		22○	.500	.500	5.906	.500	0	TS255	TKY08R
SVJBR/L-102SM	●	●		22○	.625	.625	5.906	.625	0	TS255	TKY08R

* Clamp Torque (lbf-in) : TS255=8.9

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

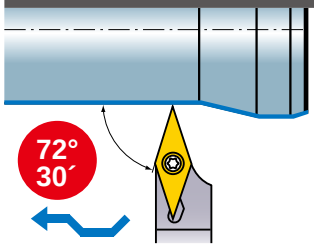
SVLP-SM type inserts	**➤ A169**
SVJB-SM type inserts	**➤ A162–A165**
CBN & PCD inserts	**➤ B044, B060**

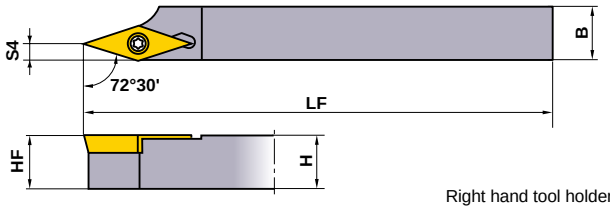
● : **Inventory maintained.**

INCH STANDARD

SVVB-SM

Neutral edge with handed holder





Right hand tool holder shown.

Finish	Medium
R/L-F	R/L-SN
 (2)	 (2)
Medium	**Medium**
MV	R/L-SR
 (2)	 (2)

Order Number	Stock		Insert Number		Dimensions (inch)					*	
	R	L			H	B	LF	HF	S4	Insert Screw	Wrench
SVVBR/L-062SM	●	●	VBET VBGT VBMT	22◌	.375	.375	4.921	.375	.118	TS255	TKY08R
SVVBR/L-082SM	●	●		22◌	.500	.500	5.906	.500	.118	TS255	TKY08R
SVVBR/L-102SM	●	●		22◌	.625	.625	5.906	.625	.118	TS255	TKY08R

* Clamp Torque (lbf-in) : TS255=8.9

SMALL TOOLS

RECOMMENDED CUTTING CONDITIONS

	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF/UE6020**	165—490	.0004—.006
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.006
P		**AP25N**	165—820	.0004—.006
M	Stainless Steel	**VP15TF**	165—395	.0008—.004
N	Non-Ferrous Metal	**HTi10/RT9005**	230—755	.0012—.006

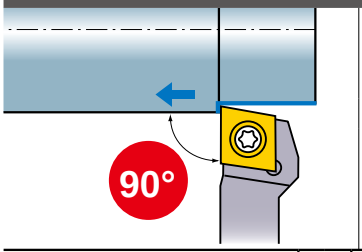
SVVB-SM type inserts ➤ A162—A165
CBN & PCD inserts ➤ B044, B060
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

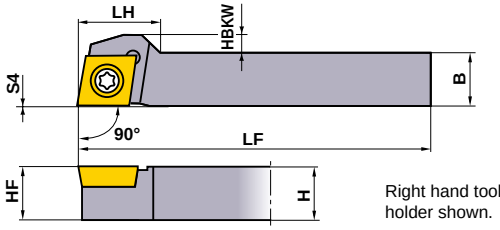
FRONT TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

SCAC-SM

Without off set





Right hand tool holder shown.

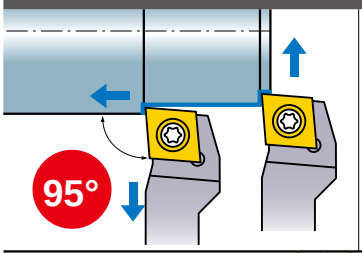
Finish	Finish	Light	Medium
SMG	R/L-F	R/L-SS	R/L-SN
			
(2)	(2)	(2,3)	(2,3)
Medium	**Flat Top**	**Non-Ferrous Metal**	**CBN/PCD**
R/L-SR		AZ	
			
(2,3)	(2,3)	(2,3)	(2,3)

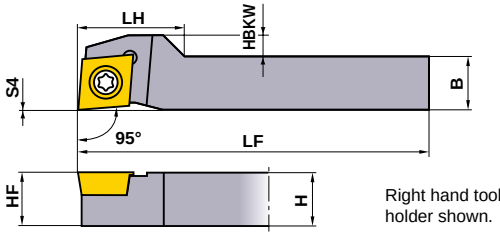
Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H	B	LF	LH	HBKW	HF	S4	Insert Screw	Wrench
SCACR/L0808K06-SM	●	●	CCET CCGT CCGW CCMT CCMW NP-CCGW	21.5°	8	8	125	11	1.6	8	0	TS254	TKY08R
SCACR/L**1010K06-SM**	●	●		21.5°	10	10	125	—	—	10	0	TS254	TKY08R
SCACR/L**1010K09-SM**	●	●		32.5°	10	10	125	16	3.5	10	0	TS43	TKY15R
SCACR/L**1212M09-SM**	●	●		32.5°	12	12	150	14	1.5	12	0	TS43	TKY15R
SCACR/L**1616M09-SM**	●	●		32.5°	16	16	150	—	—	16	0	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

SCLC-SM

Without off set





Right hand tool holder shown.

Finish	Finish	Light	Medium
SMG	R/L-F	R/L-SS	R/L-SN
			
(2)	(2)	(2,3)	(2,3)
Medium	**Flat Top**	**Non-Ferrous Metal**	**CBN/PCD**
R/L-SR		AZ	
			
(2,3)	(2,3)	(2,3)	(2,3)

Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H	B	LF	LH	HBKW	HF	S4	Insert Screw	Wrench
SCLCR/L0808K06-SM	●	●	CCET CCGT CCGW CCMT CCMW NP-CCGW	21.5°	8	8	125	11	2.1	8	0	TS254	TKY08R
SCLCR/L**1010K06-SM**	●	●		21.5°	10	10	125	—	—	10	0	TS254	TKY08R
SCLCR/L**1010K09-SM**	●	●		32.5°	10	10	125	20	4	10	0	TS43	TKY15R
SCLCR/L**1212M09-SM**	●	●		32.5°	12	12	150	18	2	12	0	TS43	TKY15R
SCLCR/L**1616M09-SM**	●	●		32.5°	16	16	150	—	—	16	0	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

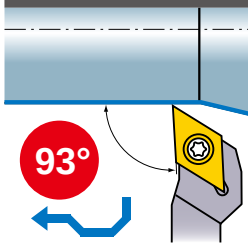
SCAC-SM type inserts	**➤ A136—A141**
SCLC-SM type inserts	**➤ A136—A141**
CBN & PCD inserts	**➤ B036, B037, B055**

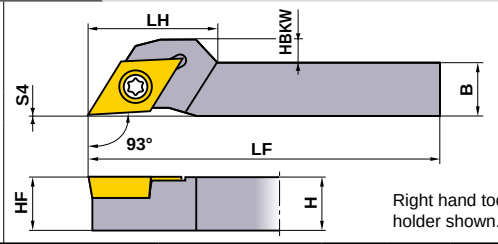
● : **Inventory maintained.**

METRIC STANDARD

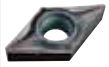
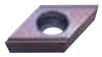
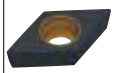
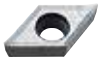
SDJC-SM

Without off set





Right hand tool holder shown.

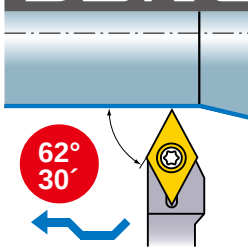
Finish	Finish	Light	Medium
SMG	R-F	R-SS	R-SN
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Flat Top**	**Non-Ferrous Metal**	**CBN/PCD**
R-SR		AZ	
			
(2,3)	(2,3)	(2,3)	(2,3)

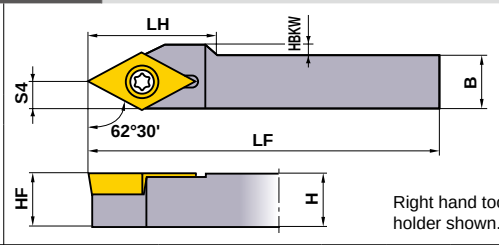
Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H	B	LF	LH	HBKW	HF	S4	Insert Screw	Wrench
SDJCR/L0808K07-SM	●	●	DCET DCGT DCGW DCMT DCMW NP-DCGW NP-DCMT NP-DCMW	21.5°	8	8	125	15	2	8	0	TS254	TKY08R
SDJCR/L**1010K07-SM**	●	●		21.5°	10	10	125	—	—	10	0	TS254	TKY08R
SDJCR/L**1010K11-SM**	●	●		32.5°	10	10	125	24	4	10	0	TS43	TKY15R
SDJCR/L**1212M11-SM**	●	●		32.5°	12	12	150	22	2	12	0	TS43	TKY15R
SDJCR/L**1616M11-SM**	●	●		32.5°	16	16	150	—	—	16	0	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

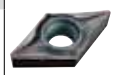
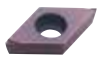
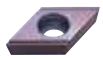
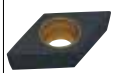
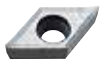
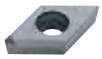
SDNC-SM

Neutral edge with handed holder
Without off set





Right hand tool holder shown.

Finish	Finish	Light	Medium
SMG	R-F	R-SS	R-SN
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Flat Top**	**Non-Ferrous Metal**	**CBN/PCD**
R-SR		AZ	
			
(2,3)	(2,3)	(2,3)	(2,3)

Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H	B	LF	LH	HBKW	HF	S4	Insert Screw	Wrench
SDNCR/L0808K07-SM	●	●	DCET DCGT DCGW DCMT DCMW NP-DCGW NP-DCMT NP-DCMW	21.5°	8	8	125	—	—	8	3	TS254	TKY08R
SDNCR/L**1010K07-SM**	●	●		21.5°	10	10	125	—	—	10	3	TS254	TKY08R
SDNCR/L**1010K11-SM**	●	●		32.5°	10	10	125	24	2	10	5	TS43	TKY15R
SDNCR/L**1212M11-SM**	●	●		32.5°	12	12	150	—	—	12	5	TS43	TKY15R
SDNCR/L**1616M11-SM**	●	●		32.5°	16	16	150	—	—	16	5	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

RECOMMENDED CUTTING CONDITIONS

	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF/UE6020**	165—490	.0004—.006
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.006
P	Free Cutting Carbon Steel	**AP25N**	165—820	.0004—.006
M	Stainless Steel	**VP15TF**	165—395	.0008—.004
N	Non-Ferrous Metal	**HTi10/RT9005**	230—755	.0012—.006

SDJC-SM type inserts ➤ **A144—A149**
SDNC-SM type inserts ➤ **A144—A149**
CBN & PCD inserts ➤ **B039, B040, B056**

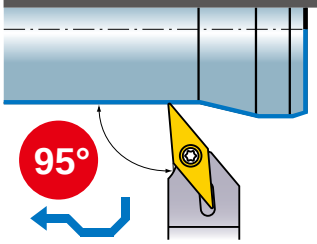
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

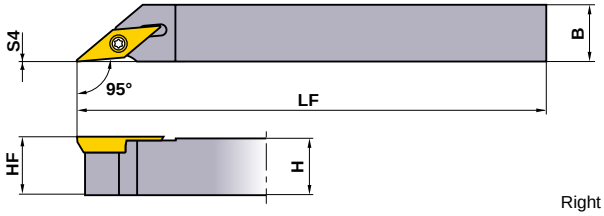
FRONT TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

SVLP-SM

Without off set





Right hand tool holder shown.

Finish
R/L-SRF

(1.5, 2)
Finish
SMG

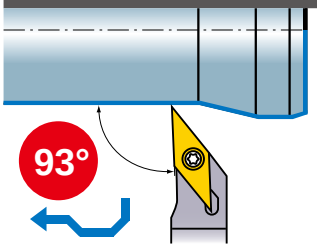
(1.5, 2)

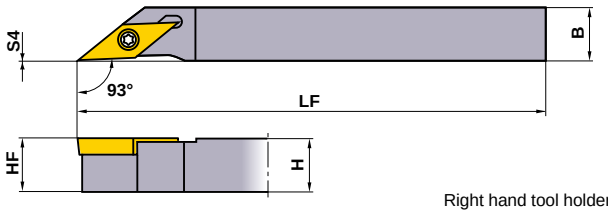
Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	LF	HF	S4	* Insert Screw	Wrench
SVLPR/L1010K08-SM	●	●	VPET VPGT	1.51.5○	10	10	125	10	0	TS202	TKY06R
SVLPR/L**1212M08-SM**	●	●		1.51.5○	12	12	150	12	0	TS202	TKY06R
SVLPR/L**1010K11-SM**	●	●		22○	10	10	125	10	0	TS255	TKY08R
SVLPR/L**1212M11-SM**	●	●		22○	12	12	150	12	0	TS255	TKY08R
SVLPR/L**1616M11-SM**	●	●		22○	16	16	150	16	0	TS255	TKY08R

* Clamp Torque (lbf-in) : TS202=5.3, TS255=8.9

SVJB-SM

Without off set





Right hand tool holder shown.

Finish
R/L-F

(2)
Medium
R/L-SN

(2)
Medium
MV

(2)
Medium
R/L-SR

(2)

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	LF	HF	S4	* Insert Screw	Wrench
SVJBR/L1010K11-SM	●	●	VBET VBGT VBMT	22○	10	10	125	10	0	TS255	TKY08R
SVJBR/L**1212M11-SM**	●	●		22○	12	12	150	12	0	TS255	TKY08R
SVJBR/L**1616M11-SM**	●	●		22○	16	16	150	16	0	TS255	TKY08R

* Clamp Torque (lbf-in) : TS255=8.9

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

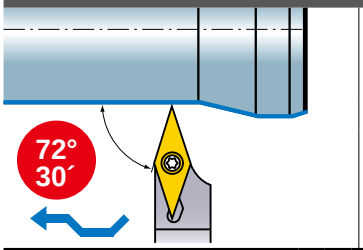
SVLP-SM type inserts	**➤ A169**
SVJB-SM type inserts	**➤ A162–A165**
CBN & PCD inserts	**➤ B044, B060**

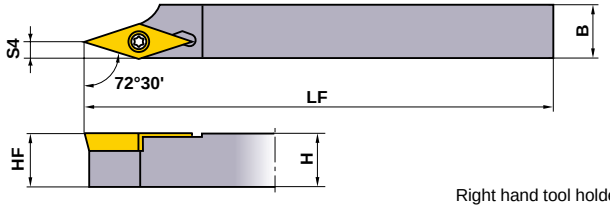
● : **Inventory maintained.**

METRIC STANDARD

SVVB-SM

Neutral edge with handed holder





Right hand tool holder shown.

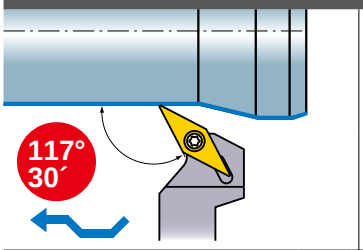
Finish	Medium
R/L-F	R/L-SN
	
(2)	(2)
Medium	**Medium**
MV	R/L-SR
	
(2)	(2)

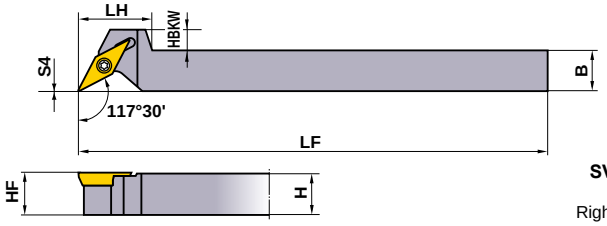
Order Number	Stock		Insert Number		Dimensions (mm)					*	
	R	L			H	B	LF	HF	S4	Insert Screw	Wrench
SVVBR/L1010K11-SM	●	●	VBET VBGT VBMT	22◌	10	10	125	10	3	TS255	TKY08R
SVVBR/L**1212M11-SM**	●	●		22◌	12	12	150	12	3	TS255	TKY08R
SVVBR/L**1616M11-SM**	●	●		22◌	16	16	150	16	3	TS255	TKY08R

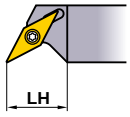
* Clamp Torque (lbf-in) : TS255=8.9

SVPP-SM

Neutral edge with handed holder







SVPPR/L1616M11-SM

Right hand tool holder shown.

Finish
R/L-SRF

(2)
Finish
SMG

(2)

Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H	B	LF	LH	HBKW	HF	S4	Insert Screw	Wrench
SVPPR/L1010K11-SM	●	●	VPET VPGT	22◌	10	10	125	20	8	10	0	TS255	TKY08R
SVPPR/L**1212M11-SM**	●	●		22◌	12	12	150	20	6	12	0	TS255	TKY08R
SVPPR/L**1616M11-SM**	●	●		22◌	16	16	150	17	–	16	0	TS255	TKY08R

* Clamp Torque (lbf-in) : TS255=8.9

RECOMMENDED CUTTING CONDITIONS

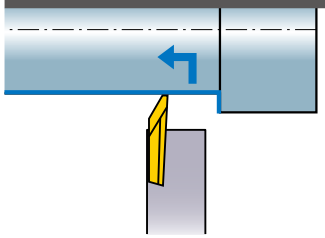
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF/UE6020**	165—490	.0004—.006
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.006
P		**AP25N**	165—820	.0004—.006
M	Stainless Steel	**VP15TF**	165—395	.0008—.004
N	Non-Ferrous Metal	**HTi10/RT9005**	230—755	.0012—.006

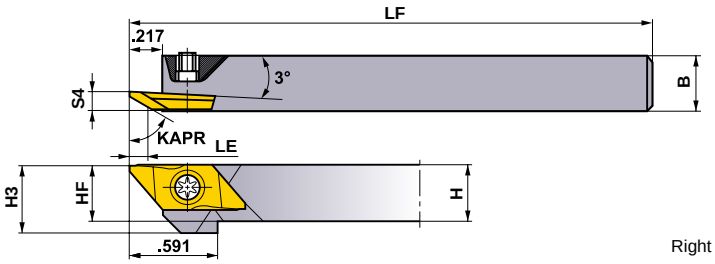
SVVB-SM type inserts ➤ **A162—A165**
SVPP-SM type inserts ➤ **A169**
CBN & PCD inserts ➤ **B044, B060**
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

BACK TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

BTAH





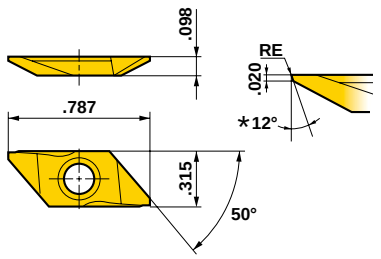
Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)						*	
	R	L			H	B	LF	HF	H3	S4	Insert Screw	Wrench
BTAHR/L-062	●	●	BTAT	5528□□R/L-B	.375	.375	4.724	.375	.500	.138	NS402W	NKY15R
BTAHR/L-082	●	●		6035□□R/L-B	.500	.500	4.724	.500	—	.138	NS403W	NKY15R
BTAHR/L-102	●			605000RX	.625	.625	4.724	.625	—	.138	NS403W	NKY15R

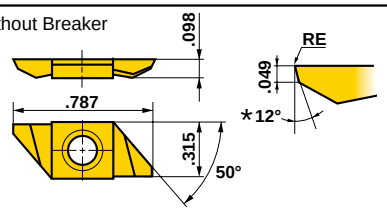
(Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
(Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length (LE).
* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

INSERTS

Order Number	Hand	Coated	Dimensions (inch)			Geometry
		VP15TF	KAPR*	RE	LE*	
BTAT552800R-B	R	●	55°	0	.110	With Breaker
BTAT552800L-B	L	●	55°	0	.110	
BTAT552801R-B	R	●	55°	.004	.110	
BTAT552801L-B	L	●	55°	.004	.110	
BTAT603500R-B	R	●	60°	0	.138	
BTAT603500L-B	L	●	60°	0	.138	
BTAT603501R-B	R	●	60°	.004	.138	
BTAT603501L-B	L	●	60°	.004	.138	
BTAT605000RX	R	●	60°	0	.197	Without Breaker



Right hand insert shown.

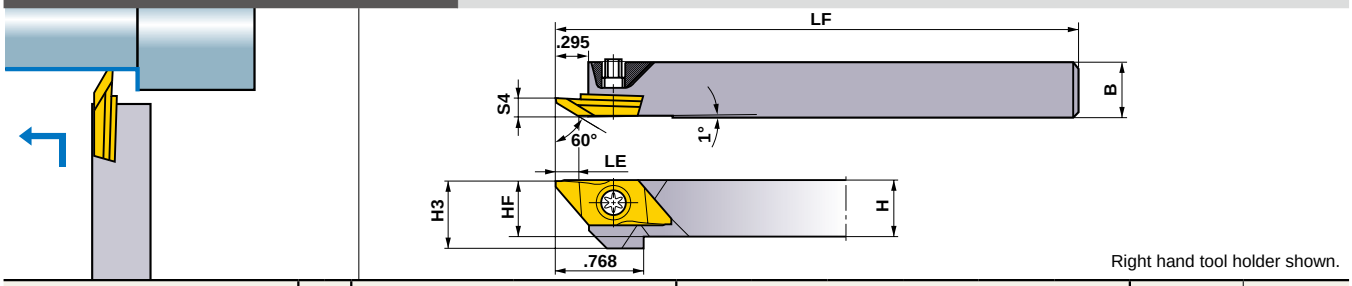


* Numeric value set insert on holder.

● : Inventory maintained. (5 inserts in one case)

INCH STANDARD

CTBH



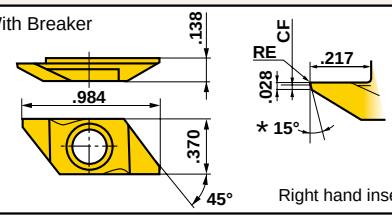
Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)						*	
	R	L			H	B	LF	HF	H3	S4	Insert Screw	Wrench
CTBHR/L-062	●	●	BTBT	60450□R/L-B 606000R/L	.375	.375	4.724	.375	.500	.133	NS402W	NKY15R
CTBHR/L**-082**	●	●			.500	.500	4.724	.500	—	.133	NS403W	NKY15R
CTBHR/L**-102**	●	●			.625	.625	4.724	.625	—	.133	NS403W	NKY15R

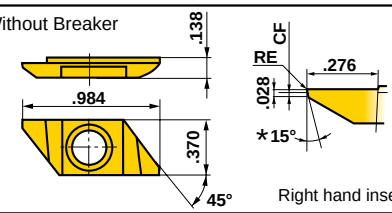
(Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
(Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length (LE).
* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

INSERTS

Order Number	Hand	Coated	Dimensions (inch)		LE * (inch)	Geometry
		VP15TF	RE*	CF		
BTBT604500R-B	R	●	0	.008	.177	With Breaker
BTBT**604500L-B**	L	●	0	.008	.177	
BTBT**604501R-B**	R	●	.004	.012	.177	
BTBT**604501L-B**	L	●	.004	.012	.177	
BTBT606000R	R	●	0	.008	.236	Without Breaker
BTBT**606000L**	L	●	0	.008	.236	



Right hand insert shown.



Right hand insert shown.

* Numeric value set insert on holder.

RECOMMENDED CUTTING CONDITIONS

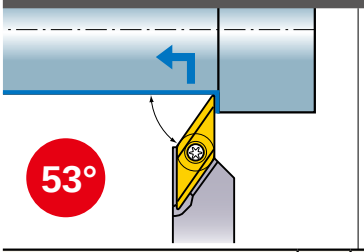
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF**	165—490	.0004—.006
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.006
M	Stainless Steel	**VP15TF**	165—395	.0008—.004
N	Non-Ferrous Metal	**VP15TF**	230—755	.0012—.006

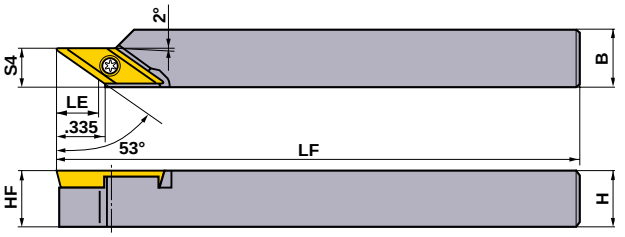
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

BACK TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

BTVH





Right hand tool holder only.

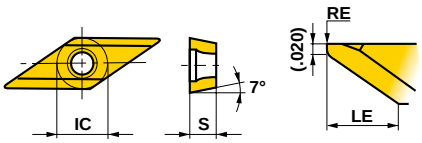
Order Number	Stock	Insert Number		Dimensions (inch)					*	
	R			H	B	LF	HF	S4	Insert Screw	Wrench
BTVHR-062	●	BTVT	5375◌◌R-B	.375	.375	4.724	.375	.295	NS251	NKY15R
BTVHR**-082**	●			.500	.500	4.724	.500	.295	NS251	NKY15R
BTVHR**-102**	●			.625	.625	4.724	.625	.295	NS251	NKY15R

(Note) Set the maximum depth of cut at under 30% of the effective cutting edge length (LE).

* Clamp Torque (lbf-in) : NS251=6.2

INSERTS

Order Number	Hand	Coated	Dimensions (inch)			LE (inch)	Geometry
		VP15TF	IC	S	RE		
BTVT5375V5R-B	R	●	.250	.125	.002	.295	With Breaker
BTVT**537501R-B**	R	●	.250	.125	.004	.295	

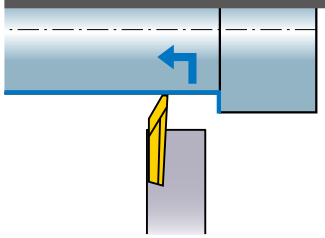


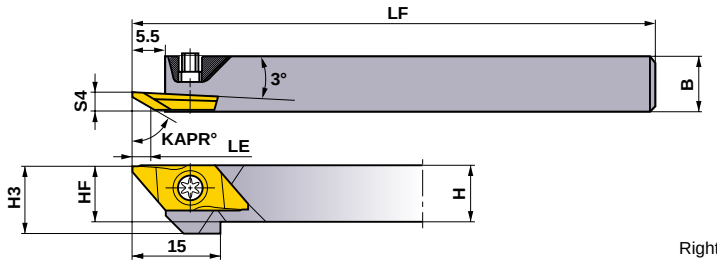
* Numeric value set insert on holder.

● : Inventory maintained. (5 inserts in one case)

METRIC STANDARD

BTAH





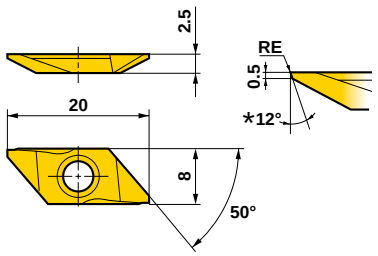
Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	LF	HF	H3	S4	* Insert Screw	Wrench
BTAHR/L0810-50	●	●	BTAT	5528○○R/L-B 6035○○R/L-B 605000RX	8	10	120	8	12	3.5	NS402W	NKY15R
BTAHR/L**1010-50**	●	●			10	10	120	10	12	3.5	NS402W	NKY15R
BTAHR/L**1212-50**	●	●			12	12	120	12	—	3.5	NS403W	NKY15R
BTAHR/L**1616-50**	●				16	16	120	16	—	3.5	NS403W	NKY15R

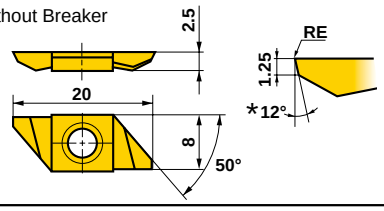
(Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
(Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length (LE).
* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

INSERTS

Order Number	Hand	Coated VP15TF	Dimensions (mm) KAPR *	RE	LE *	Geometry
BTAT552800R-B	R	●	55°	0	2.8	With Breaker
BTAT**552800L-B**	L	●	55°	0	2.8	
BTAT**552801R-B**	R	●	55°	0.1	2.8	
BTAT**552801L-B**	L	●	55°	0.1	2.8	
BTAT**603500R-B**	R	●	60°	0	3.5	
BTAT**603500L-B**	L	●	60°	0	3.5	
BTAT**603501R-B**	R	●	60°	0.1	3.5	
BTAT**603501L-B**	L	●	60°	0.1	3.5	
BTAT605000RX	R	●	60°	0	5.0	Without Breaker



Right hand insert shown.



* Numeric value set insert on holder.

RECOMMENDED CUTTING CONDITIONS

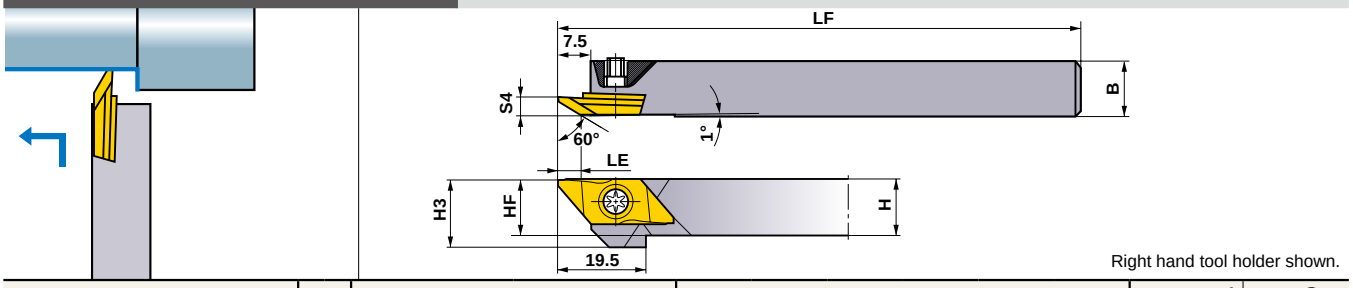
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF**	165—490	.0004—.006
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.006
M	Stainless Steel	**VP15TF**	165—395	.0008—.004
N	Non-Ferrous Metal	**VP15TF**	230—755	.0012—.006

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

BACK TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

CTBH



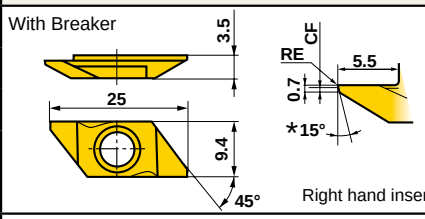
Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	LF	HF	H3	S4	* Insert Screw	Wrench
CTBHR/L1010-160	●	●	BTBT	60450□R/L-B 606000R/L	10	10	120	10	12	3.4	NS402W	NKY15R
CTBHR/L**1212-160**	●	●			12	12	120	12	—	3.4	NS403W	NKY15R
CTBHR/L**1616-160**	●	●			16	16	120	16	—	3.4	NS403W	NKY15R

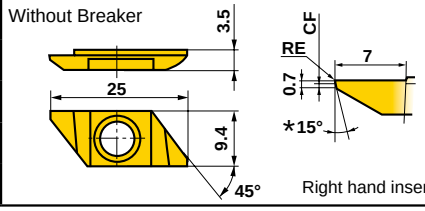
(Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
(Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length (LE).
* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

INSERTS

Order Number	Hand	Coated VP15TF	Dimensions (mm) RE*	CF	LE* (mm)	Geometry
BTBT604500R-B	R	●	0	0.2	4.5	With Breaker
BTBT**604500L-B**	L	●	0	0.2	4.5	
BTBT**604501R-B**	R	●	0.1	0.3	4.5	
BTBT**604501L-B**	L	●	0.1	0.3	4.5	
BTBT606000R	R	●	0	0.2	6.0	Without Breaker
BTBT**606000L**	L	●	0	0.2	6.0	



Right hand insert shown.



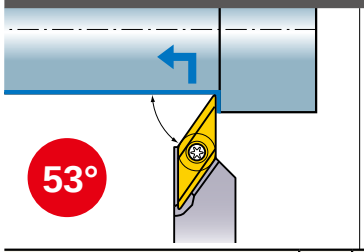
Right hand insert shown.

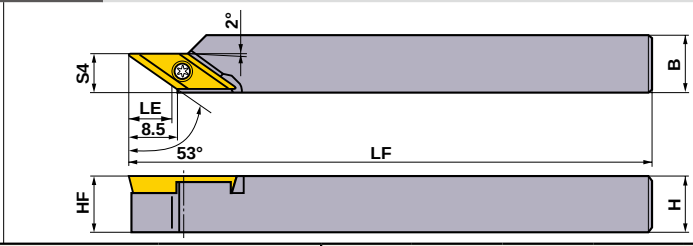
* Numeric value set insert on holder.

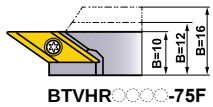
● : Inventory maintained. (5 inserts in one case)

METRIC STANDARD

BTVH







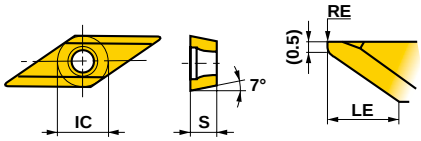
Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)					*	
	R			H	B	LF	HF	S4	Insert Screw	Wrench
BTVHR1010-75	●	BTVT	5375□□R-B	10	10	120	10	7.5	NS251	NKY15R
BTVHR**1212-75**	●			12	12	120	12	7.5	NS251	NKY15R
BTVHR**1616-75**	●			16	16	120	16	7.5	NS251	NKY15R
BTVHR**1010-75F**	●			10	10	120	10	10.0	NS251	NKY15R
BTVHR**1212-75F**	●			12	12	120	12	10.0	NS251	NKY15R
BTVHR**1616-75F**	●			16	16	120	16	10.0	NS251	NKY15R

(Note 1) Set the maximum depth of cut at under 30% of the effective cutting edge length (LE).
(Note 2) For high load machining, F type is recommended.
* Clamp Torque (lbf-in) : NS251=6.2

INSERTS

Order Number	Hand	Coated	Dimensions (mm)			LE (mm)	Geometry
		VP15TF	IC	S	RE		
BTVT5375V5R-B	R	●	6.35	3.18	0.05	7.5	With Breaker
BTVT**537501R-B**	R	●	6.35	3.18	0.1	7.5	



* Numeric value set insert on holder.

RECOMMENDED CUTTING CONDITIONS

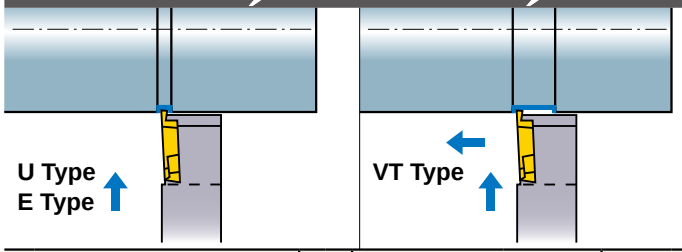
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF**	165—490	.0004—.006
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.006
M	Stainless Steel	**VP15TF**	165—395	.0008—.004
N	Non-Ferrous Metal	**VP15TF**	230—755	.0012—.006

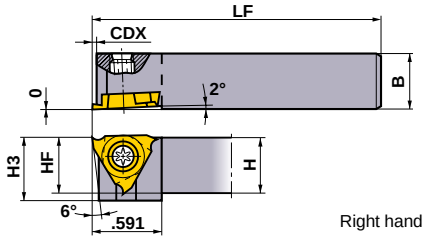
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

GROOVING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

GTAH, GTBH, GTCH





Right hand tool holder shown.

Order Number		Stock R	Stock L	Insert Number		Dimensions (inch) H	B	HF	LF	CDX*1	H3	Cutting Width (inch)	*2 Insert Screw	Wrench
Long Shank	**GTBHR/L-063**	●	●	GTAT GTBT GTCT	○○○○	.375	.375	.375	4.724	.118	.531	.057–.118	NS404W	NKY15R
Long Shank	GTBHR/L**-083**	●	●	GTAT GTBT GTCT	○○○○	.500	.500	.500	4.724	.118	.520	.057–.118	NS404W	NKY15R
Long Shank	GTBHR/L**-103**	●	●	GTAT GTBT GTCT	○○○○	.625	.625	.625	4.724	.118	—	.057–.118	NS404W	NKY15R

(Note) Please use right hand insert for right hand holder and left hand insert for left hand holder.

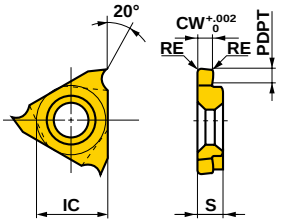
*1 If the insert dimension PDPT exceeds the holder dimension CDX, it is impossible to machine the depths over CDX.

*2 Clamp Torque (lbf-in) : NS404W=6.2

INSERTS

Order Number	Hand	Coated VP15TF	Dimensions (inch) CW	PDPT*1	RE	IC	S
GTAT03006V3R-U	R	●	.012	.024	.001	.375	.125
GTAT**03006V3L-U**	L	●	.012	.024	.001	.375	.125
GTAT**05012V5R-U**	R	●	.020	.047	.002	.375	.125
GTAT**05012V5L-U**	L	●	.020	.047	.002	.375	.125
GTAT**07520V5R-U**	R	●	.030	.079	.002	.375	.125
GTAT**07520V5L-U**	L	●	.030	.079	.002	.375	.125
GTAT**09520V5R-U**	R	●	.037	.079	.002	.375	.125
GTAT**09520V5L-U**	L	●	.037	.079	.002	.375	.125
GTAT**10020V5R-U**	R	●	.039	.079	.002	.375	.125
GTAT**10020V5L-U**	L	●	.039	.079	.002	.375	.125
GTAT**10320V5R-U**	R	●	.041	.079	.002	.375	.125
GTAT**12520V5R-U**	R	●	.049	.079	.002	.375	.125
GTAT**12520V5L-U**	L	●	.049	.079	.002	.375	.125
GTBT14530V5R-U	R	●	.057	.118	.002	.375	.125
GTBT**14530V5L-U**	L	●	.057	.118	.002	.375	.125
GTBT**15030V5R-U**	R	●	.059	.118	.002	.375	.125
GTBT**15030V5L-U**	L	●	.059	.118	.002	.375	.125
GTBT**17530V5R-U**	R	●	.069	.118	.002	.375	.125
GTBT**17530V5L-U**	L	●	.069	.118	.002	.375	.125
GTBT**20030V5R-U**	R	●	.079	.118	.002	.375	.125
GTBT**20030V5L-U**	L	●	.079	.118	.002	.375	.125
GTCT25030V5R-U	R	●	.098	.118	.002	.375	.125
GTCT**25030V5L-U**	L	●	.098	.118	.002	.375	.125

U Type Breaker (Grooving)
For general use

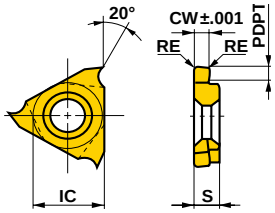


Right hand insert shown.

● : Inventory maintained. □ : Non stock, produced to order only.
(5 inserts in one case)

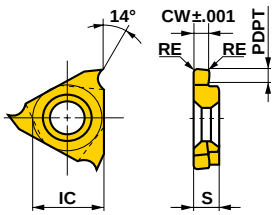
INSERTS

Order Number	Hand	Coated		Dimensions (inch)					Geometry
		VP15TF	VP15KZ	CW	PDPT	RE	IC	S	
GTAT03306V3R-E	R	●		.013	.024	.001	.375	.125	**E** Type Breaker (Grooving) For precision cutting
GTAT03306V3L-E	L	●		.013	.024	.001	.375	.125	
GTAT04312V3R-E	R	●		.017	.047	.001	.375	.125	
GTAT04312V3L-E	L	●		.017	.047	.001	.375	.125	
GTAT05312V5R-E	R	●		.021	.047	.002	.375	.125	
GTAT05312V5L-E	L	●		.021	.047	.002	.375	.125	
GTAT07520V5R-E	R	●		.030	.079	.002	.375	.125	
GTAT07520V5L-E	L	●		.030	.079	.002	.375	.125	
GTAT09520V5R-E	R	●		.037	.079	.002	.375	.125	
GTAT09520V5L-E	L	●		.037	.079	.002	.375	.125	
GTAT10020V5R-E	R	●		.039	.079	.002	.375	.125	
GTAT10020V5L-E	L	●		.039	.079	.002	.375	.125	
GTAT1002001R-E	R	●		.039	.079	.004	.375	.125	
GTAT1002001L-E	L	●		.039	.079	.004	.375	.125	
GTAT12020V5R-E	R	●		.047	.079	.002	.375	.125	
GTAT12020V5L-E	L	●		.047	.079	.002	.375	.125	
GTAT1202001R-E	R	●		.047	.079	.004	.375	.125	
GTAT1202001L-E	L	●		.047	.079	.004	.375	.125	
GTAT14020V5R-E	R	●		.055	.079	.002	.375	.125	
GTAT14020V5L-E	L	●		.055	.079	.002	.375	.125	
GTBT15030V5R-E	R	●		.059	.118	.002	.375	.125	
GTBT15030V5L-E	L	●		.059	.118	.002	.375	.125	
GTBT1503001R-E	R	●		.059	.118	.004	.375	.125	
GTBT1503001L-E	L	●		.059	.118	.004	.375	.125	
GTBT18030V5R-E	R	●		.071	.118	.002	.375	.125	
GTBT18030V5L-E	L	●		.071	.118	.002	.375	.125	
GTBT20030V5R-E	R	●		.079	.118	.002	.375	.125	
GTBT20030V5L-E	L	●		.079	.118	.002	.375	.125	
GTBT2003001R-E	R	●		.079	.118	.004	.375	.125	
GTBT2003001L-E	L	●		.079	.118	.004	.375	.125	
GTBT22530V5R-E	R	●		.089	.118	.002	.375	.125	
GTBT22530V5L-E	L	●		.089	.118	.002	.375	.125	
GTCT25030V5R-E	R	●		.098	.118	.002	.375	.125	
GTCT25030V5L-E	L	●		.098	.118	.002	.375	.125	
GTCT27530V5R-E	R	●		.108	.118	.002	.375	.125	
GTCT27530V5L-E	L	●		.108	.118	.002	.375	.125	
GTCT30030V5R-E	R	●		.118	.118	.002	.375	.125	
GTCT30030V5L-E	L	●		.118	.118	.002	.375	.125	



Right hand insert shown.

Order Number	Hand	Coated		Dimensions (inch)					Max. Depth of Cut (inch)	Geometry
		VP15TF	VP15KZ	CW	PDPT	RE	IC	S		
GTAT0330600R-VT	R		●	.013	.024	0	.375	.125	.010	**VT** Type Breaker (Grooving, Profiling)
GTAT0431200R-VT	R		●	.017	.047	0	.375	.125	.035	
GTAT0532000R-VT	R		●	.021	.079	0	.375	.125	.063	
GTAT0652000R-VT	R		●	.026	.079	0	.375	.125	.063	
GTAT0752000R-VT	R		●	.030	.079	0	.375	.125	.063	
GTAT0802000R-VT	R		●	.031	.079	0	.375	.125	.063	
GTAT0852000R-VT	R		●	.033	.079	0	.375	.125	.063	
GTAT0952000R-VT	R		●	.037	.079	0	.375	.125	.063	
GTAT1002000R-VT	R		●	.039	.079	0	.375	.125	.063	
GTAT1102000R-VT	R		●	.043	.079	0	.375	.125	.063	
GTAT1202000R-VT	R		●	.047	.079	0	.375	.125	.063	
GTAT1302000R-VT	R		●	.051	.079	0	.375	.125	.063	
GTAT1402000R-VT	R		●	.055	.079	0	.375	.125	.063	
GTBT1503000R-VT	R		●	.059	.118	0	.375	.125	.106	
GTBT2003000R-VT	R		●	.079	.118	0	.375	.125	.106	



RECOMMENDED CUTTING CONDITIONS

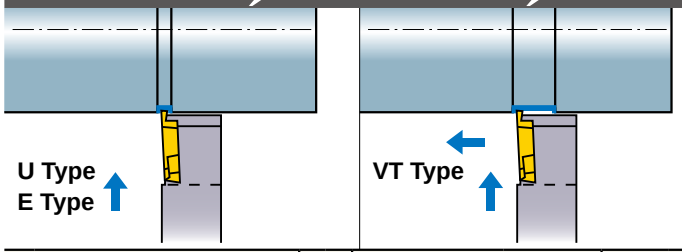
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF/VP15KZ**	165—490	.0004—.0035
P	Free Cutting Carbon Steel	**VP15TF/VP15KZ**	100—590	.0004—.0035
M	Stainless Steel	**VP15TF/VP15KZ**	165—395	.0008—.002
N	Non-Ferrous Metal	**VP15TF/VP15KZ**	230—755	.0012—.004

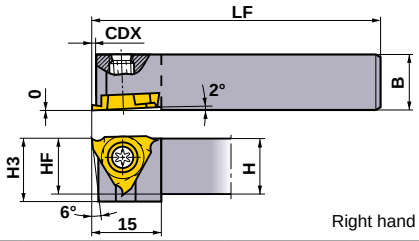
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

GROOVING TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

GTAH, GTBH, GTCH





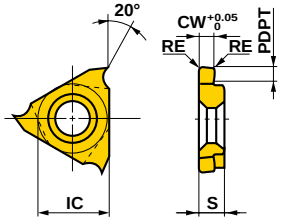
Right hand tool holder shown.

Order Number		Stock R	Stock L	Insert Number		Dimensions (mm) H	B	HF	LF	CDX*1	H3	Cutting Width (mm)	*2 Insert Screw	Wrench
Standard Shank	**GTAHR/L0808-20S**	★	★	GTAT GTBT*1 GTCT*1		8	8	8	80	2	13	0.3—3.0	NS404W	NKY15R
	GTAHR/L**1010-20S**	★	★			10	10	10	80	2	13	0.3—3.0	NS404W	NKY15R
	GTAHR/L**1212-20S**	★	★			12	12	12	80	2	13	0.3—3.0	NS404W	NKY15R
	GTBHR/L1010-30S	★	★	GTBT. GTCT		10	10	10	80	3	13	1.45—3.0	NS404W	NKY15R
	GTCHR/L1010-30S	★	★	GTCT		10	10	10	80	3	13	2.5—3.0	NS404W	NKY15R
Long Shank	**GTAHR/L0808-20**	★	★	GTAT GTBT*1 GTCT*1		8	8	8	120	2	13	0.3—3.0	NS404W	NKY15R
	GTAHR/L**1010-20**	★	★			10	10	10	120	2	13	0.3—3.0	NS404W	NKY15R
	GTAHR/L**1212-20**	★	★			12	12	12	120	2	13	0.3—3.0	NS404W	NKY15R
	GTAHR/L**1616-20**	★	★			16	16	16	120	2	—	0.3—3.0	NS404W	NKY15R
	GTBHR/L1010-30	●	●	GTBT. GTCT		10	10	10	120	3	13	1.45—3.0	NS404W	NKY15R
	GTBHR/L**1212-30**	●	●			12	12	12	120	3	13	1.45—3.0	NS404W	NKY15R
	GTBHR/L**1616-30**	●	●			16	16	16	120	3	16	1.45—3.0	NS404W	NKY15R
	GTCHR/L1010-30	★	★	GTCT		10	10	10	120	3	13	2.5—3.0	NS404W	NKY15R

(Note) Please use right hand insert for right hand holder and left hand insert for left hand holder.
*1 If the insert dimension PDPT exceeds the holder dimension CDX, it is impossible to machine the depths over CDX.
*2 Clamp Torque (lbf-in) : NS404W=6.2

INSERTS

Order Number	Hand	Coated VP15TF	Dimensions (mm) CW	PDPT*1	RE	IC	S	Geometry (mm)
GTAT03006V3R-U	R	●	0.3	0.6	0.03	9.525	3.18	**U** Type Breaker (Grooving) For general use
GTAT**03006V3L-U**	L	●	0.3	0.6	0.03	9.525	3.18	
GTAT**05012V5R-U**	R	●	0.5	1.2	0.05	9.525	3.18	
GTAT**05012V5L-U**	L	●	0.5	1.2	0.05	9.525	3.18	
GTAT**07520V5R-U**	R	●	0.75	2.0	0.05	9.525	3.18	
GTAT**07520V5L-U**	L	●	0.75	2.0	0.05	9.525	3.18	
GTAT**09520V5R-U**	R	●	0.95	2.0	0.05	9.525	3.18	
GTAT**09520V5L-U**	L	●	0.95	2.0	0.05	9.525	3.18	
GTAT**10020V5R-U**	R	●	1.0	2.0	0.05	9.525	3.18	
GTAT**10020V5L-U**	L	●	1.0	2.0	0.05	9.525	3.18	
GTAT**10320V5R-U**	R	●	1.03	2.0	0.05	9.525	3.18	
GTAT**12520V5R-U**	R	●	1.25	2.0	0.05	9.525	3.18	
GTAT**12520V5L-U**	L	●	1.25	2.0	0.05	9.525	3.18	
GTBT14530V5R-U	R	●	1.45	3.0	0.05	9.525	3.18	
GTBT**14530V5L-U**	L	●	1.45	3.0	0.05	9.525	3.18	
GTBT**15030V5R-U**	R	●	1.5	3.0	0.05	9.525	3.18	
GTBT**15030V5L-U**	L	●	1.5	3.0	0.05	9.525	3.18	
GTBT**17530V5R-U**	R	●	1.75	3.0	0.05	9.525	3.18	
GTBT**17530V5L-U**	L	●	1.75	3.0	0.05	9.525	3.18	
GTBT**20030V5R-U**	R	●	2.0	3.0	0.05	9.525	3.18	
GTBT**20030V5L-U**	L	●	2.0	3.0	0.05	9.525	3.18	
GTCT25030V5R-U	R	●	2.5	3.0	0.05	9.525	3.18	
GTCT**25030V5L-U**	L	●	2.5	3.0	0.05	9.525	3.18	



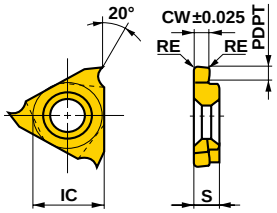
Right hand insert shown.

● : Inventory maintained. ★ : Inventory maintained in Japan.
(5 inserts in one case)

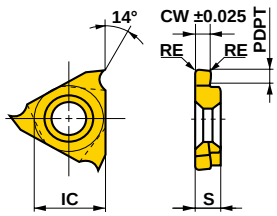
INSERTS

Order Number	Hand	Coated		Dimensions (mm)					Geometry
		VP15TF	VP15KZ	CW	PDPT	RE	IC	S	
GTAT03306V3R-E	R	●		0.33	0.6	0.03	9.525	3.18	**E** Type Breaker (Grooving) For precision cutting
GTAT03306V3L-E	L	●		0.33	0.6	0.03	9.525	3.18	
GTAT04312V3R-E	R	●		0.43	1.2	0.03	9.525	3.18	
GTAT04312V3L-E	L	●		0.43	1.2	0.03	9.525	3.18	
GTAT05312V5R-E	R	●		0.53	1.2	0.05	9.525	3.18	
GTAT05312V5L-E	L	●		0.53	1.2	0.05	9.525	3.18	
GTAT07520V5R-E	R	●		0.75	2.0	0.05	9.525	3.18	
GTAT07520V5L-E	L	●		0.75	2.0	0.05	9.525	3.18	
GTAT09520V5R-E	R	●		0.95	2.0	0.05	9.525	3.18	
GTAT09520V5L-E	L	●		0.95	2.0	0.05	9.525	3.18	
GTAT10020V5R-E	R	●		1.0	2.0	0.05	9.525	3.18	
GTAT10020V5L-E	L	●		1.0	2.0	0.05	9.525	3.18	
GTAT1002001R-E	R	●		1.0	2.0	0.1	9.525	3.18	
GTAT1002001L-E	L	●		1.0	2.0	0.1	9.525	3.18	
GTAT12020V5R-E	R	●		1.2	2.0	0.05	9.525	3.18	
GTAT12020V5L-E	L	●		1.2	2.0	0.05	9.525	3.18	
GTAT1202001R-E	R	●		1.2	2.0	0.1	9.525	3.18	
GTAT1202001L-E	L	●		1.2	2.0	0.1	9.525	3.18	
GTAT14020V5R-E	R	●		1.4	2.0	0.05	9.525	3.18	
GTAT14020V5L-E	L	●		1.4	2.0	0.05	9.525	3.18	
GTBT15030V5R-E	R	●		1.5	3.0	0.05	9.525	3.18	
GTBT15030V5L-E	L	●		1.5	3.0	0.05	9.525	3.18	
GTBT1503001R-E	R	●		1.5	3.0	0.1	9.525	3.18	
GTBT1503001L-E	L	●		1.5	3.0	0.1	9.525	3.18	
GTBT18030V5R-E	R	●		1.8	3.0	0.05	9.525	3.18	
GTBT18030V5L-E	L	●		1.8	3.0	0.05	9.525	3.18	
GTBT20030V5R-E	R	●		2.0	3.0	0.05	9.525	3.18	
GTBT20030V5L-E	L	●		2.0	3.0	0.05	9.525	3.18	
GTBT2003001R-E	R	●		2.0	3.0	0.1	9.525	3.18	
GTBT2003001L-E	L	●		2.0	3.0	0.1	9.525	3.18	
GTBT22530V5R-E	R	●		2.25	3.0	0.05	9.525	3.18	
GTBT22530V5L-E	L	●		2.25	3.0	0.05	9.525	3.18	
GTCT25030V5R-E	R	●		2.5	3.0	0.05	9.525	3.18	
GTCT25030V5L-E	L	●		2.5	3.0	0.05	9.525	3.18	
GTCT27530V5R-E	R	●		2.75	3.0	0.05	9.525	3.18	
GTCT27530V5L-E	L	●		2.75	3.0	0.05	9.525	3.18	
GTCT30030V5R-E	R	●		3.0	3.0	0.05	9.525	3.18	
GTCT30030V5L-E	L	●		3.0	3.0	0.05	9.525	3.18	
GTAT0330600R-VT	R		●	0.33	0.6	0	9.525	3.18	0.25	**VT** Type Breaker (Grooving, Profiling)
GTAT0431200R-VT	R		●	0.43	1.2	0	9.525	3.18	0.9	
GTAT0532000R-VT	R		●	0.53	2.0	0	9.525	3.18	1.6	
GTAT0652000R-VT	R		●	0.65	2.0	0	9.525	3.18	1.6	
GTAT0752000R-VT	R		●	0.75	2.0	0	9.525	3.18	1.6	
GTAT0802000R-VT	R		●	0.8	2.0	0	9.525	3.18	1.6	
GTAT0852000R-VT	R		●	0.85	2.0	0	9.525	3.18	1.6	
GTAT0952000R-VT	R		●	0.95	2.0	0	9.525	3.18	1.6	
GTAT1002000R-VT	R		●	1.0	2.0	0	9.525	3.18	1.6	
GTAT1102000R-VT	R		●	1.1	2.0	0	9.525	3.18	1.6	
GTAT1202000R-VT	R		●	1.2	2.0	0	9.525	3.18	1.6	
GTAT1302000R-VT	R		●	1.3	2.0	0	9.525	3.18	1.6	
GTAT1402000R-VT	R		●	1.4	2.0	0	9.525	3.18	1.6	
GTBT1503000R-VT	R		●	1.5	3.0	0	9.525	3.18	2.7	
GTBT2003000R-VT	R		●	2.0	3.0	0	9.525	3.18	2.7	

Max. Depth of Cut (mm)



Right hand insert shown.



RECOMMENDED CUTTING CONDITIONS

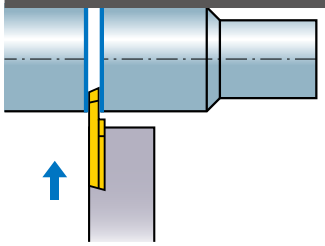
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF/VP15KZ**	165—490	.0004—.0035
P	Free Cutting Carbon Steel	**VP15TF/VP15KZ**	100—590	.0004—.0035
M	Stainless Steel	**VP15TF/VP15KZ**	165—395	.0008—.002
N	Non-Ferrous Metal	**VP15TF/VP15KZ**	230—755	.0012—.004

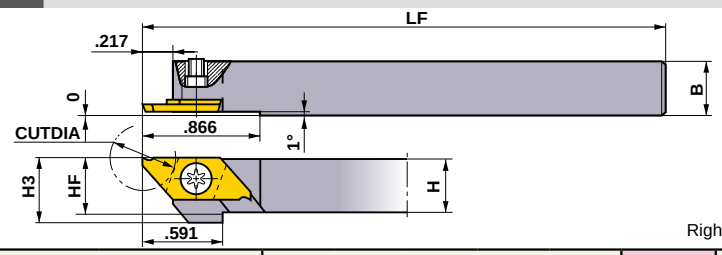
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

CUTTING OFF TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

CTAH



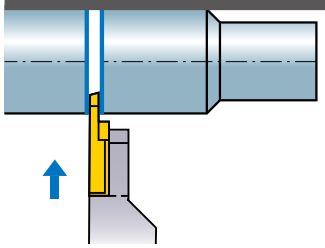


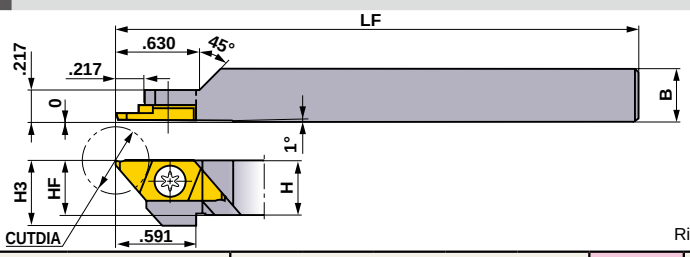
Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	HF	LF	H3	CUTDIA (inch)	✶2 Insert Screw	✶2 Wrench
CTAHR/L-062	●	●	CTAT	○○○○	.375	.375	.375	4.724	.500	.472 (.315)✶1	NS402W	NKY15R
CTAHR/L**-082**	●	●		○○○○	.500	.500	.500	4.724	—		NS403W	NKY15R
CTAHR/L**-102**	●	●		○○○○	.625	.625	.625	4.724	—		NS403W	NKY15R

✶1 When the width of cutting off (CW) is .028inch.
✶2 Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

CTAH-S





Right hand tool holder only.

Order Number	Stock R	Insert Number		Dimensions (inch) H	B	HF	LF	H3	CUTDIA (inch)	✶2 Insert Screw	✶2 Wrench
CTAHR-062S	●	CTAT	○○○○	.375	.375	.375	3.150	.500	.472 (.315)✶1	NS401	NKY25R
CTAHR**-082S**	●		○○○○	.500	.500	.500	3.150	—		NS401	NKY25R

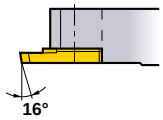
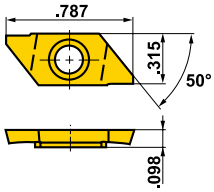
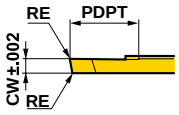
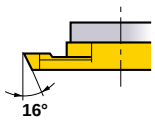
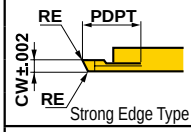
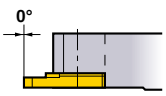
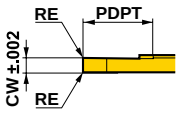
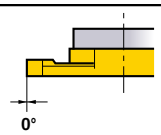
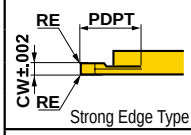
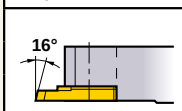
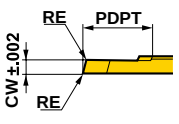
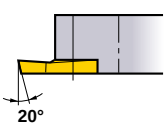
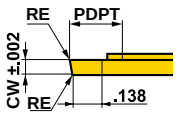
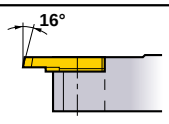
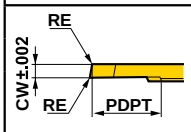
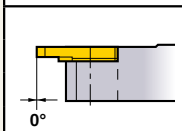
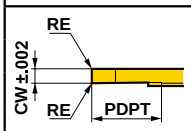
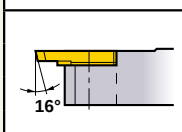
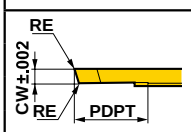
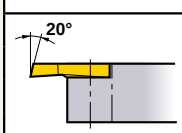
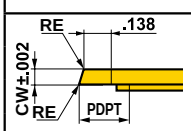
✶1 When the width of cutting off (CW) is .028inch.
✶2 Clamp Torque (lbf-in) : NS401=31

RECOMMENDED CUTTING CONDITIONS

	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF**	165—490	.0008—.0035
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.0035
M	Stainless Steel	**VP15TF**	165—395	.0008—.0019
N	Non-Ferrous Metal	**VP15TF**	230—755	.0012—.0043

● : **Inventory maintained. (5 inserts in one case)**

INSERTS

Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated VP15TF	Dimensions (inch) CW	PDPT	RE	CUTDIA* (inch)
Right Hand (R)		With Breaker			**CTAT07080V5RR-B**	R	●	.028	.177	.002	.315
					CTAT10120V5RR-B	R	●	.039	.264	.002	.472
					CTAT15120V5RR-B	R	●	.059	.264	.002	.472
					CTAT20120V5RR-B	R	●	.079	.264	.002	.472
					**CTAT15120V5RR-BX**	R	●	.059	.264	.002	.472
					CTAT20120V5RR-BX	R	●	.079	.264	.002	.472
					**CTAT10120V5RN-B**	N	●	.039	.264	.002	.472
					CTAT15120V5RN-B	N	●	.059	.264	.002	.472
					CTAT20120V5RN-B	N	●	.079	.264	.002	.472
					**CTAT15120V5RN-BX**	N	●	.059	.264	.002	.472
					CTAT20120V5RN-BX	N	●	.079	.264	.002	.472
					**CTAT10110V5RL-B**	L	●	.039	.264	.002	.433
					CTAT15110V5RL-B	L	●	.059	.264	.002	.433
					CTAT20110V5RL-B	L	●	.079	.264	.002	.433
		Without Breaker			**CTAT1012000RR**	R	●	.039	.264	0	.472
					CTAT1512000RR	R	●	.059	.264	0	.472
					CTAT2012000RR	R	●	.079	.264	0	.472
Left Hand (L)		With Breaker			**CTAT07080V5LL-B**	L	●	.028	.177	.002	.315
					CTAT10120V5LL-B	L	●	.039	.264	.002	.472
					CTAT15120V5LL-B	L	●	.059	.264	.002	.472
					CTAT20120V5LL-B	L	●	.079	.264	.002	.472
					**CTAT10120V5LN-B**	N	●	.039	.264	.002	.472
					CTAT15120V5LN-B	N	●	.059	.264	.002	.472
					CTAT20120V5LN-B	N	●	.079	.264	.002	.472
					**CTAT10110V5LR-B**	R	●	.039	.264	.002	.433
					CTAT15110V5LR-B	R	●	.059	.264	.002	.433
					CTAT20110V5LR-B	R	●	.079	.264	.002	.433
		Without Breaker			**CTAT1012000LL**	L	●	.039	.264	0	.472
					CTAT1512000LL	L	●	.059	.264	0	.472
					CTAT2012000LL	L	●	.079	.264	0	.472

Right hand insert shown.

*CUTDIA : Max. Cut Off Diameter

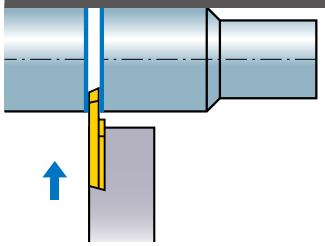
SMALL TOOLS

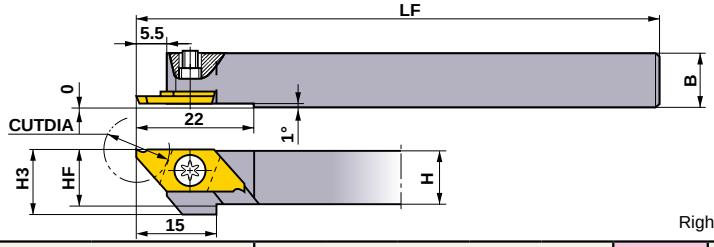
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

CUTTING OFF TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

CTAH



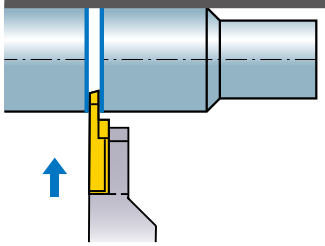


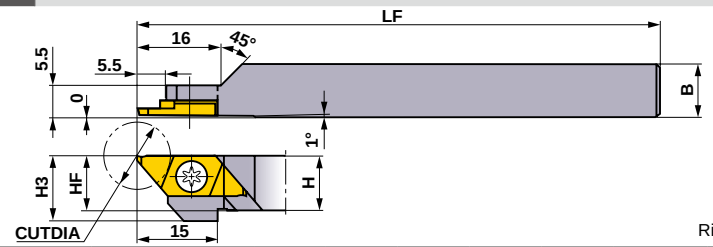
Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	HF	LF	H3	CUTDIA (mm)	✶2 Insert Screw	Wrench
CTAHR/L0810-120	●	●	CTAT	○○○○	8	10	8	120	12	12 (8) ✶1	NS402W	NKY15R
CTAHR/L**1010-120**	●	●		○○○○	10	10	10	120	12		NS402W	NKY15R
CTAHR/L**1212-120**	●	●		○○○○	12	12	12	120	—		NS403W	NKY15R
CTAHR/L**1616-120**	●	●		○○○○	16	16	16	120	—		NS403W	NKY15R

✶1 When the width of cutting off (CW) is 0.7mm.
✶2 Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

CTAH-S





Right hand tool holder only.

Order Number	Stock R	Insert Number		Dimensions (mm) H	B	HF	LF	H3	CUTDIA (mm)	✶2 Insert Screw	Wrench
CTAHR1010-120S	★	CTAT	○○○○	10	10	10	80	12	12 (8) ✶1	NS401	NKY25R

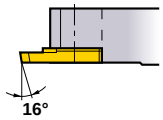
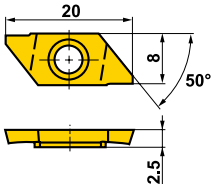
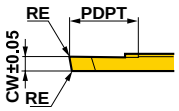
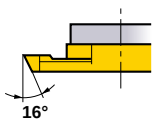
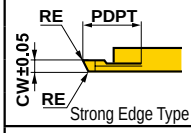
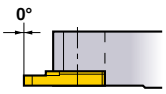
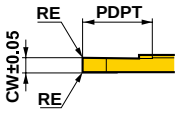
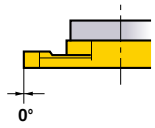
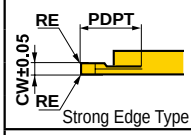
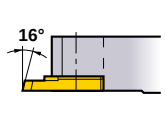
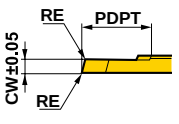
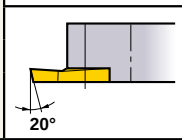
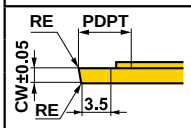
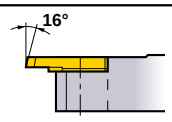
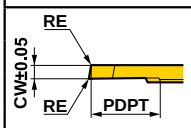
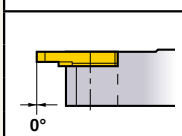
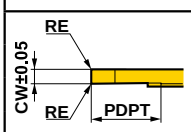
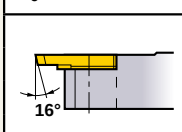
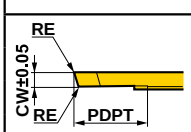
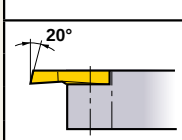
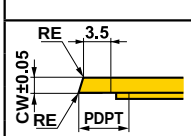
✶1 When the width of cutting off (CW) is 0.7mm.
✶2 Clamp Torque (lbf-in) : NS401=31

RECOMMENDED CUTTING CONDITIONS

	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF**	165—490	.0008—.0035
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.0035
M	Stainless Steel	**VP15TF**	165—395	.0008—.0019
N	Non-Ferrous Metal	**VP15TF**	230—755	.0012—.0043

● : Inventory maintained. ★ : Inventory maintained in Japan.
(5 inserts in one case)

INSERTS

Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated	Dimensions (mm)			CUTDIA* (mm)
							VP15TF	CW	PDPT	RE	
Right Hand (R)		With Breaker			**CTAT07080V5RR-B**	R	●	0.7	4.5	0.05	8
					CTAT10120V5RR-B	R	●	1.0	6.7	0.05	12
					CTAT15120V5RR-B	R	●	1.5	6.7	0.05	12
					CTAT20120V5RR-B	R	●	2.0	6.7	0.05	12
					**CTAT15120V5RR-BX**	R	●	1.5	6.7	0.05	12
					CTAT20120V5RR-BX	R	●	2.0	6.7	0.05	12
					**CTAT10120V5RN-B**	N	●	1.0	6.7	0.05	12
					CTAT15120V5RN-B	N	●	1.5	6.7	0.05	12
					CTAT20120V5RN-B	N	●	2.0	6.7	0.05	12
					**CTAT15120V5RN-BX**	N	●	1.5	6.7	0.05	12
					CTAT20120V5RN-BX	N	●	2.0	6.7	0.05	12
					**CTAT10110V5RL-B**	L	●	1.0	6.7	0.05	11
					CTAT15110V5RL-B	L	●	1.5	6.7	0.05	11
					CTAT20110V5RL-B	L	●	2.0	6.7	0.05	11
		Without Breaker			**CTAT1012000RR**	R	●	1.0	6.7	0	12
					CTAT1512000RR	R	●	1.5	6.7	0	12
					CTAT2012000RR	R	●	2.0	6.7	0	12
Left Hand (L)		With Breaker			**CTAT07080V5LL-B**	L	●	0.7	4.5	0.05	8
					CTAT10120V5LL-B	L	●	1.0	6.7	0.05	12
					CTAT15120V5LL-B	L	●	1.5	6.7	0.05	12
					CTAT20120V5LL-B	L	●	2.0	6.7	0.05	12
					**CTAT10120V5LN-B**	N	●	1.0	6.7	0.05	12
					CTAT15120V5LN-B	N	●	1.5	6.7	0.05	12
					CTAT20120V5LN-B	N	●	2.0	6.7	0.05	12
					**CTAT10110V5LR-B**	R	●	1.0	6.7	0.05	11
					CTAT15110V5LR-B	R	●	1.5	6.7	0.05	11
					CTAT20110V5LR-B	R	●	2.0	6.7	0.05	11
		Without Breaker	Right hand insert shown.		**CTAT1012000LL**	L	●	1.0	6.7	0	12
					CTAT1512000LL	L	●	1.5	6.7	0	12
					CTAT2012000LL	L	●	2.0	6.7	0	12

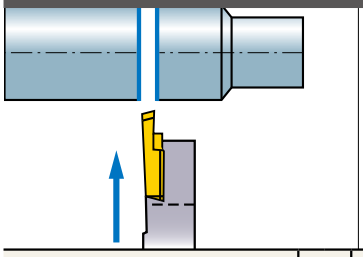
*CUTDIA : Max. Cut Off Diameter

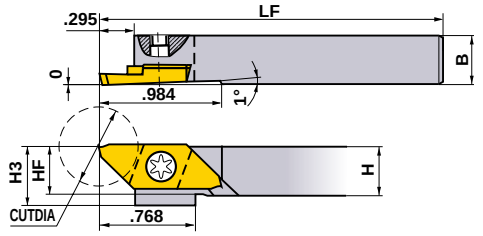
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

CUTTING OFF TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

CTBH



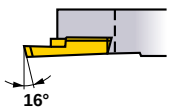
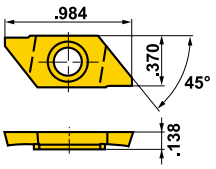
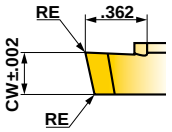
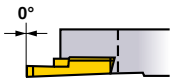
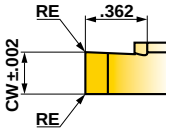
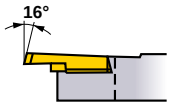
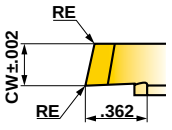
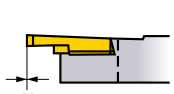
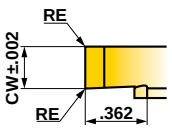
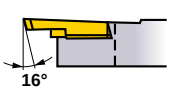
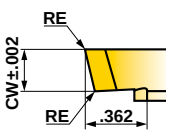


Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	HF	LF	H3	CUTDIA (inch)	* Insert Screw	Wrench
CTBHR/L-062	●	●	CTBT	○○○○	.375	.375	.375	4.724	.500	.630	NS402W	NKY15R
CTBHR/L-**082**	●	●		○○○○	.500	.500	.500	4.724	—	.630	NS403W	NKY15R
CTBHR/L-**102**	●	●		○○○○	.625	.625	.625	4.724	—	.630	NS403W	NKY15R

* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

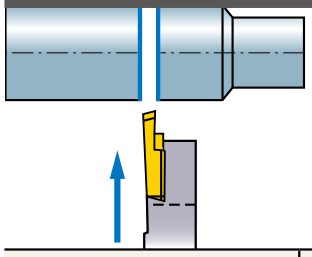
INSERTS

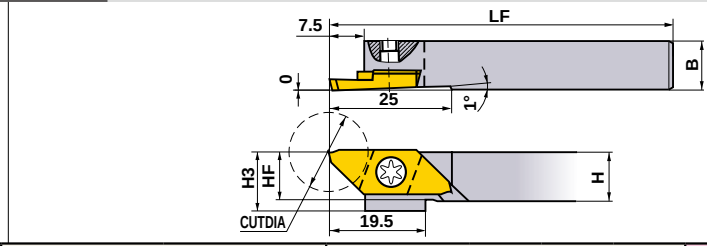
Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated VP15TF	Dimensions (inch) CW	Dimensions (inch) RE	CUTDIA (inch)
Right Hand (R)		With Breaker	 Right hand insert shown.		**CTBT15160V5RR-B**	R	●	.059	.002	.630
					CTBT**20160V5RR-B**	R	●	.079	.002	.630
					**CTBT20160V5RN-B**	N	●	.079	.002	.630
Left Hand (L)					**CTBT20160V5LL-B**	L	●	.079	.002	.630
					**CTBT20160V5LN-B**	N	●	.079	.002	.630
					**CTBT20145V5LR-B**	R	●	.079	.002	.571

● : Inventory maintained. (5 inserts in one case)

METRIC STANDARD

CTBH



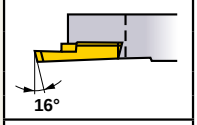
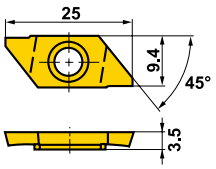
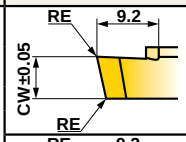
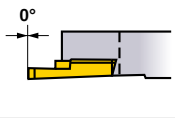
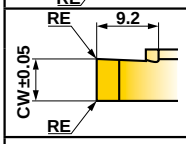
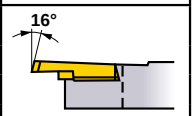
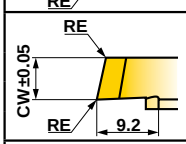
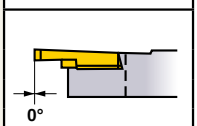
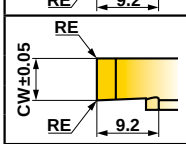
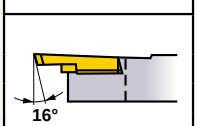
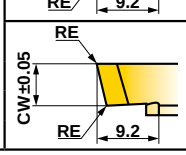


Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	HF	LF	H3	CUTDIA (mm)	✱ Insert Screw	Wrench
CTBHR/L1010-160	●	●	CTBT	○○○○	10	10	10	120	12	16	NS402W	NKY15R
CTBHR/L1212-160	●	●		○○○○	12	12	12	120	—	16	NS403W	NKY15R
CTBHR/L1616-160	●	●		○○○○	16	16	16	120	—	16	NS403W	NKY15R

✱ Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

INSERTS

Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated VP15TF	Dimensions (mm) CW	Dimensions (mm) RE	CUTDIA (mm)
Right Hand (R)		With Breaker			**CTBT15160V5RR-B**	R	●	1.5	0.05	16
					CTBT20160V5RR-B	R	●	2.0	0.05	16
					**CTBT20160V5RN-B**	N	●	2.0	0.05	16
Left Hand (L)					**CTBT20160V5LL-B**	L	●	2.0	0.05	16
					**CTBT20160V5LN-B**	N	●	2.0	0.05	16
					**CTBT20145V5LR-B**	R	●	2.0	0.05	14.5

Right hand insert shown.

RECOMMENDED CUTTING CONDITIONS

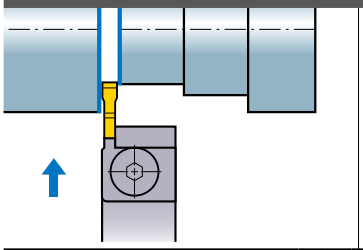
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF**	165—490	.0008—.0035
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.0035
M	Stainless Steel	**VP15TF**	165—395	.0008—.0019
N	Non-Ferrous Metal	**VP15TF**	230—755	.0012—.0043

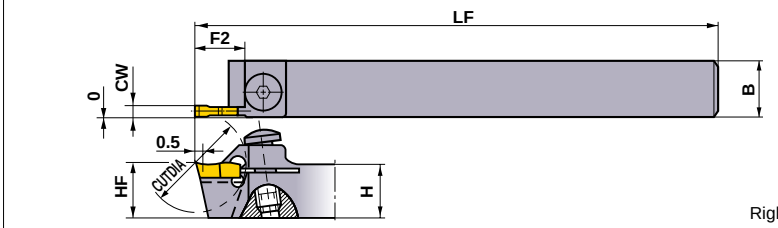
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

CUTTING OFF TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

CTCH





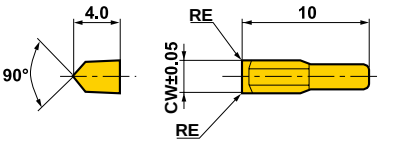
Right hand tool holder shown.

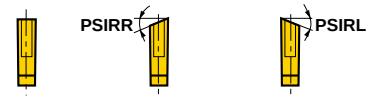
Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	HF	LF	F2	CUTDIA (mm)	* Clamp Screw	Wrench
CTCHR/L1010-200	●	●	CTCT	2○○○	10	10	10	120	11	20	NS501W	HKY25RS
CTCHR/L**1212-200**	●	●	CTCT	2○○○	12	12	12	120	11	20	NS501W	HKY25RS

* Clamp Torque (lbf-in) : NS501W=19

INSERTS

Breaker	Order Number	Hand	Coated VP15TF	Dimensions (mm) CW	PSIRR/L	RE	CUTDIA (mm)	Geometry
With Breaker	**CTCT22200V5N-B**	N	●	2.2	0°	0.05	20	
	CTCT**2220001N-B**	N	●	2.2	0°	0.1	20	
	CTCT**25200V5N-B**	N	●	2.5	0°	0.05	20	
	CTCT**2520001N-B**	N	●	2.5	0°	0.1	20	
	CTCT**22200V5R-B**	R	●	2.2	17°	0.05	20	
	CTCT**2220001R-B**	R	●	2.2	17°	0.1	20	
	CTCT**25200V5R-B**	R	●	2.5	17°	0.05	20	
	CTCT**2520001R-B**	R	●	2.5	17°	0.1	20	
	CTCT**22200V5L-B**	L	●	2.2	17°	0.05	20	
	CTCT**2220001L-B**	L	●	2.2	17°	0.1	20	
	CTCT**25200V5L-B**	L	●	2.5	17°	0.05	20	
	CTCT**2520001L-B**	L	●	2.5	17°	0.1	20	



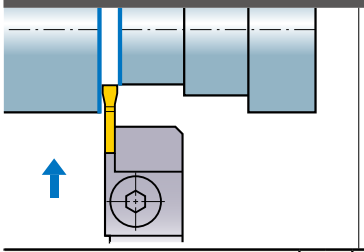


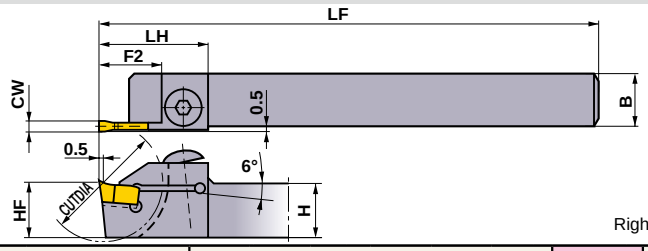
Neutral (N) Right Hand (R) Left Hand (L)

● : Inventory maintained. (10 inserts in one case)

METRIC STANDARD

CTDH





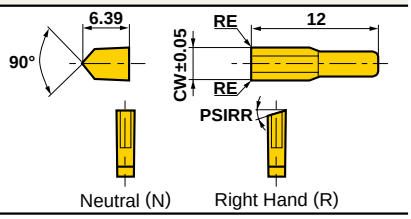
Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	HF	LF	LH	F2	CUTDIA (mm)	* Clamp Screw	Wrench
CTDHR/L1616-230	●		CTDT	2535◌◌	16	16	16	125	24	12.2	23	HBH06020	HKY40R
CTDHR/L**1616-280**	●			2535◌◌	16	16	16	120	25	15	28	NS502W	HKY25R
CTDHR/L**1616-350**	●	●		2535◌◌	16	16	16	125	32	18.5	35	HBH06020	HKY40R

∗ Clamp Torque (lbf-in) : HBH06020=62, NS502W=19

INSERTS

Breaker	Order Number	Hand	Coated VP15TF	Dimensions (mm) CW	PSIRR	RE	CUTDIA (mm)	Geometry
With Breaker	**CTDT2535002N-B**	N	●	2.5	0°	0.2	23—35	
	CTDT**25350V5R-B**	R	●	2.5	8°	≦ 0.05	23—35	
	CTDT**25350V5R-BS**	R	●	2.5	17°	≦ 0.05	23—35	
	CTDT**2535002R-B**	R	●	2.5	8°	0.2	23—35	



RECOMMENDED CUTTING CONDITIONS

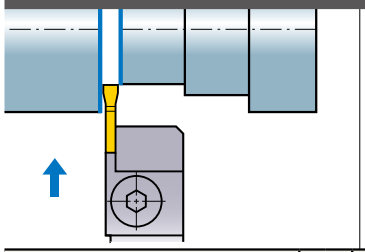
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF**	165—490	.0008—.0035
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.0035
M	Stainless Steel	**VP15TF**	165—395	.0008—.0019
N	Non-Ferrous Metal	**VP15TF**	230—755	.0012—.0043

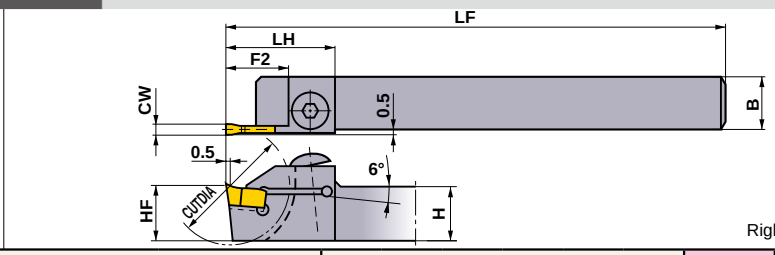
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

CUTTING OFF TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

CTEH





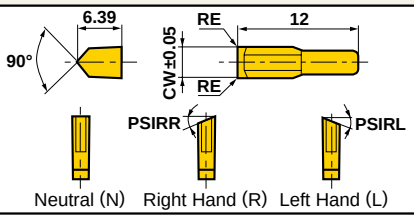
Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	HF	LF	LH	F2	CUTDIA (mm)	* Clamp Screw	Wrench
CTEHR/L1616-230	●		CTET	3035○○	16	16	16	125	24	12.2	23	HBH06020	HKY40R
CTEHR/L**1616-280**	●			3035○○	16	16	16	120	25	15	28	NS502W	HKY25R
CTEHR/L**1616-350**	●	●		3035○○	16	16	16	125	32	18.5	35	HBH06020	HKY40R

∗ Clamp Torque (lbf-in) : HBH06020=62, NS502W=19

INSERTS

Breaker	Order Number	Hand	Coated VP15TF	Dimensions (mm) CW	PSIRR/L	RE	CUTDIA (mm)	Geometry
With Breaker	**CTET30350V5R-B**	R	●	3	8°	≦ 0.05	23—35	
	CTET**30350V5R-BS**	R	●	3	17°	≦ 0.05	23—35	
	CTET**3035002N-B**	N	●	3	0°	0.2	23—35	
	CTET**3035002R-B**	R	●	3	8°	0.2	23—35	
	CTET**3035002L-B**	L	●	3	8°	0.2	23—35	



RECOMMENDED CUTTING CONDITIONS

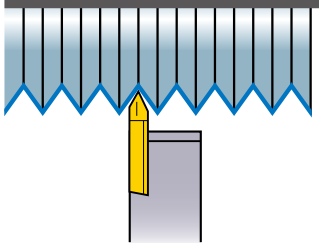
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF**	165—490	.0008—.0035
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.0035
M	Stainless Steel	**VP15TF**	165—395	.0008—.0019
N	Non-Ferrous Metal	**VP15TF**	230—755	.0012—.0043

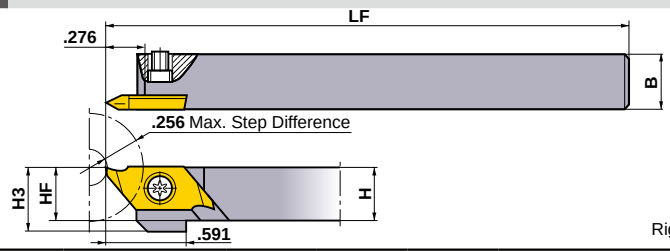
● : **Inventory maintained. (10 inserts in one case)**

THREADING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

TTAH





Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	HF	LF	H3	✶ Insert Screw	Wrench
TTAHR/L-062	●	●	TTAT	○○○○	.375	.375	.375	4.724	.500	NS402W	NKY15R
TTAHR/L**-082**	●	●		○○○○	.500	.500	.500	4.724	—	NS402W	NKY15R
TTAHR/L**-102**	●	●		○○○○	.625	.625	.625	4.724	—	NS402W	NKY15R

✶ Clamp Torque (lbf-in) : NS402W=6.2

INSERTS

Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated VP15TF	Dimensions (inch) PDX	Dimensions (inch) RE	Pitch of Thread (inch) (thread/inch)
Right Hand (R)		With Breaker	General Purpose (60°)	PDX 60° RE	**TTAT60075F5RR-B**	R	●	.016	.002 Flat	.008—.030
					TTAT**60125V5RR-B**	R	●	.031	.002	.020—.049
				PDX 60° RE	TTAT**60075F5RL-B**	L	●	.016	.002 Flat	.008—.030
					TTAT**60125V5RL-B**	L	●	.031	.002	.020—.049
			.098 .787 .315 50°	PDX 60° RE	TTAT**6015001RN-B**	N	●	.049	.004	.039—.059
Left Hand (L)				PDX 60° RE	TTAT**60075F5LR-B**	R	●	.016	.002 Flat	.008—.030
					TTAT**60125V5LR-B**	R	●	.031	.002	.020—.049
				PDX 60° RE	TTAT**60075F5LL-B**	L	●	.016	.002 Flat	.008—.030
					TTAT**60125V5LL-B**	L	●	.031	.002	.020—.049
			Right hand insert shown.	PDX 60° RE	TTAT**6015001LN-B**	N	●	.049	.004	.039—.059
Right Hand (R)			General Purpose (55°)	RE PDX 55° RE	TTAT**55158V5RR-B**	R	●	.031	.002	(40—16)
				PDX 55° RE	TTAT**55158V5RL-B**	L	●	.031	.002	(40—16)
Left Hand (L)			.098 .787 .315 50°	RE PDX 55° RE	TTAT**55158V5LR-B**	R	●	.031	.002	(40—16)
			Right hand insert shown.	PDX 55° RE	TTAT**55158V5LL-B**	L	●	.031	.002	(40—16)

Refer to page D037 for the thread diameter range.

RECOMMENDED CUTTING CONDITIONS

	Work Material	Cutting Speed (SFM)
P	Carbon Steel · Alloy Steel	165—490
	Free Cutting Carbon Steel	100—590

	Work Material	Cutting Speed (SFM)
M	Stainless Steel	165—395
N	Non-Ferrous Metal	230—755

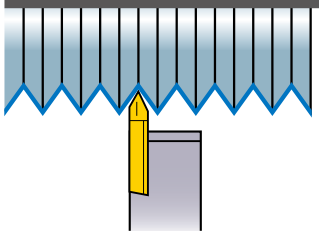
● : Inventory maintained. (5 inserts in one case)

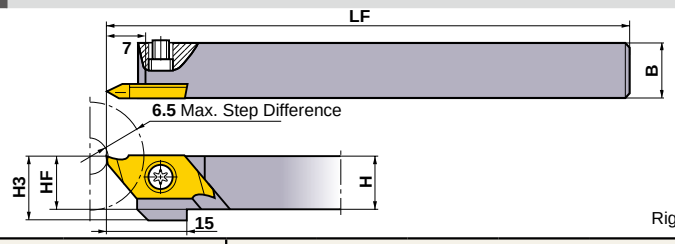
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

THREADING TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

TTAH



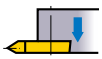
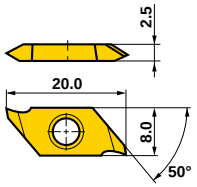
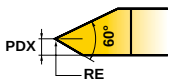
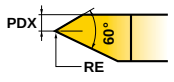
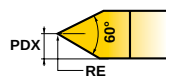
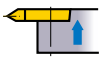
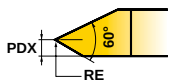
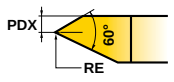
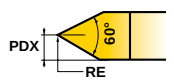
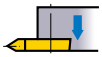
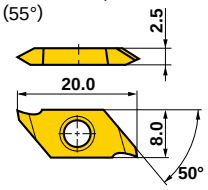
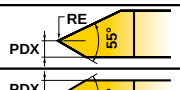
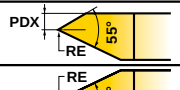
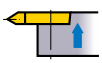
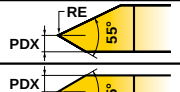
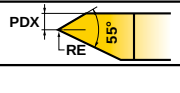


Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	HF	LF	H3	Insert Screw *	Wrench
TTAHR/L0810	●	●	TTAT	○○○○	8	10	8	120	12	NS402W	NKY15R
TTAHR/L**1010**	●	●		○○○○	10	10	10	120	12	NS402W	NKY15R
TTAHR/L**1212**	●	●		○○○○	12	12	12	120	—	NS403W	NKY15R
TTAHR/L**1616**	●	●		○○○○	16	16	16	120	—	NS403W	NKY15R

* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

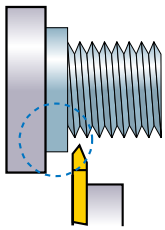
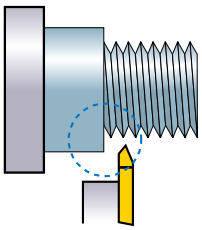
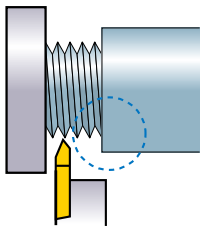
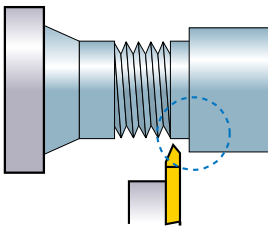
INSERTS

Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated VP15TF	Dimensions (mm) PDX	Dimensions (mm) RE	Pitch of Thread (mm) (thread/inch)
Right Hand (R)		With Breaker	General Purpose (60°)  Right hand insert shown.		**TTAT60075F5RR-B**	R	●	0.4	0.05 Flat	0.2—0.75 (80—36)
					TTAT**60125V5RR-B**	R	●	0.8	0.05	0.5—1.25 (40—16)
					TTAT**60075F5RL-B**	L	●	0.4	0.05 Flat	0.2—0.75 (80—36)
					TTAT**60125V5RL-B**	L	●	0.8	0.05	0.5—1.25 (40—16)
					TTAT**6015001RN-B**	N	●	1.25	0.1	1.0—1.5 (24—18)
Left Hand (L)					TTAT**60075F5LR-B**	R	●	0.4	0.05 Flat	0.2—0.75 (80—36)
					TTAT**60125V5LR-B**	R	●	0.8	0.05	0.5—1.25 (40—16)
					TTAT**60075F5LL-B**	L	●	0.4	0.05 Flat	0.2—0.75 (80—36)
					TTAT**60125V5LL-B**	L	●	0.8	0.05	0.5—1.25 (40—16)
					TTAT**6015001LN-B**	N	●	1.25	0.1	1.0—1.5 (24—18)
Right Hand (R)			General Purpose (55°)  Right hand insert shown.		TTAT**55158V5RR-B**	R	●	0.8	0.05	(40—16)
					TTAT**55158V5RL-B**	L	●	0.8	0.05	(40—16)
Left Hand (L)					TTAT**55158V5LR-B**	R	●	0.8	0.05	(40—16)
					TTAT**55158V5LL-B**	L	●	0.8	0.05	(40—16)

Refer to page D037 for the thread diameter range.

● : Inventory maintained. (5 inserts in one case)

HOLDER APPLICATION

	Right Hand Holder + Right Hand Insert	Left Hand Holder + Left Hand Insert
A Type Insert		
B Type Insert		

★ Above 4 combinations enable machining at the areas shown by ◌.

THREAD DIAMETER RANGE

Application Range

Pitch (mm)	Thread Diameter (mm) ≥ϕ1.0	≥ϕ1.2	≥ϕ1.6	≥ϕ2.0	≥ϕ2.5	≥ϕ3.0	≥ϕ4.0	≥ϕ5.0	≥ϕ6.0	≥ϕ7.0	Number of Passes
0.2											2 – 4
0.25											
0.3											3 – 5
0.35											
0.4											4 – 6
0.45											
0.5											5 – 7
0.6											
0.7			Machining Impossible								
0.75											
0.8											
1											
1.25											6 – 8
1.5											

★Metric Thread (60°)

Pitch(thread/inch)	Thread Diameter									Number of Passes
Inch	≥ϕ0.060	≥ϕ0.073	≥ϕ0.086	≥ϕ0.099	≥ϕ0.112	≥ϕ0.164	≥ϕ0.190	≥ϕ0.250	≥ϕ0.313	
mm	≥ϕ1.524	≥ϕ1.854	≥ϕ2.184	≥ϕ2.515	≥ϕ2.845	≥ϕ4.166	≥ϕ4.826	≥ϕ6.350	≥ϕ7.938	
80										3 – 5
72										
64										4 – 6
56										
48										5 – 7
44										
40										
32										
28			Machining Impossible							
26										
24										
20										6 – 8
18										
16										

★American UN,Whitworth Thread

RECOMMENDED CUTTING CONDITIONS

	Work Material	Cutting Speed (SFM)
P	Carbon Steel · Alloy Steel	165—490
P	Free Cutting Carbon Steel	100—590

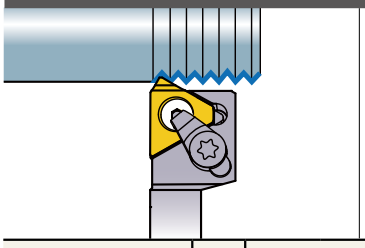
	Work Material	Cutting Speed (SFM)
M	Stainless Steel	165—395
N	Non-Ferrous Metal	230—755

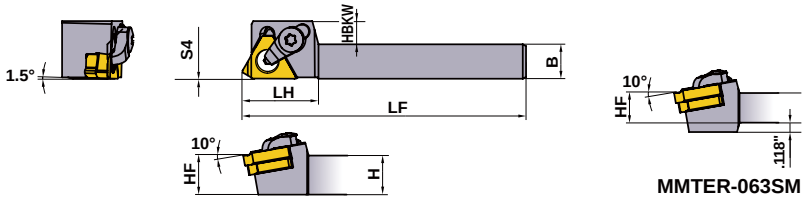
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

THREADING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

MMTE





MMTER-063SM

Order Number	Stock	Insert Number		Dimensions (inch)							Clamp Bridge	Clamp Screw *	Stop Ring	Shim Screw *	Shim	Wrench ①②
	R			H	B	LF	LH	HF	HBKW	S4						
MMTER-063SM	●	TTAT	MMT16ER	.375	.375	4.724	.875	.375	.250	0	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER**-083SM**	●			.500	.500	4.724	.875	.500	.125	0	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R

* Clamp Torque (lbf-in) : SETS51=31, HFC03008=18

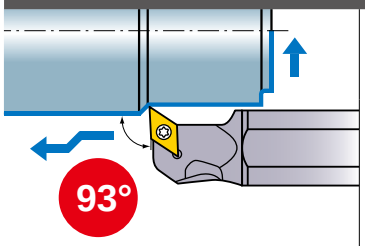
● : Inventory maintained.

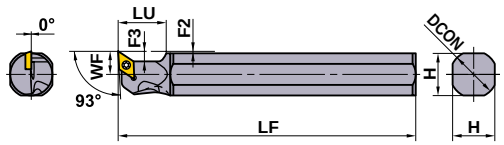
MMTE type inserts ➤ G014–G020
HOW TO SELECT A SHIM ➤ G025, G026

DIMPLE SLEEVE HOLDER (FOR OPPOSITE TOOL POSTS)

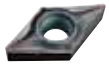
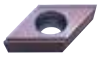
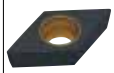
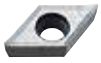
INCH STANDARD

SH





Left hand tool holder only.

Finish	Finish	Light	Medium
SMG	R-F	R-SS	R-SN
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Flat Top**	**Non-Ferrous Metal**	**CBN/PCD**
R-SR		AZ	
			
(2,3)	(2,3)	(2,3)	(2,3)

Order Number	Stock	Insert Number		Dimensions (inch)							*	
	L			DCON	LF	LU	H	WF	F2	F3	Insert Screw	Wrench
SH16H-FSDUCL07	●	DCET DCGT DCGW DCMT DCMW NP-DCGW NP-DCMT NP-DCMW	21.5○○	.625	3.937	.787	.551	.305	.030	.165	TS254	TKY08R
SH19K-FSDUCL07	●			.750	4.921	.787	.669	.364	.030	.165	TS254	TKY08R
SH25M-FSDUCL07	●			1.000	5.906	.787	.906	.482	.030	.165	TS254	TKY08R
SH16H-FSDUCL11	●	DCET DCGT DCGW DCMT DCMW NP-DCGW NP-DCMT NP-DCMW	32.5○○	.625	3.937	.787	.551	.305	.030	.252	TS43	TKY15R
SH19K-FSDUCL11	●			.750	4.921	.787	.669	.364	.030	.252	TS43	TKY15R
SH25M-FSDUCL11	●			1.000	5.906	.787	.906	.482	.030	.252	TS43	TKY15R

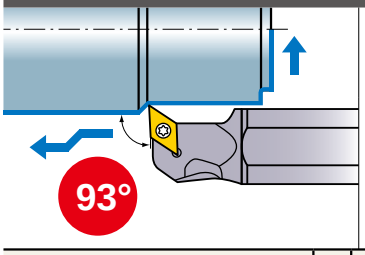
(Note 1) When using insert with right and left hand chip breaker, please use right hand insert.
(Note 2) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.
* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

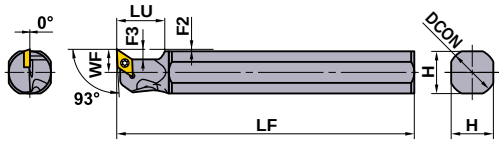
SH○○○ type inserts ➤ A144–A149
CBN & PCD inserts ➤ B039, B040, B056
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

DIMPLE SLEEVE HOLDER (FOR OPPOSITE TOOL POSTS)

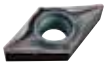
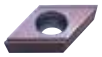
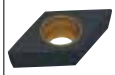
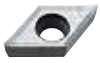
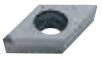
METRIC STANDARD

SH





Left hand tool holder only.

Finish	Finish	Light	Medium
SMG	R-F	R-SS	R-SN
 (2,3)	 (2,3)	 (2,3)	 (2,3)
Medium	**Flat Top**	**Non-Ferrous Metal**	**CBN/PCD**
R-SR		AZ	
 (2,3)	 (2,3)	 (2,3)	 (2,3)

Order Number	Stock	Insert Number		Dimensions (mm)							*	
	L			DCON	LF	LU	H	WF	F3	F2	Insert Screw	Wrench
SH20K-FSDUCL07	●	DCET DCGT DCGW DCMT DCMW NP-DCGW NP-DCMT NP-DCMW	21.5○○	20	125	20	18	9.75	4.2	0.75	TS254	TKY08R
SH22K-FSDUCL07	●			22	125	20	20	10.75	4.2	0.75	TS254	TKY08R
SH20K-FSDUCL11	●	DCET DCGT DCGW DCMT DCMW NP-DCGW NP-DCMT NP-DCMW	32.5○○	20	125	20	18	9.75	6.4	0.75	TS43	TKY15R
SH22K-FSDUCL11	●			22	125	20	20	10.75	6.4	0.75	TS43	TKY15R

(Note 1) When using insert with right and left hand chip breaker, please use right hand insert.
(Note 2) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.
* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

RECOMMENDED CUTTING CONDITIONS

	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF**	165—490	.0004—.006
P	Free Cutting Steel	**VP15TF**	100—590	.0004—.006
P	Free Cutting Steel	**AP25N**	165—820	.0004—.006
M	Stainless Steel	**VP15TF**	165—395	.0008—.004
N	Non-Ferrous Metal	**HTi10**	230—755	.0012—.006

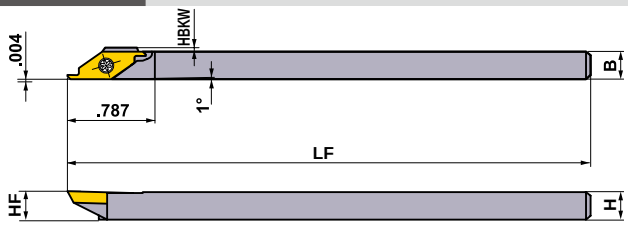
SH○○○ type inserts ➤ A144—A149
CBN & PCD inserts ➤ B039, B040, B056

● : Inventory maintained.

FOR RADIAL TYPE TOOL POSTS

INCH STANDARD

CSVH



Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)					APMX (inch) *1	*2	
	R	L			H	B	HF	LF	HBKW		Insert Screw	Wrench
CSVHR/L-062	●	●	CSVT	○○○○	.375	.375	.375	5.512	0	.118	NS251	NKY15R
CSVHR/L-082	●			○○○○	.500	.500	.500	5.512	0	.118	NS251	NKY15R

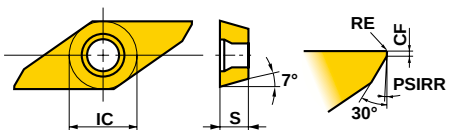
(Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
(Note 2) Each insert has own depth of cut.
*1 APMX : Max. Depth of Cut
*2 Clamp Torque (lbf-in) : NS251=6.2

SMALL TOOLS

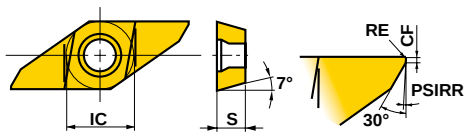
INSERTS

CSVTF (Front turning)

Order Number	Hand	Coated	Dimensions (inch)					APMX * (inch)	Geometry
		VP15KZ	IC	S	RE	CF	PSIRR/L		
CSVTF30AR	R	●	.250	.094	0	.012	5°	.118	Without Breaker
CSVTF**30AL**	L	●	.250	.094	0	.012	5°	.118	
CSVTF**30BR**	R	●	.250	.094	0	.012	2°	.118	
CSVTF**30CR**	R	●	.250	.094	0	.006	2°	.118	
CSVTF**30DR**	R	●	.250	.094	0	.006	5°	.118	
CSVTF30AR-B	R	●	.250	.094	0	.012	5°	.118	With Breaker
CSVTF**30AL-B**	L	●	.250	.094	0	.012	5°	.118	
CSVTF**30BR-B**	R	●	.250	.094	0	.012	2°	.118	
CSVTF**30CR-B**	R	●	.250	.094	0	.006	2°	.118	
CSVTF**30DR-B**	R	●	.250	.094	0	.006	5°	.118	



Right hand insert shown.

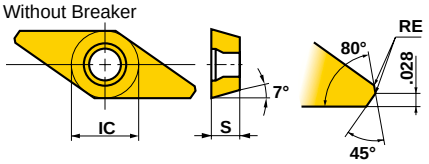


Right hand insert shown.

* APMX : Max. Depth of Cut

CSVTFXL (Front turning, Copying)

Order Number	Hand	Coated	Dimensions (inch)			APMX * (inch)	Geometry
		VP15KZ	IC	S	RE		
CSVTFXL	L	●	.250	.094	0	.118	Without Breaker



* APMX : Max. Depth of Cut

● : Inventory maintained. (5 inserts in one case)

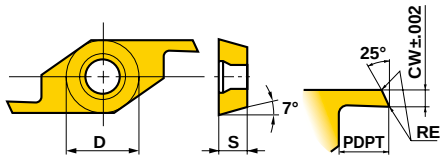
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

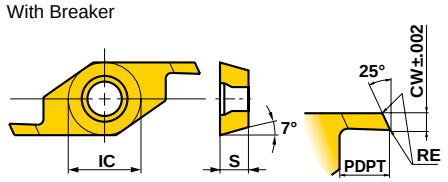
FOR RADIAL TYPE TOOL POSTS

INSERTS

CSVTC (Cutting off)

Order Number	Hand	Coated	Dimensions (inch)					APMX* (inch)	Geometry
		VP15KZ	IC	S	RE	PDPT	CW		
CSVTC0640R	R	●	.250	.094	0	.079	.024	.059	Without Breaker
CSVTC**0750R**	R	●	.250	.094	0	.098	.028	.079	
CSVTC**0750L**	L	●	.250	.094	0	.098	.028	.079	
CSVTC**0850R**	R	●	.250	.094	0	.098	.031	.079	
CSVTC**0850L**	L	●	.250	.094	0	.098	.031	.079	
CSVTC**0950R**	R	●	.250	.094	0	.098	.035	.079	
CSVTC**1060R**	R	●	.250	.094	0	.118	.039	.098	
CSVTC**1060L**	L	●	.250	.094	0	.118	.039	.098	
CSVTC**1360R**	R	●	.250	.094	0	.118	.051	.098	
CSVTC**1360L**	L	●	.250	.094	0	.118	.051	.098	
CSVTC**1560R**	R	●	.250	.094	0	.118	.059	.098	
CSVTC**1560L**	L	●	.250	.094	0	.118	.059	.098	Right hand insert shown.
CSVTC0640R-B	R	●	.250	.094	0	.079	.024	.059	With Breaker
CSVTC**0750R-B**	R	●	.250	.094	0	.098	.028	.079	
CSVTC**0850R-B**	R	●	.250	.094	0	.098	.031	.079	
CSVTC**0950R-B**	R	●	.250	.094	0	.098	.035	.035	
CSVTC**1060R-B**	R	●	.250	.094	0	.118	.039	.098	
CSVTC**1360R-B**	R	●	.250	.094	0	.118	.051	.098	
CSVTC**1560R-B**	R	●	.250	.094	0	.118	.059	.098	Right hand insert shown.

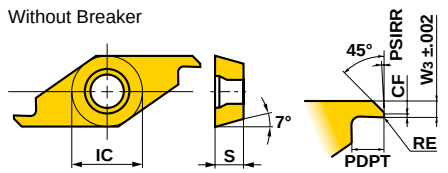


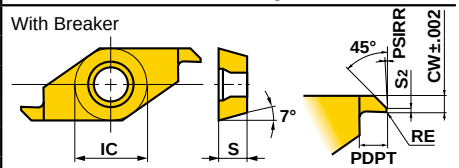


* APMX : Max. Depth of Cut

CSVTB (Back turning)

Order Number	Hand	Coated	Dimensions (inch)							APMX* (inch)	Geometry
		VP15KZ	IC	S	RE	PDPT	CW	CF	PSIRR/L		
CSVTB10AR	R	●	.250	.094	0	.098	.039	.012	5°	.079	Without Breaker
CSVTB**10AL**	L	●	.250	.094	0	.098	.039	.012	5°	.079	
CSVTB**10BR**	R	●	.250	.094	0	.098	.039	.012	2°	.079	
CSVTB**10CR**	R	●	.250	.094	0	.098	.039	.006	2°	.079	
CSVTB**10DR**	R	●	.250	.094	0	.098	.039	.006	5°	.079	
CSVTB**12AR**	R	●	.250	.094	0	.098	.047	.012	5°	.079	
CSVTB**14AR**	R	●	.250	.094	0	.098	.055	.012	5°	.079	Right hand insert shown.
CSVTB10AR-B	R	●	.250	.094	0	.098	.039	.012	5°	.079	With Breaker
CSVTB**10BR-B**	R	●	.250	.094	0	.098	.039	.012	2°	.079	
CSVTB**10CR-B**	R	●	.250	.094	0	.098	.039	.006	2°	.079	
CSVTB**10DR-B**	R	●	.250	.094	0	.098	.039	.006	5°	.079	
CSVTB**12AR-B**	R	●	.250	.094	0	.098	.047	.012	5°	.079	
CSVTB**14AR-B**	R	●	.250	.094	0	.098	.055	.012	5°	.079	Right hand insert shown.

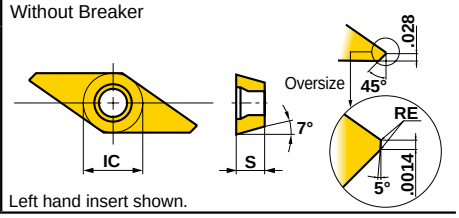




* APMX : Max. Depth of Cut

CSVTBXL (Back turning, Copying)

Order Number	Hand	Coated	Dimensions (inch)			APMX* (inch)	Geometry
		VP15KZ	IC	S	RE		
CSVTBXL	L	●	.250	.094	0	.118	Without Breaker
							Left hand insert shown.

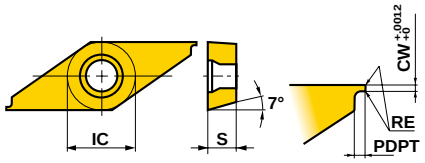


* APMX : Max. Depth of Cut

● : Inventory maintained. (5 inserts in one case)

CSVTG (Grooving)

Order Number	Hand	Coated	Dimensions (inch)					APMX* (inch)	Geometry
		VP15KZ	IC	S	RE	PDPT	CW		
CSVTG02505R	R	●	.250	.094	0	.020	.010	.006	Without Breaker
CSVTG**03005R**	R	●	.250	.094	0	.020	.012	.006	
CSVTG**03505R**	R	●	.250	.094	0	.020	.014	.006	
CSVTG**04005R**	R	●	.250	.094	0	.020	.016	.006	
CSVTG**04510R**	R	●	.250	.094	0	.039	.018	.018	
CSVTG**05010R**	R	●	.250	.094	0	.039	.020	.018	
CSVTG**05510R**	R	●	.250	.094	0	.039	.022	.018	
CSVTG**06010R**	R	●	.250	.094	0	.039	.024	.018	
CSVTG**06510R**	R	●	.250	.094	0	.039	.026	.018	
CSVTG**07010R**	R	●	.250	.094	0	.039	.028	.018	
CSVTG**07520R**	R	●	.250	.094	0	.079	.030	.055	
CSVTG**07520L**	L	●	.250	.094	0	.079	.030	.055	
CSVTG**08020R**	R	●	.250	.094	0	.079	.031	.055	
CSVTG**08520R**	R	●	.250	.094	0	.079	.033	.055	
CSVTG**09020R**	R	●	.250	.094	0	.079	.035	.055	
CSVTG**09520R**	R	●	.250	.094	0	.079	.037	.055	
CSVTG**09520L**	L	●	.250	.094	0	.079	.037	.055	
CSVTG**10020R**	R	●	.250	.094	0	.079	.039	.055	
CSVTG**11030R**	R	●	.250	.094	0	.118	.043	.102	
CSVTG**12030R**	R	●	.250	.094	0	.118	.047	.102	
CSVTG**12030L**	L	●	.250	.094	0	.118	.047	.102	
CSVTG**13030R**	R	●	.250	.094	0	.118	.051	.102	
CSVTG**14030R**	R	●	.250	.094	0	.118	.055	.102	
CSVTG**15030R**	R	●	.250	.094	0	.118	.059	.102	

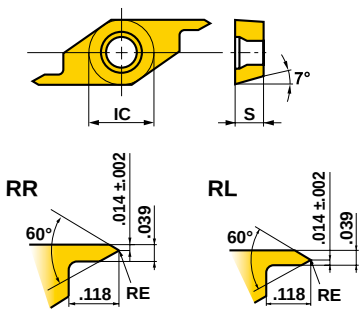


Right hand insert shown.

* APMX : Max. Depth of Cut

CSVTT (Threading)

Order Number	Hand	Coated	Pitch (inch)	Dimensions (inch)			Geometry
		VP15KZ		IC	S	RE	
CSVTT60050RR	R	●	.008–.020	.250	.094	.001	Without Breaker General Purpose (60°)
CSVTT**60050RL**	R	●	.008–.020	.250	.094	.001	



Right hand insert shown.

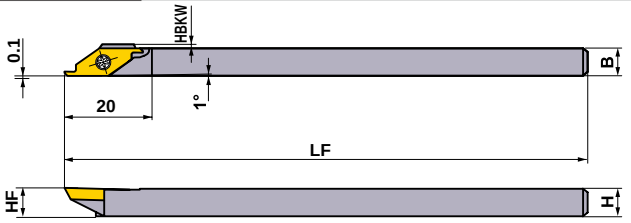
SMALL TOOLS

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

FOR RADIAL TYPE TOOL POSTS

METRIC STANDARD

CSVH



Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)					⋆1 APMX (mm)	⋆2 Insert Screw	Wrench
	R	L			H	B	HF	LF	HBKW			
CSVHR/L0707	●	●	CSVT	◌◌◌◌	7	7	7	140	0.5	3.0	NS251	NKY15R
CSVHR/L**0808**	●	●		◌◌◌◌	8	8	8	140	0	3.0	NS251	NKY15R
CSVHR/L**0909**	●			◌◌◌◌	9.5	9.5	9.5	140	0	3.0	NS251	NKY15R
CSVHR/L**1010**	●	●		◌◌◌◌	10	10	10	140	0	3.0	NS251	NKY15R
CSVHR/L**1212**	●			◌◌◌◌	12	12	12	140	0	3.0	NS251	NKY15R

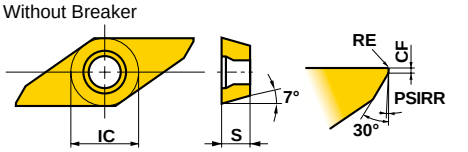
(Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
(Note 2) Each insert has own depth of cut.
⋆1 APMX : Max. Depth of Cut
⋆2 Clamp Torque (lbf-in) : NS251=6.2

INSERTS

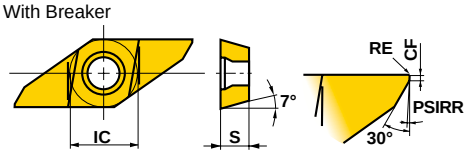
CSVTF

(Front turning)

Order Number	Hand	Coated	Dimensions (mm)					APMX ⋆ (mm)	Geometry
		VP15KZ	IC	S	RE	CF	PSIRR/L		
CSVTF30AR	R	●	6.35	2.38	0	0.3	5°	3.0	Without Breaker
CSVTF**30AL**	L	●	6.35	2.38	0	0.3	5°	3.0	
CSVTF**30BR**	R	●	6.35	2.38	0	0.3	2°	3.0	
CSVTF**30CR**	R	●	6.35	2.38	0	0.15	2°	3.0	
CSVTF**30DR**	R	●	6.35	2.38	0	0.15	5°	3.0	
CSVTF30AR-B	R	●	6.35	2.38	0	0.3	5°	3.0	With Breaker
CSVTF**30AL-B**	L	●	6.35	2.38	0	0.3	5°	3.0	
CSVTF**30BR-B**	R	●	6.35	2.38	0	0.3	2°	3.0	
CSVTF**30CR-B**	R	●	6.35	2.38	0	0.15	2°	3.0	
CSVTF**30DR-B**	R	●	6.35	2.38	0	0.15	5°	3.0	



Right hand insert shown.



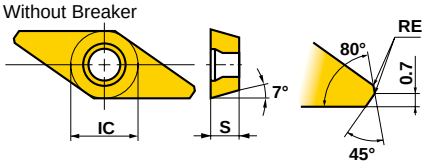
Right hand insert shown.

⋆ APMX : Max. Depth of Cut

CSVTFXL

(Front turning, Copying)

Order Number	Hand	Coated	Dimensions (mm)			APMX ⋆ (mm)	Geometry
		VP15KZ	IC	S	RE		
CSVTFXL	L	●	6.35	2.38	0	3.0	Without Breaker



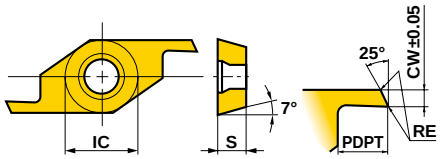
⋆ APMX : Max. Depth of Cut

● : **Inventory maintained. (5 inserts in one case)**

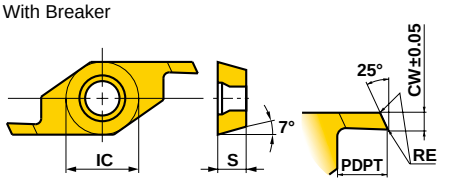
INSERTS

CSVTC (Cutting off)

Order Number	Hand	Coated	Dimensions (mm)					APMX* (mm)	Geometry
		VP15KZ	IC	S	RE	PDPT	CW		
CSVTC0640R	R	●	6.35	2.38	0	2.0	0.6	1.5	Without Breaker
CSVTC**0750R**	R	●	6.35	2.38	0	2.5	0.7	2.0	
CSVTC**0750L**	L	●	6.35	2.38	0	2.5	0.7	2.0	
CSVTC**0850R**	R	●	6.35	2.38	0	2.5	0.8	2.0	
CSVTC**0850L**	L	●	6.35	2.38	0	2.5	0.8	2.0	
CSVTC**0950R**	R	●	6.35	2.38	0	2.5	0.9	2.0	
CSVTC**1060R**	R	●	6.35	2.38	0	3.0	1.0	2.5	
CSVTC**1060L**	L	●	6.35	2.38	0	3.0	1.0	2.5	
CSVTC**1360R**	R	●	6.35	2.38	0	3.0	1.3	2.5	
CSVTC**1360L**	L	●	6.35	2.38	0	3.0	1.3	2.5	
CSVTC**1560R**	R	●	6.35	2.38	0	3.0	1.5	2.5	
CSVTC**1560L**	L	●	6.35	2.38	0	3.0	1.5	2.5	
CSVTC0640R-B	R	●	6.35	2.38	0	2.0	0.6	1.5	With Breaker
CSVTC**0750R-B**	R	●	6.35	2.38	0	2.5	0.7	2.0	
CSVTC**0850R-B**	R	●	6.35	2.38	0	2.5	0.8	2.0	
CSVTC**0950R-B**	R	●	6.35	2.38	0	2.5	0.9	0.9	
CSVTC**1060R-B**	R	●	6.35	2.38	0	3.0	1.0	2.5	
CSVTC**1360R-B**	R	●	6.35	2.38	0	3.0	1.3	2.5	
CSVTC**1560R-B**	R	●	6.35	2.38	0	3.0	1.5	2.5	



Right hand insert shown.

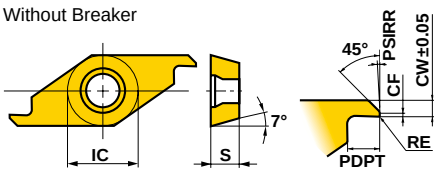


Right hand insert shown.

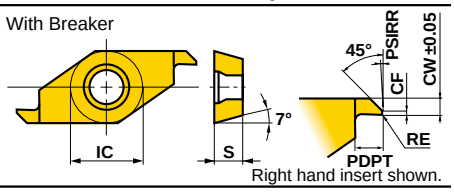
* APMX : Max. Depth of Cut

CSVTB (Back turning)

Order Number	Hand	Coated	Dimensions (mm)							APMX* (mm)	Geometry
		VP15KZ	IC	S	RE	PDPT	CW	CF	PSIRR/L		
CSVTB10AR	R	●	6.35	2.38	0	2.5	1	0.3	5°	2.0	Without Breaker
CSVTB**10AL**	L	●	6.35	2.38	0	2.5	1	0.3	5°	2.0	
CSVTB**10BR**	R	●	6.35	2.38	0	2.5	1	0.3	2°	2.0	
CSVTB**10CR**	R	●	6.35	2.38	0	2.5	1	0.15	2°	2.0	
CSVTB**10DR**	R	●	6.35	2.38	0	2.5	1	0.15	5°	2.0	
CSVTB**12AR**	R	●	6.35	2.38	0	2.5	1.2	0.3	5°	2.0	
CSVTB**14AR**	R	●	6.35	2.38	0	2.5	1.4	0.3	5°	2.0	
CSVTB10AR-B	R	●	6.35	2.38	0	2.5	1	0.3	5°	2.0	With Breaker
CSVTB**10BR-B**	R	●	6.35	2.38	0	2.5	1	0.3	2°	2.0	
CSVTB**10CR-B**	R	●	6.35	2.38	0	2.5	1	0.15	2°	2.0	
CSVTB**10DR-B**	R	●	6.35	2.38	0	2.5	1	0.15	5°	2.0	
CSVTB**12AR-B**	R	●	6.35	2.38	0	2.5	1.2	0.3	5°	2.0	
CSVTB**14AR-B**	R	●	6.35	2.38	0	2.5	1.4	0.3	5°	2.0	



Right hand insert shown.

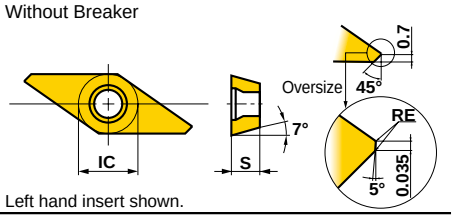


Right hand insert shown.

* APMX : Max. Depth of Cut

CSVTBXL (Back turning, Copying)

Order Number	Hand	Coated	Dimensions (mm)			APMX* (mm)	Geometry
		VP15KZ	IC	S	RE		
CSVTBXL	L	●	6.35	2.38	0	3.0	Without Breaker



Left hand insert shown.

* APMX : Max. Depth of Cut

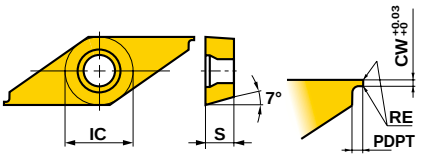
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

FOR RADIAL TYPE TOOL POSTS

INSERTS

CSVTG (Grooving)

Order Number	Hand	Coated	Dimensions (mm)					APMX * (mm)	Geometry
		VP15KZ	IC	S	RE	PDPT	CW		
CSVTG02505R	R	●	6.35	2.38	0	0.5	0.25	0.15	Without Breaker
CSVTG**03005R**	R	●	6.35	2.38	0	0.5	0.3	0.15	
CSVTG**03505R**	R	●	6.35	2.38	0	0.5	0.35	0.15	
CSVTG**04005R**	R	●	6.35	2.38	0	0.5	0.4	0.15	
CSVTG**04510R**	R	●	6.35	2.38	0	1.0	0.45	0.45	
CSVTG**05010R**	R	●	6.35	2.38	0	1.0	0.5	0.45	
CSVTG**05510R**	R	●	6.35	2.38	0	1.0	0.55	0.45	
CSVTG**06010R**	R	●	6.35	2.38	0	1.0	0.6	0.45	
CSVTG**06510R**	R	●	6.35	2.38	0	1.0	0.65	0.45	
CSVTG**07010R**	R	●	6.35	2.38	0	1.0	0.7	0.45	
CSVTG**07520R**	R	●	6.35	2.38	0	2.0	0.75	1.4	
CSVTG**07520L**	L	●	6.35	2.38	0	2.0	0.75	1.4	
CSVTG**08020R**	R	●	6.35	2.38	0	2.0	0.8	1.4	
CSVTG**08520R**	R	●	6.35	2.38	0	2.0	0.85	1.4	
CSVTG**09020R**	R	●	6.35	2.38	0	2.0	0.9	1.4	
CSVTG**09520R**	R	●	6.35	2.38	0	2.0	0.95	1.4	
CSVTG**09520L**	L	●	6.35	2.38	0	2.0	0.95	1.4	
CSVTG**10020R**	R	●	6.35	2.38	0	2.0	1.0	1.4	
CSVTG**11030R**	R	●	6.35	2.38	0	3.0	1.1	2.6	
CSVTG**12030R**	R	●	6.35	2.38	0	3.0	1.2	2.6	
CSVTG**12030L**	L	●	6.35	2.38	0	3.0	1.2	2.6	
CSVTG**13030R**	R	●	6.35	2.38	0	3.0	1.3	2.6	
CSVTG**14030R**	R	●	6.35	2.38	0	3.0	1.4	2.6	
CSVTG**15030R**	R	●	6.35	2.38	0	3.0	1.5	2.6	

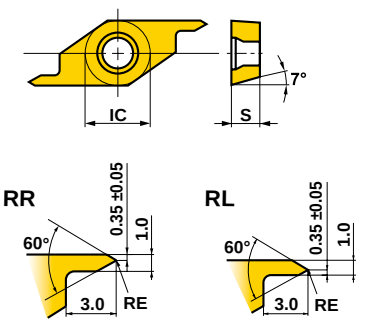


Right hand insert shown.

* APMX : Max. Depth of Cut

CSVTT (Threading)

Order Number	Hand	Coated	Pitch (mm)	Dimensions (mm)			Geometry
		VP15KZ		IC	S	RE	
CSVTT60050RR	R	●	0.2—0.5	6.35	2.38	0.03	Without Breaker General Purpose (60°)
CSVTT**60050RL**	R	●	0.2—0.5	6.35	2.38	0.03	



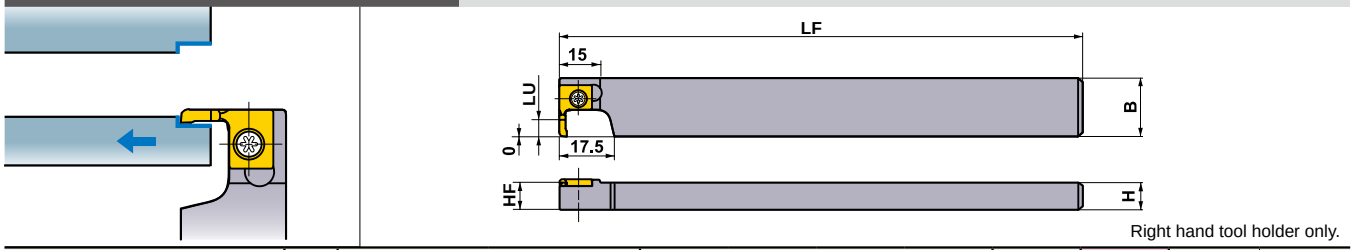
Right hand insert shown.

● : Inventory maintained. (5 inserts in one case)

BORING TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

SBAH — Without off set

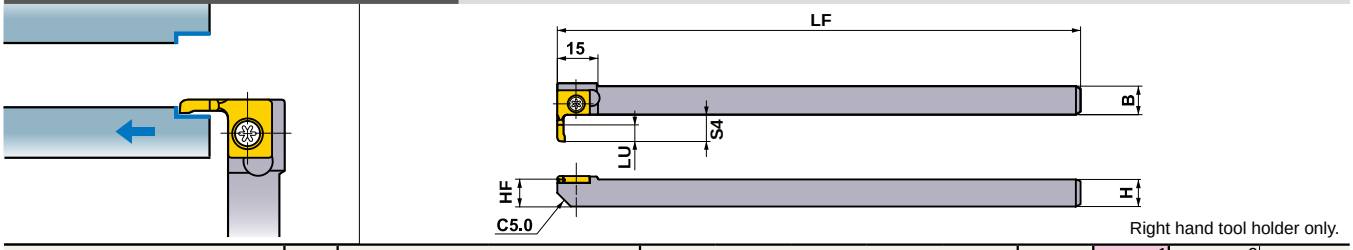


Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)				LU (mm)	DMIN (mm) *1	*2	
	R			H	B	LF	HF			Insert Screw	Wrench
SBAHR1022	●	SBAT	3080□□L/L-B	10	21.5	120	10	8	3	NS402W	NKY15R
SBAHR**1222**	●	SBAT	3080□□L/L-B	12	21.5	120	12	8	3	NS403W	NKY15R

*1 DMIN : Min. Cutting Diameter
*2 Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

SBAH — With off set



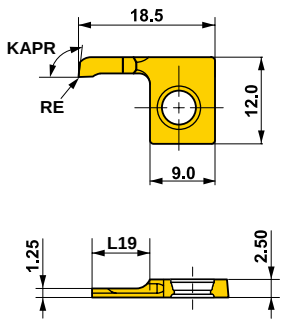
Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)					LU (mm)	DMIN (mm) *1	*2	
	R			H	B	LF	HF	S4			Insert Screw	Wrench
SBAHR1010	●	SBAT	3080□□L/L-B	10	10	120	10	10	8	3	NS402W	NKY15R

*1 DMIN : Min. Cutting Diameter
*2 Clamp Torque (lbf-in) : NS402W=0.7

INSERTS

Breaker	Order Number	Coated	Dimensions (mm)			DMIN (mm) *	Geometry
		VP15KZ	KAPR	RE	L19		
Without Breaker	**SBAT308000L**	●	95°	0	8.0	3	
	SBAT**3080V5L**	●	95°	0.05	8.0	3	
With Breaker	**SBAT308000L-B**	●	95°	0	8.0	3	
	SBAT**3080V5L-B**	●	95°	0.05	8.0	3	



* DMIN : Min. Cutting Diameter

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

GUIDE TO BORING BARS

●Section organization

①Organized by product series.
(Refer to the index on the next page.)

TYPE OF BORING BAR
indicates the initial letters for the order number, as well as applicable insert types.

TITLE OF PRODUCT SERIES

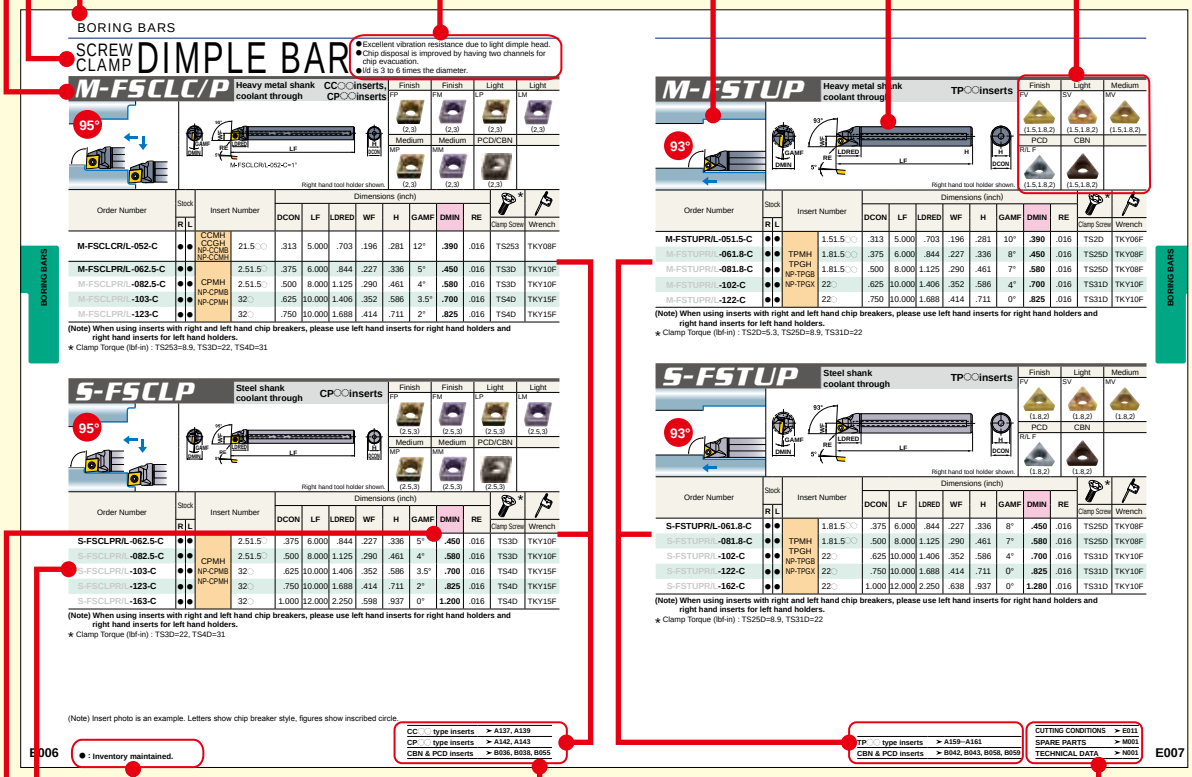
PRODUCT SECTION

PRODUCT FEATURES

FIGURE SHOWING TOOLING APPLICATION
uses illustrations and arrows to depict possible machining applications along with cutting edge lead angles.

GEOMETRY

CHIP BREAKER BY CUTTING APPLICATION



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

REFERENCE PAGE FOR APPLICABLE INSERTS
indicates reference pages for details of inserts that are applicable to the title product.

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, minimum cutting diameters, standard corner radius, and spare parts.

MIN. CUTTING DIAMETER
is color-coded to locate at a glance.

PAGE REFERENCE
·SPARE PARTS
·TECHNICAL DATA
·CUTTING CONDITIONS
indicates reference pages, on the right hand page of each double-page spread.

●To Order: Please specify order number and hand of tool (right/left).

TURNING

BORING BARS

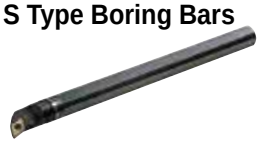
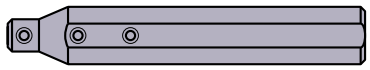
CLASSIFICATION ····· E002
IDENTIFICATION ····· E004

STANDARD BORING BARS
SCREW CLAMP DIMPLE BAR ····· E006
SCREW CLAMP TYPE BORING BARS ····· E012
DOUBLE CLAMP DIMPLE BAR ····· E021
MULTIPLE CLAMP TYPE BORING BARS ····· E024
AL TYPE BORING BARS ····· E028
MICRO-DEX BORING BARS ····· E029
MICRO-MINI BORING BARS ····· E031
MICRO-MINI TWIN BORING BARS ····· E032
RBH TYPE HOLDER (FOR MICRO-MINI AND MICRO-MINI TWIN) ····· E034
SBH TYPE HOLDER (FOR MICRO-MINI AND MICRO-MINI TWIN) ····· E037

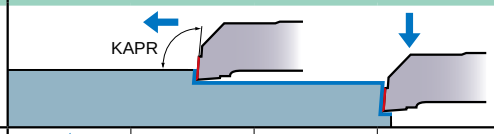
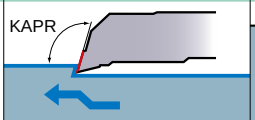
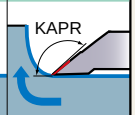
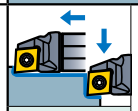
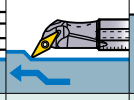
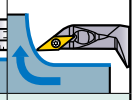
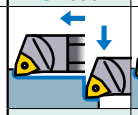
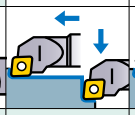
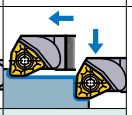
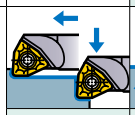
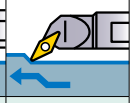
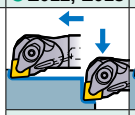
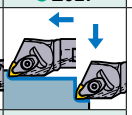
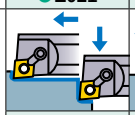
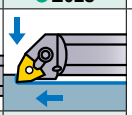
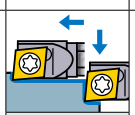
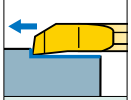
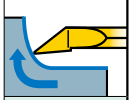
∗Arranged by Alphabetical order

E032	**CB**	E034	**RBH (INCH)**	E028	**S-STFE**
E033	**CR**	E036	**RBH (MM)**	E015	**S-STUC**
E031	**C◌◌◌R-BLS**	E037	**SBH**	E016	**S-SVQC**
E013	**C-SCLC**	E029	**SCLC**	E017	**S-SVUC**
E014	**C-SDQC**	E021	**S-DCLN**	E019	**S-SWUC**
E016	**C-STUC**	E021	**S-DDUN**	E030	**STUC**
E017	**C-SWL**	E022	**S-DSKN**	E029	**SWUB**
E019	**C-SWLO**	E022	**S-DTFN**		
E018	**FSWL1**	E023	**S-DVUN**		
E018	**FSWL2**	E023	**S-DWLN**		
E006	**M-FSCLC/P**	E006	**S-FSCLP**		
E008	**M-FSDQC**	E007	**S-FSTUP**		
E008	**M-FSDUC**	E024	**S-MCLN**		
E007	**M-FSTUP**	E024	**S-MDUN**		
E010	**M-FSVJB/C**	E025	**S-MSKN**		
E010	**M-FSVPB/C**	E025	**S-MTFN**		
E009	**M-FSVUB/C**	E026	**S-MVUN**		
E009	**M-FSWUB/P**	E026	**S-MWLN**		
E027	**M-MWLN**	E012	**S-SCLC**		
E012	**M-SCLC**	E013	**S-SDQC**		
E020	**M-SWLO**	E014	**S-SDUC**		
E020	**M-SWLO**	E015	**S-SSKC**		

CLASSIFICATION

Type of Tool	Features	KAPR= 75°	KAPR= 90°, 91°	KAPR= 93°			
		KAPR	KAPR	KAPR			
SCREW CLAMP DIMPLE BAR 	● The minimum cutting diameter is ϕ.390inch. ● 5°, 11° positive insert. ● Excellent vibration resistance due to light dimple head. ● Chip disposal is improved by having two channels for chip evacuation. ● l/d is 3 to 6 times the diameter.			M-FSTUP, S-FSTUP ➲E007	M-FSDUC ➲E008	M-FSVUB/C ➲E009	M-FSWUB/P ➲E009
S Type Boring Bars 	● Two wall pocket. ● 7º positive insert, low cutting force. ● Screw-on type.	S-SSKC ➲E015		S-SDUC ➲E014	S-STUC, C-STUC ➲E015, E016	S-SVUC ➲E017	S-SWUC ➲E019
DOUBLE CLAMP DIMPLE BAR 	● Negative rake. ● New double clamp type. ● Holds inserts securely. ● Excellent cutting edge repeatability.	S-DSKN ➲E022	S-DTFN ➲E022	S-DDUN ➲E021	S-DVUN ➲E023		
M Type Boring Bars 	● Negative rake. ● Two wall pocket. ● Pin lock and top clamp retention. ● (Opt.) Single clamp available as clamp on or pin lock holder.	S-MSKN ➲E025	S-MTFN ➲E025	S-MDUN ➲E024	S-MVUN ➲E026		
AL Type Boring Bars 	● Shank sizes ϕ.625inch thru ϕ1.000inch. ● Screw-on type. ● Recommended for aluminum, nonferrous metals and plastics.		S-STFE ➲E028				
MICRO-DEX Boring Bars (Carbide Shank) 	● The minimum cutting diameter is ϕ5mm (.197inch). ● 7°positive insert. ● Carbide shank type. ● Easy-to-use tool geometries. ● Suitable for small workpiece. ● l/d is 5 times the diameter.			SWUB ➲E029	STUC ➲E030		
MICRO-MINI TWIN Boring Bars 	● The minimum cutting diameter is ϕ2.2mm (.087inch). ● Solid carbide type with two cutting edges. ● Continuous cutting from boring to facing. ● With or without a chip breaker.						
MICRO-MINI Boring Bars 	● The minimum cutting diameter is ϕ3.2mm (.126inch). ● Solid carbide type (Single cutting edges). ● l/d is 5 times the diameter. ● Cutting edge can be shaped according to the application. Thus, it covers a wide cutting range (threading,grooving,copying, etc.).	 C○○F/HR-BLS ➲E031					
RBH Type Holder 	● Holder for MICRO-MINI TWIN and MICRO-MINI. ● Round shanks suitable for use with frontal gang type tool posts with sleeve.	 RBH Inch➲E034, Metric➲E036					
SBH Type Holder 	● Holder for MICRO-MINI TWIN and MICRO-MINI. ● Square shanks suitable for use with frontal gang type tool posts.	 SBH ➲E037					

(Note 1) **S** : Steel shank, **M** : Heavy metal shank, **C** : Carbide shank. (For Micro-dex boring bars, carbide shank only.)

	KAPR= 95°					KAPR = 107°30′ – 117°30′		KAPR= 142°	Selection Standard							
									Economical	Low Cutting Resistance (Sharpness)	Clamp Rigidity	Vibration Resisiance	Operation Efficiency	Coolant Thru	Specialized	Small Diameter Cutting
	 M-FSCLC/P, S-FSCLP ➲E006					 M-FSDQC ➲E008	 M-FSVPB/C ➲E010	 M-FSVJB/C ➲E010		◎		○	◎	◎		
	 C-SWLO, M-SWLO ➲E019, E020	 S-SCLC, M-SCLC, C-SCLC ➲E012, E013	 C-SWL ➲E017		 FSWL1, 2 ➲E018	 S-SDQC, C-SDQC ➲E013, E014	 S-SVQC ➲E016			○		○*				
		 S-DCLN ➲E021	 S-DWLN ➲E023								◎		◎	◎		
		 S-MCLN ➲E024	 S-MWLN, M-MWLN ➲E026, E027						◎		◎		○			
										◎		○			◎	
		 SCLC ➲E029										◎				◎
		 CB○○RS(-B) ➲E032						 CR○○RS-01(B) ➲E033		◎		◎				◎
										◎						◎

(Note 2) ◎: 1st recommendation. ○: 2nd recommendation.
(Note 3) ⋆ Indicates in case that shank material is carbide.

IDENTIFICATION

S Type, D Type, Double Clamp Boring Bars, M Type Boring Bars

① Shank Material	
C	Carbide Shank
M	Heavy Metal Shank
S	Steel Shank

② Method of Holding	
D	1 action
M	2 action
S	

③ Insert Shape			
C	80°	T	60°
D	55°	V	35°
S	90°	W	60°

④ Tool Style			
F	91°	Q	107°30′ 117°30′
K	75°	U	93°
L	95° 95°	Z	

S - S C L C R - 10 3 - C
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

⑤ Insert Relief Angle	
C	7°
E	20°
N	0°
P	11°

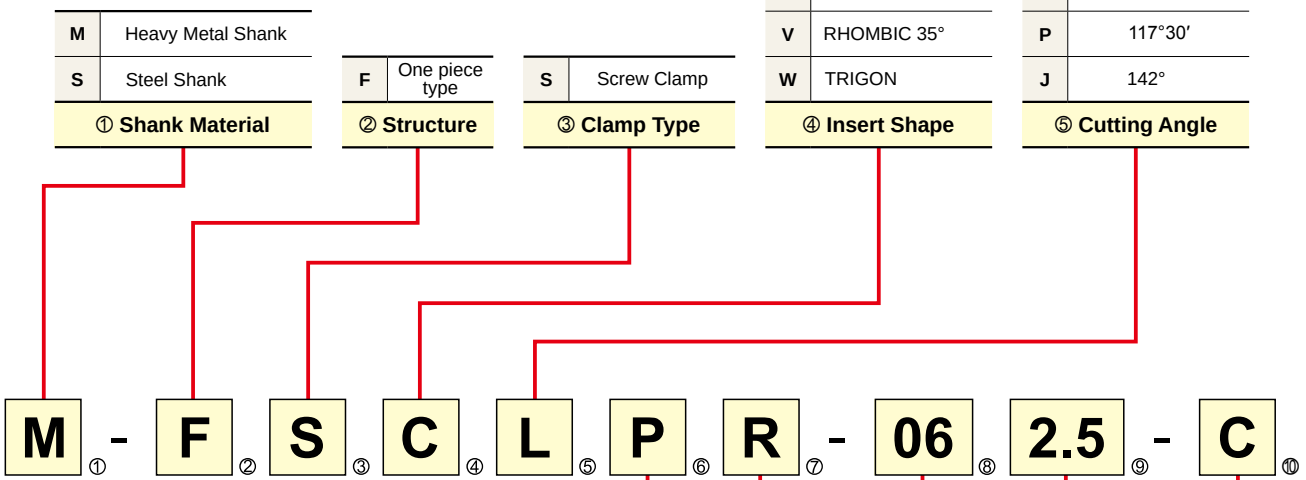
⑥ Hand of Tool	
R	
L	

⑦ Shank Size								
06	08	10	12	16	20	24	28	32
.375	.500	.625	.750	1.000	1.250	1.500	1.750	2.000

⑧ Insert Size									
Inscribed Circle of Insert (inch)	.187	.219	.250	.313	.375	.500	.625	.750	1.000
T	1.5	1.8	2	2.5	3	4	5	6	8
S R			2	2.5	3	4	5	6	8
W			2	2.5	3	4	5	6	
80° C					3	4	5	6	8
55° D					3	4	5	6	8
35° V			2		3				

⑨ Oil hole	
C	Coolant Through

SCREW CLAMP DIMPLE BAR



① Shank Material	
M	Heavy Metal Shank
S	Steel Shank

② Structure	
F	One piece type

③ Clamp Type	
S	Screw Clamp

④ Insert Shape	
C	RHOMBIC 80°
D	RHOMBIC 55°
T	TRIANGULAR 60°
V	RHOMBIC 35°
W	TRIGON

⑤ Cutting Angle	
U	93°
L	95°
Q	107°30′
P	117°30′
J	142°

⑥ Insert Relief Angle	
C	7°
P	11°

⑦ Hand of Tool	
R	Right Hand
L	Left Hand

⑧ Shank Diameter	
05	.313
06	.375
08	.500
10	.625
12	.750
16	1.000

⑨ Insert Size					
Inscribed circle of insert	.187	.219	.250	.313	.375
RHOMBIC 80°	—	—	2	2.5	3
RHOMBIC 55°	—	—	2	—	3
TRIANGULAR 60°	1.5	1.8	2	—	3
RHOMBIC 35°	1.5	—	2	—	—
TRIGON	1.5	—	2	—	3

⑩ Oil hole	
C	Coolant Through

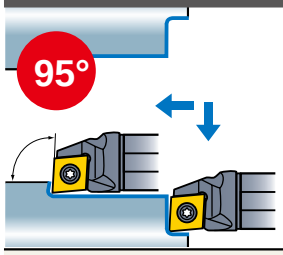
Note: Dimension symbols conforming to ISO13399. See pages PR3-PR6 for details.

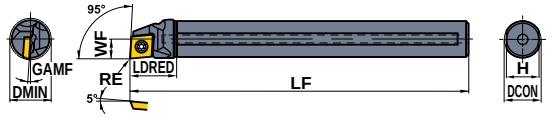
SCREW CLAMP DIMPLE BAR

- Excellent vibration resistance due to light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- l/d is 3 to 6 times the diameter.

M-FSCLC/P

Heavy metal shank coolant through — **CC○○inserts, CP○○inserts**





M-FSCLCR/L-052-C=1°

Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	Medium	PCD/CBN	
MP	MM		
			
(2,3)	(2,3)	(2,3)	

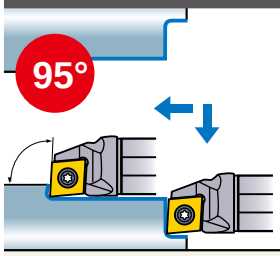
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	Clamp Screw *	Wrench
M-FSCLCR/L-052-C	●	●	CCMH CCGH NP-CCMB NP-CCMH	21.5○○	.313	5.000	.703	.196	.281	12°	**.390**	.016	TS253	TKY08F
M-FSCLPR/L-062.5-C	●	●	CPMH NP-CPMB NP-CPMH	2.51.5○	.375	6.000	.844	.227	.336	5°	**.450**	.016	TS3D	TKY10F
M-FSCLPR/L-082.5-C	●	●		2.51.5○	.500	8.000	1.125	.290	.461	4°	**.580**	.016	TS3D	TKY10F
M-FSCLPR/L-103-C	●	●		32○	.625	10.000	1.406	.352	.586	3.5°	**.700**	.016	TS4D	TKY15F
M-FSCLPR/L-123-C	●	●		32○	.750	10.000	1.688	.414	.711	2°	**.825**	.016	TS4D	TKY15F

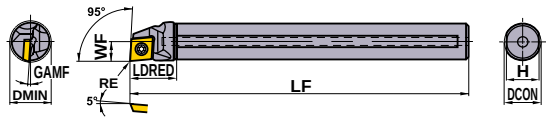
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS253=8.9, TS3D=22, TS4D=31

S-FSCLP

Steel shank coolant through — **CP○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2.5,3)	(2.5,3)	(2.5,3)	(2.5,3)
Medium	Medium	PCD/CBN	
MP	MM		
			
(2.5,3)	(2.5,3)	(2.5,3)	

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	Clamp Screw *	Wrench
S-FSCLPR/L-062.5-C	●	●	CPMH NP-CPMB NP-CPMH	2.51.5○	.375	6.000	.844	.227	.336	5°	**.450**	.016	TS3D	TKY10F
S-FSCLPR/L-082.5-C	●	●		2.51.5○	.500	8.000	1.125	.290	.461	4°	**.580**	.016	TS3D	TKY10F
S-FSCLPR/L-103-C	●	●		32○	.625	10.000	1.406	.352	.586	3.5°	**.700**	.016	TS4D	TKY15F
S-FSCLPR/L-123-C	●	●		32○	.750	10.000	1.688	.414	.711	2°	**.825**	.016	TS4D	TKY15F
S-FSCLPR/L-163-C	●	●		32○	1.000	12.000	2.250	.598	.937	0°	**1.200**	.016	TS4D	TKY15F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS3D=22, TS4D=31

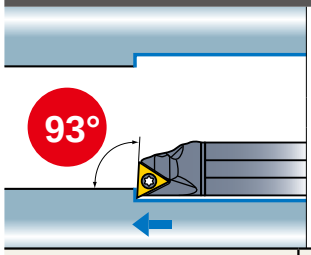
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

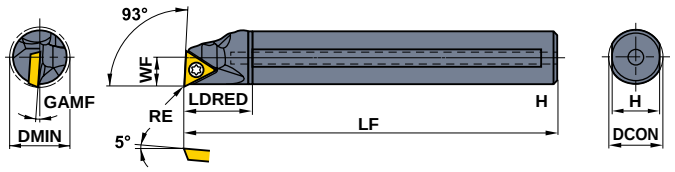
CC○○ type inserts	➤ A137, A139
CP○○ type inserts	➤ A142, A143
CBN & PCD inserts	➤ B036, B038, B055

● : Inventory maintained.

M-FSTUP

Heavy metal shank coolant through — **TP○○inserts**





Right hand tool holder shown.

Finish	Light	Medium
FV	SV	MV
		
(1.5,1.8,2)	(1.5,1.8,2)	(1.5,1.8,2)
PCD	**CBN**	
R/L F		
		
(1.5,1.8,2)	(1.5,1.8,2)	

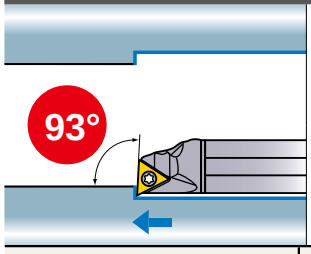
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
M-FSTUPR/L-051.5-C	●	●	TPMH TPGH NP-TPGB NP-TPGX	1.51.5○○	.313	5.000	.703	.196	.281	10°	**.390**	.016	TS2D	TKY06F
M-FSTUPR/L-061.8-C	●	●		1.81.5○○	.375	6.000	.844	.227	.336	8°	**.450**	.016	TS25D	TKY08F
M-FSTUPR/L-081.8-C	●	●		1.81.5○○	.500	8.000	1.125	.290	.461	7°	**.580**	.016	TS25D	TKY08F
M-FSTUPR/L-102-C	●	●		22○	.625	10.000	1.406	.352	.586	4°	**.700**	.016	TS31D	TKY10F
M-FSTUPR/L-122-C	●	●		22○	.750	10.000	1.688	.414	.711	0°	**.825**	.016	TS31D	TKY10F

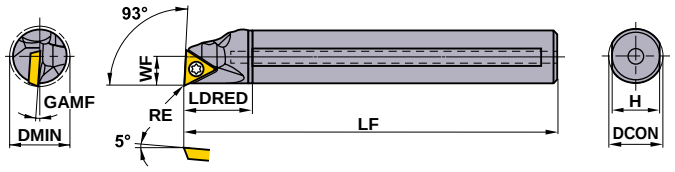
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS2D=5.3, TS25D=8.9, TS31D=22

S-FSTUP

Steel shank coolant through — **TP○○inserts**





Right hand tool holder shown.

Finish	Light	Medium
FV	SV	MV
		
(1.8,2)	(1.8,2)	(1.8,2)
PCD	**CBN**	
R/L F		
		
(1.8,2)	(1.8,2)	

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
S-FSTUPR/L-061.8-C	●	●	TPMH TPGH NP-TPGB NP-TPGX	1.81.5○○	.375	6.000	.844	.227	.336	8°	**.450**	.016	TS25D	TKY08F
S-FSTUPR/L-081.8-C	●	●		1.81.5○○	.500	8.000	1.125	.290	.461	7°	**.580**	.016	TS25D	TKY08F
S-FSTUPR/L-102-C	●	●		22○	.625	10.000	1.406	.352	.586	4°	**.700**	.016	TS31D	TKY10F
S-FSTUPR/L-122-C	●	●		22○	.750	10.000	1.688	.414	.711	0°	**.825**	.016	TS31D	TKY10F
S-FSTUPR/L-162-C	●	●		22○	1.000	12.000	2.250	.638	.937	0°	**1.280**	.016	TS31D	TKY10F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS25D=8.9, TS31D=22

TP○○ type inserts	➤ A159–A161
CBN & PCD inserts	➤ B042, B043, B058, B059

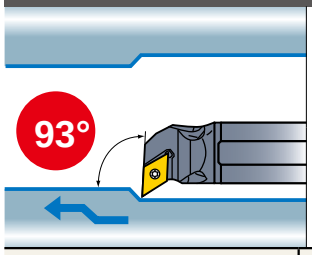
CUTTING CONDITIONS	➤ E011
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

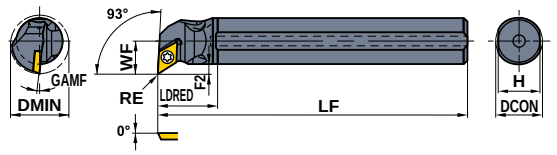
SCREW CLAMP DIMPLE BAR

- Excellent vibration resistance due to light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- l/d is 3 to 6 times the diameter.

M-FSDUC

Heavy metal shank coolant through **DC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	Medium	PCD	CBN
MP	MM	R/L F	
			
(2,3)	(2,3)	(2,3)	(2,3)

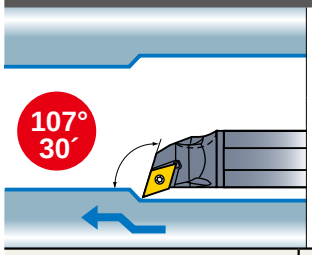
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	F2	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
M-FSDUCR/L-062-C	●	●	DCMT DCET DCGT NP-DCMW NP-DCGW	21.5○	.375	6.000	.675	.317	.130	.336	7.5°	**.525**	.016	TS25	TKY08F
M-FSDUCR/L-082-C	●	●		21.5○	.500	8.000	.833	.380	.130	.461	6°	**.667**	.016	TS25	TKY08F
M-FSDUCR/L-102-C	●	●		21.5○	.625	10.000	.781	.442	.130	.586	5°	**.781**	.016	TS25	TKY08F
M-FSDUCR/L-123-C	●	●		32.5○	.750	10.000	.844	.615	.240	.711	5°	**1.200**	.031	TS43	TKY15F

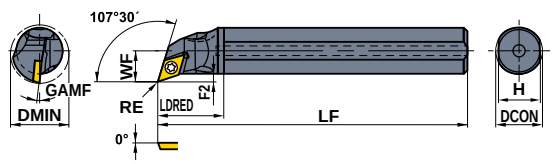
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS25=8.9, TS43=31

M-FSDQC

Heavy metal shank coolant through **DC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	Medium	PCD	CBN
MP	MM	R/L F	
			
(2,3)	(2,3)	(2,3)	(2,3)

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	F2	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
M-FSDQCR/L-062-C	●	●	DCMT DCET DCGT NP-DCMW NP-DCGW	21.5○	.375	6.000	.769	.290	.102	.336	8°	**.488**	.016	TS25	TKY08F
M-FSDQCR/L-082-C	●	●		21.5○	.500	8.000	.938	.352	.102	.461	6°	**.667**	.016	TS25	TKY08F
M-FSDQCR/L-102-C	●	●		21.5○	.625	10.000	.879	.415	.102	.586	5°	**.781**	.016	TS25	TKY08F
M-FSDQCR/L-123-C	●	●		32.5○	.750	10.000	.975	.521	.146	.711	7°	**.938**	.031	TS43	TKY15F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS25=8.9, TS43=31

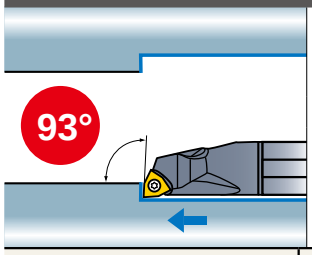
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

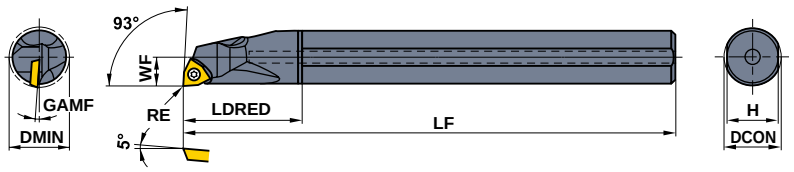
DC○○ type inserts ➤ **A144–A149**
CBN & PCD inserts ➤ **B039, B040, B056**

● : **Inventory maintained.**

M-FSWUB/P

Heavy metal shank coolant through — **WB○○inserts, WP○○inserts**





The ϕ.313 and ϕ.375 shanks are 0°.

Right hand tool holder shown.

Finish
R/L F

(1.5,2,3)
Medium
MV

(1.5,2,3)

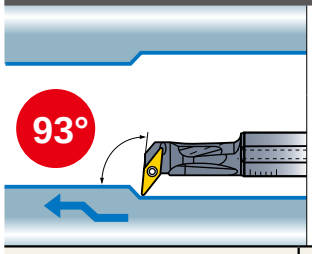
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
M-FSWUBR/L-051.5-C	●	●	WBMT WBGT	1.51.5○	.313	5.000	.703	.196	.281	14°	**.391**	.008	TS2	TKY06F
M-FSWUBR/L-061.5-C	●	●	WBMT WBGT	1.51.5○	.375	6.000	.844	.227	.336	11°	**.450**	.008	TS2	TKY06F
M-FSWUPR/L-082-C	●	●	WPMT	21.5○	.500	8.000	1.125	.289	.461	4°	**.583**	.016	TS253	TKY08F
M-FSWUPR/L-102-C	●	●	WPMT	21.5○	.625	10.000	1.406	.352	.586	1°	**.703**	.016	TS253	TKY08F
M-FSWUPR/L-123-C	●	●	WPMT	32○	.750	10.000	1.688	.414	.711	2°	**.825**	.031	TS4	TKY15F

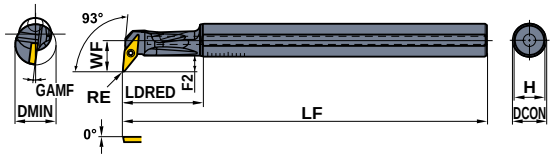
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS2=5.3, TS253=8.9, TS4=31

M-FSVUB/C

Heavy metal shank coolant through — **VC○○inserts, VB○○inserts**





Right hand tool holder shown.

Finish
R/L F

(1.5,2)
Medium
MV

(1.5,2)

Finish
FM

(1.5,2)
Medium
LM

(1.5,2)

Light
LP

(1.5,2)
CBN

(2)

Light
SV

(1.5,2)

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	F2	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
M-FSVUCR/L-081.5-C	●	●	VCGT VCMT	1.51.5○	.500	8.000	1.042	.447	.197	.461	8°	**.667**	.016	TS202	TKY06F
M-FSVUBR/L-102-C	●	●	VBGT VBMT	22○	.625	10.000	1.269	.608	.295	.586	8°	**.781**	.016	TS255	TKY08F
M-FSVUBR/L-122-C	●	●	NP-VBGW	22○	.750	10.000	1.519	.670	.295	.711	7°	**.938**	.016	TS255	TKY08F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS202=5.3, TS255=8.9

WB○○ type inserts ➤ A170
WP○○ type inserts ➤ A172
VC○○ type inserts ➤ A166, A167
VB○○ type inserts ➤ A162–A165
CBN & PCD inserts ➤ B044, B060

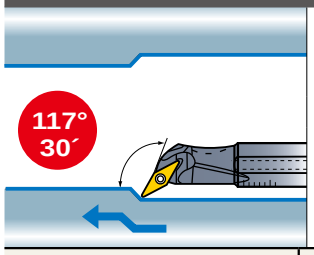
CUTTING CONDITIONS ➤ E011

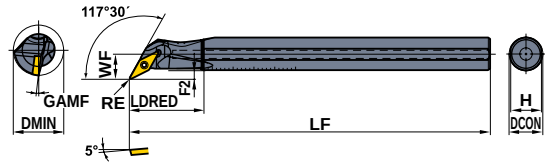
SCREW CLAMP DIMPLE BAR

- Excellent vibration resistance due to light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- l/d is 3 to 6 times the diameter.

M-FSVPB/C

Heavy metal shank coolant through **VC○○inserts, VB○○inserts**





Right hand tool holder shown.

Finish	Finish	Finish	Light
FV	FP	FM	SV
			
(1.5)	(1.5)	(2)	(1.5)
Light	**Medium**	**Medium**	**CBN**
LP	MV	LM	
			
(2)	(1.5)	(2)	(2)

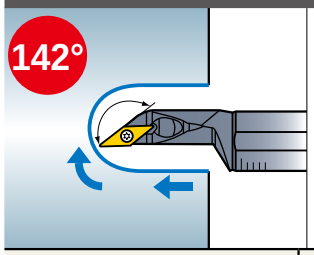
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	F2	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
M-FSVPCR/L-061.5-C	●	●	VCGT VCMT	1.51.5○	.375	6.000	.938	.306	.118	.336	8°	**.600**	.016	TS202	TKY06F
M-FSVPBR/L-082-C	●	●	VBGT VBMT NP-VBGW	22○	.500	8.000	1.167	.407	.157	.461	8°	**.833**	.016	TS255	TKY08F
M-FSVPBR/L-102-C	●	●		22○	.625	10.000	1.367	.490	.177	.586	5°	**.977**	.016	TS255	TKY08F
M-FSVPBR/L-122-C	●	●		22○	.750	10.000	1.500	.572	.197	.711	5°	**1.125**	.016	TS255	TKY08F

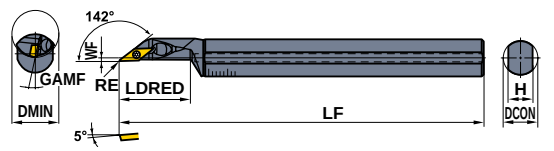
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS202=5.3, TS255=8.9

M-FSVJB/C

Heavy metal shank coolant through **VC○○inserts, VB○○inserts**





Right hand tool holder shown.

Finish	Finish	Finish	Light
FV	FP	FM	SV
			
(1.5)	(1.5)	(2)	(1.5)
Light	**Light**	**Medium**	
LP	LM	MV	
			
(2)	(2)	(1.5)	

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
M-FSVJCR/L-081.5-C	●	●	VCGT VCMT	1.51.5○	.500	8.000	1.083	.093	.461	5°	**.667**	.016	TS202	TKY06F
M-FSVJCR/L-101.5-C	●	●		1.51.5○	.625	10.000	1.406	.076	.586	5°	**.781**	.016	TS202	TKY06F
M-FSVJBR/L-122-C	●	●	VBET VBGT VBMT	22○	.750	10.000	1.406	.060	.711	5°	**.938**	.016	TS255	TKY08F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS202=5.3, TS255=8.9

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

VC○○ type inserts	**➤ A166, A167**
VB○○ type inserts	**➤ A162–A165**
CBN & PCD inserts	**➤ B044, B060**

● : **Inventory maintained.**

RECOMMENDED CUTTING CONDITIONS

Steel Shank						l/d ≤ 3		3 < l/d ≤ 5	
Heavy Metal Shank						l/d ≤ 3		3 < l/d ≤ 6	
	Work Material	Cutting Mode	Breaker	Recom-mendation	Grade	Cutting Speed (SFM)	Feed (IPR)	D.O.C. (inch)	Feed (IPR)	D.O.C. (inch)
P	Mild Steel <180HB	Finishing	FV	①	NX2525	555 (390—720)	.004 (.002—.006)	—.020	.004 (.002—.006)	—.020
		Light	SV	①	VP45N	460 (295—620)	.008 (.004—.010)	—.040	.006 (.002—.008)	—.040
				②	VP15TF	590 (425—755)	.008 (.004—.010)	—.040	.006 (.002—.008)	—.040
		Medium	MV	①	VP45N	425 (260—590)	.010 (.006—.014)	—.080	.008 (.006—.010)	—.060
				②	VP15TF	525 (360—690)	.010 (.006—.014)	—.080	.008 (.006—.010)	—.060
	Carbon Steel Alloy Steel 180—280HB	Finishing	FV	①	VP15TF	460 (295—620)	.004 (.002—.006)	—.020	.004 (.002—.006)	—.020
				②	NX2525	425 (260—590)	.004 (.002—.006)	—.020	.004 (.002—.006)	—.020
		Light	SV	①	VP15TF	425 (260—590)	.008 (.004—.010)	—.040	.006 (.002—.008)	—.040
				②	UE6020	460 (295—620)	.008 (.004—.010)	—.040	.006 (.002—.008)	—.040
		Medium	MV	①	VP15TF	390 (230—555)	.010 (.006—.014)	—.080	.008 (.006—.010)	—.060
				②	UE6020	425 (260—590)	.010 (.006—.014)	—.080	.008 (.006—.010)	—.060
M	Stainless Steel 180—280HB	Finishing	FV	①	VP15TF	490 (360—620)	.004 (.002—.006)	—.020	.004 (.002—.006)	—.020
		Light	SV	①	US7020	490 (360—620)	.008 (.004—.010)	—.040	.006 (.002—.008)	—.040
				②	VP15TF	425 (295—555)	.008 (.004—.010)	—.040	.006 (.002—.008)	—.040
		Medium	MV	①	US7020	460 (330—590)	.008 (.006—.010)	—.080	.008 (.006—.010)	—.040
				②	VP15TF	390 (260—525)	.008 (.006—.010)	—.080	.008 (.006—.010)	—.040
K	Cast Iron Tensile Strength<350MPa	Finishing	F/FS	①	HTi10	425 (295—525)	.006 (.004—.008)	—.020	.006 (.004—.008)	—.020
		Medium	MV	①	VP15TF	295 (195—390)	.008 (.006—.010)	—.080	.008 (.006—.010)	—.060
N	Aluminium Alloy	Finishing	F/FS	①	HTi10	985 (655—1310)	.004 (.002—.006)	—.020	.004 (.002—.006)	—.020
			No Breaker	①	MD220	655 (490—820)	.004 (.002—.006)	—.080	.004 (.002—.006)	—.040
H	Heat Treated Steel 35—65HRC	Finishing	No Breaker	①	MB825	330 (260—655)	.004 (.002—.006)	—.006	.004 (.002—.006)	—.004

★ If the DIMPLE BAR vibrates, reduce cutting speed to 70% of the above.

CCG/MT, CPGT, CPMX, TPGD/P, TPGA/M, TPMX inserts

- **By changing the insert screw, it is possible to use the inserts listed on the left hand side.**

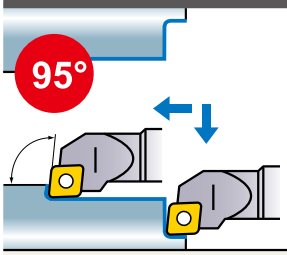
Order Number	Insert Screw	Remark
CCG/MT21.5○	Can be used as it is.	If the screw is too long then please grind away the unnecessary material.
CPGT2.51.5○	Change to TS3.	
CPGT32○	Change to TS4.	
CPMX2.51.5○	Can be used as it is.	
CPMX32○	Can be used as it is.	
TPGD/P1.51.5○	Change to CS200T.	
TPGD/P1.81.5○	Change to CS250T.	
TPGA/M22○	Change to CS300890T.	
TPMX1.51.5○	Change to CS200T.	
TPMX1.81.5○	Change to CS250T.	
TPMX22○	Change to CS300890T.	

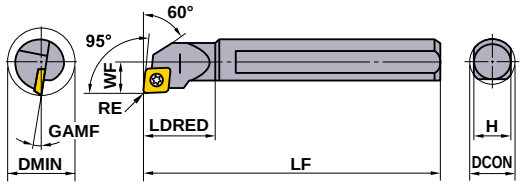
SCREW CLAMP TYPE

- Two wall pocket.
- 7º positive insert, low cutting force.
- Screw-on type.
- Steel and carbide shanks are stocked in various diameters.

S-SCLC

Steel shank — **CC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	Medium	Flat Top	PCD/CBN
MP	MM		
			
(2,3,4)	(2,3,4)	(2,3,4)	(2,3,4)

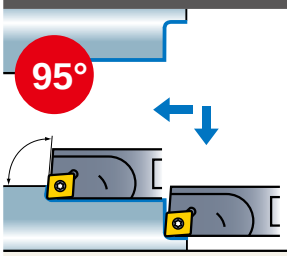
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
S-SCLCR/L-062	●	●	CCMT CCMW CCGW CCGT CCET CCMH NP-CCGW	21.5○	.375	6.000	.625	.250	.340	15°	**.477**	.016	TS25	TKY08F
S-SCLCR/L**-082**	●	●		21.5○	.500	6.000	.750	.313	.460	13°	**.602**	.016	TS25	TKY08F
S-SCLCR/L**-103**	●	●		32.5○	.625	8.000	1.250	.406	.560	10°	**.797**	.031	TS4	TKY15F
S-SCLCR/L**-123**	●	●		32.5○	.750	10.000	1.875	.500	.700	8°	**.954**	.031	TS4	TKY15F
S-SCLCR/L**-164**	●	●		43○	1.000	12.000	2.500	.641	.910	7°	**1.219**	.031	TS5	TKY25F
S-SCLCR/L**-204**	●	●		43○	1.250	12.000	2.500	.875	1.160	5°	**1.579**	.031	TS5	TKY25F

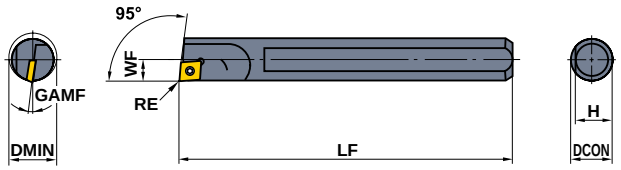
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31, TS5=66

M-SCLC

Heavy metal shank — **CC○○inserts**





Right hand tool holder only.

Finish L F

(03,04)
PCD/CBN

(03,04)

Order Number	Stock R	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
M-SCLCR-063	●	CCGT NP-CCMW	03S1○○	.188	3.000	.100	.173	15°	**.200**	.008	TS16	TKY06F
M-SCLCR**-073**	●		03S1○○	.219	3.500	.120	.199	14°	**.240**	.008	TS16	TKY06F
M-SCLCR**-064**	●		04T0○○	.250	4.000	.140	.230	14°	**.280**	.008	TS21	TKY06F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS16=5.3, TS21=5.3

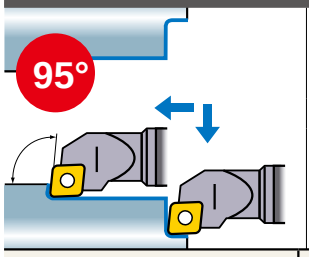
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

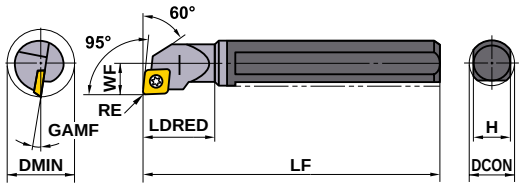
CC○○ type inserts	**➤ A136–A141**
CBN & PCD inserts	**➤ B036, B037, B055**

● : **Inventory maintained.**

C-SCLC

Carbide shank — **CC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	Medium	Flat Top	CBN
MP	MM		
			
(2,3)	(2,3)	(2,3)	(2,3)

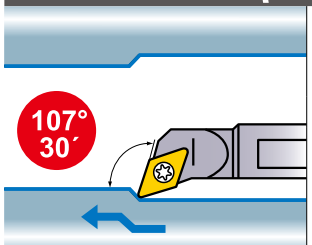
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
C-SCLCR/L-062	●	●	CCMT CCMW CCGW CCGT CCET NP-CCGW CCMH	21.5○	.375	6.000	.625	.250	.340	15°	**.477**	.016	TS25	TKY08F
C-SCLCR/L-082	●	●		21.5○	.500	6.000	.750	.313	.460	13°	**.602**	.016	TS25	TKY08F
C-SCLCR/L-103	●	●		32.5○	.625	8.000	1.250	.406	.560	10°	**.797**	.031	TS4	TKY15F

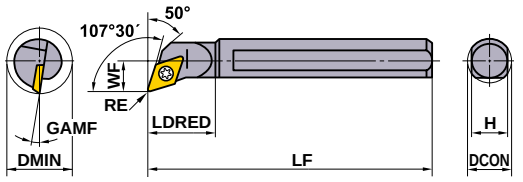
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

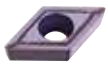
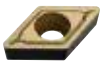
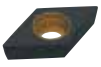
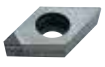
S-SDQC

Steel shank — **DC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	Medium	Flat Top	PCD/CBN
MP	MM		
			
(2,3,4)	(2,3,4)	(2,3,4)	(2,3)

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
S-SDQCR/L-082	●	●	DCMT DCMW DCGW DCGT DCET NP-DCMW NP-DCMT	21.5○	.500	6.000	.875	.375	.460	10°	**.665**	.016	TS25	TKY08F
S-SDQCR/L-102	●	●		21.5○	.625	8.000	1.000	.406	.560	7°	**.797**	.016	TS25	TKY08F
S-SDQCR/L-123	●	●		32.5○	.750	10.000	1.250	.500	.700	7°	**.954**	.031	TS4	TKY15F
S-SDQCR/L-164	●	●		43○	1.000	12.000	1.500	.641	.910	5°	**1.219**	.031	TS5	TKY25F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31, TS5=66

RECOMMENDED CUTTING CONDITIONS

Steel Shank	l/d ≤ 3	3 < l/d ≤ 4 (Shank Diameter ≥ 1.000inch)
Heavy Metal Shank	l/d ≤ 3	3 < l/d ≤ 6
Carbide Shank	l/d ≤ 5	5 < l/d ≤ 7

	Work Material	Hardness	Cutting Mode	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P	Carbon Steel Alloy Steel	180–280HB	Light Cutting	295–525	.002–.006	.008	260–490	.002–.006	.008
			Medium Cutting	195–395	.006–.014	–.118	165–360	.004–.008	.059
M	Stainless Steel	≤200HB	Light Cutting	330–590	.002–.006	.008	330–590	.002–.006	.008
			Medium Cutting	165–295	.006–.010	–.079	130–260	.004–.008	.039
N	Aluminum Alloy	–	Light Cutting	655–1310	.002–.006	.008	655–1310	.002–.006	.008
			Medium Cutting	490–820	.002–.006	–.079	490–820	.002–.006	.059

CC○○ type inserts ➤ **A136–A141**
DC○○ type inserts ➤ **A144–A149**
CBN & PCD inserts ➤ **B036, B037, B039, B040, B055, B056**

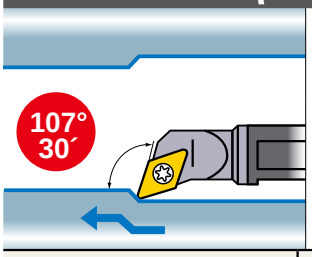
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

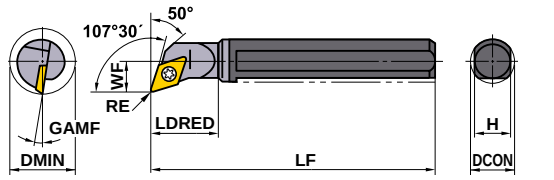
SCREW CLAMP TYPE

- Two wall pocket.
- 7º positive insert, low cutting force.
- Screw-on type.
- Steel and carbide shanks are stocked in various diameters.

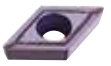
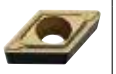
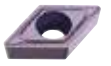
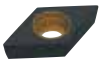
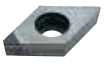
C-SDQC

Carbide shank **DC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	Medium	Flat Top	PCD/CBN
MP	MM		
			
(2,3,4)	(2,3,4)	(2,3,4)	(2,3)

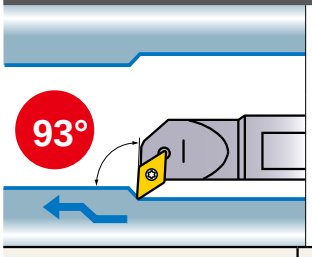
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
C-SDQCR/L-082	●	●	DCMT DCMW DCGW DCGT DCET NP-DCMW NP-DCMT	21.5○	.500	6.000	.875	.375	.460	10°	**.665**	.016	TS25	TKY08F
C-SDQCR/L-102	●	●		21.5○	.625	8.000	1.000	.406	.560	7°	**.797**	.016	TS25	TKY08F
C-SDQCR/L-123	●	●		32.5○	.750	10.000	1.250	.500	.700	7°	**.954**	.031	TS4	TKY15F

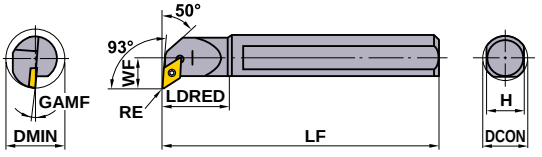
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

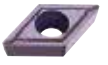
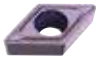
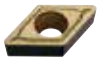
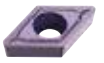
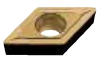
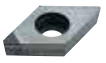
S-SDUC

Steel shank **DC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	Medium	Medium	PCD/CBN
MP	MM	Standard	
			
(2,3,4)	(2,3,4)	(2,3,4)	(2,3)

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
S-SDUCR/L-062	●	●	DCMT DCMW DCGW DCGT DCET NP-DCMW NP-DCMT	21.5○	.375	6.000	.625	.437	.340	7°	**.664**	.016	TS25	TKY08F
S-SDUCR/L-082	●	●		21.5○	.500	6.000	.750	.500	.460	7°	**.789**	.016	TS25	TKY08F
S-SDUCR/L-102	●	●		21.5○	.625	8.000	1.250	.563	.560	7°	**.954**	.016	TS25	TKY08F
S-SDUCR/L-123	●	●		32.5○	.750	10.000	1.875	.625	.700	7°	**1.079**	.031	TS4	TKY15F
S-SDUCR/L-164	●	●		43○	1.000	12.000	2.500	.750	.910	5°	**1.329**	.031	TS5	TKY25F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31, TS5=66

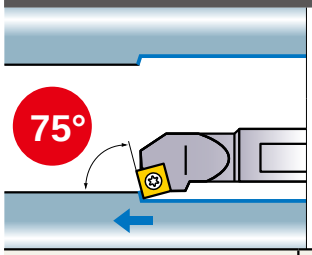
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

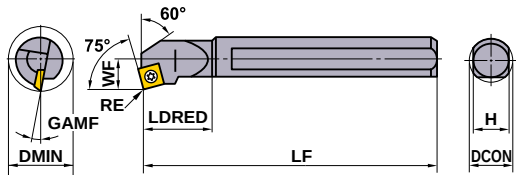
DC○○ type inserts ➤ A144–A149
CBN & PCD inserts ➤ B039, B040, B056

● : Inventory maintained.

S-SSKC

Steel shank — **SC○○inserts**





Right hand tool holder shown.

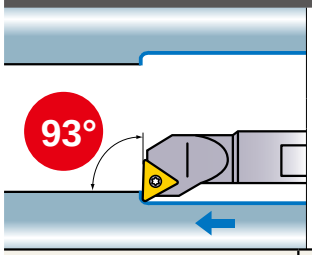
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(3)	(3)	(3)	(3)
Medium	**Medium**	**Medium**	**Flat Top**
MP	MM	Standard	
			
(3,4)	(3,4)	(3,4)	(3,4)

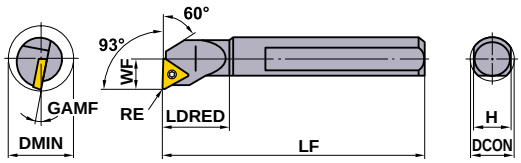
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
S-SSKCR/L-103	●	●	SCMT SCMW	32.5○	.625	8.000	1.250	.406	.560	10°	**.797**	.031	TS4	TKY15F
S-SSKCR/L**-123**	●	●		32.5○	.750	10.000	1.875	.500	.700	8°	**.954**	.031	TS4	TKY15F
S-SSKCR/L**-164**	●	●		43○	1.000	12.000	2.500	.641	.910	7°	**1.219**	.031	TS5	TKY25F

* Clamp Torque (lbf-in) : TS4=31, TS5=66

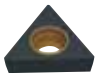
S-STUC

Steel shank — **TC○○inserts**





Right hand tool holder shown.

Finish	Finish
FV	FJ
	
(2,3)	(2,3)
Medium	**Flat Top**
Standard	
	
(2,3)	(2,3)

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
S-STUCR/L-062	●	●	TCMT TCMW TCGT NP-TCGW	21.5○	.375	6.000	.625	.250	.340	15°	**.477**	.016	TS25	TKY08F
S-STUCR/L**-082**	●	●		21.5○	.500	6.000	.750	.313	.460	13°	**.602**	.016	TS25	TKY08F
S-STUCR/L**-102**	●	●		21.5○	.625	8.000	1.250	.406	.560	10°	**.797**	.016	TS25	TKY08F
S-STUCR/L**-123**	●	●		32.5○	.750	10.000	1.875	.500	.700	8°	**.954**	.031	TS4	TKY15F
S-STUCR/L**-163**	●	●		32.5○	1.000	12.000	2.500	.641	.910	7°	**1.219**	.031	TS4	TKY15F
S-STUCR/L**-203**	●	●		32.5○	1.250	12.000	2.500	.875	1.160	5°	**1.579**	.031	TS4	TKY15F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

RECOMMENDED CUTTING CONDITIONS

			Steel Shank	Heavy Metal Shank	Carbide Shank	Steel Shank	Heavy Metal Shank	Carbide Shank
			l/d ≤ 3	l/d ≤ 3	l/d ≤ 5	3 < l/d ≤ 4 (Shank Diameter ≥ 1.000inch)	3 < l/d ≤ 6	5 < l/d ≤ 7
	Work Material	Hardness	Cutting Mode	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P	Carbon Steel Alloy Steel	180–280HB	Light Cutting	295–525	.002–.006	.008	260–490	.002–.006	.008
			Medium Cutting	195–395	.006–.014	–.118	165–360	.004–.008	.059
M	Stainless Steel	≤200HB	Light Cutting	330–590	.002–.006	.008	330–590	.002–.006	.008
			Medium Cutting	165–295	.006–.010	–.079	130–260	.004–.008	.039
N	Aluminum Alloy	–	Light Cutting	655–1310	.002–.006	.008	655–1310	.002–.006	.008
			Medium Cutting	490–820	.002–.006	–.079	490–820	.002–.006	.059

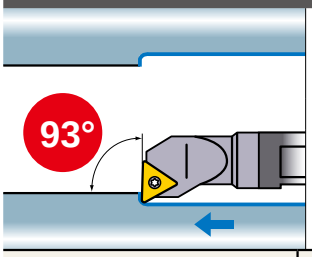
SC○○ type inserts ➤ A152, A153
TC○○ type inserts ➤ A155–A157
CBN & PCD inserts ➤ B041, B057
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

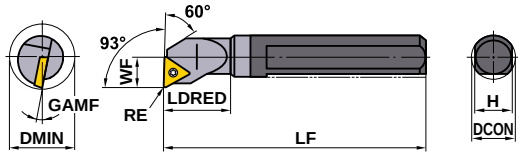
SCREW CLAMP TYPE

- Two wall pocket.
- 7º positive insert, low cutting force.
- Screw-on type.
- Steel and carbide shanks are stocked in various diameters.

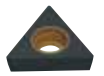
C-STUC

Carbide shank — **TC○○inserts**





Right hand tool holder shown.

Finish	Finish
FV	FJ
	
(2)	(2)
Medium	Flat Top
Standard	
	
(2)	(2)

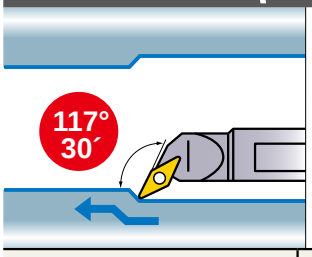
Order Number	Stock R	Stock L	Insert Number		DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
C-STUCR/L-062	●	●	TCMT TCMW TCGT	21.5○	.375	6.000	.625	.250	.340	15°	**.477**	.016	TS25	TKY08F
C-STUCR/L-082	●	●		21.5○	.500	6.000	.750	.313	.460	13°	**.602**	.016	TS25	TKY08F
C-STUCR/L-102	●	●	NP-TCGW	21.5○	.625	8.000	1.250	.406	.560	10°	**.797**	.016	TS25	TKY08F

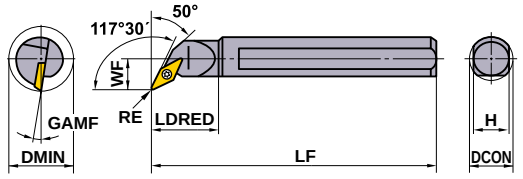
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS25=8.9

S-SVQC

Steel shank — **VC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	Medium	Medium	Flat Top
MP	MM	Standard	
			
(3)	(3)	(2,3)	(2,3)

Order Number	Stock R	Stock L	Insert Number		DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
S-SVQCR/L-102	●	●	VCMT VCMW NP-VCGW	22○	.625	8.000	1.000	.406	.560	8°	**.797**	.016	TS25	TKY08F
S-SVQCR/L-122	●	●		22○	.750	10.000	1.250	.500	.700	7°	**.954**	.016	TS25	TKY08F
S-SVQCR/L-163	●	●		33○	1.000	12.000	1.500	.641	.910	6°	**1.219**	.031	TS4	TKY15F

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

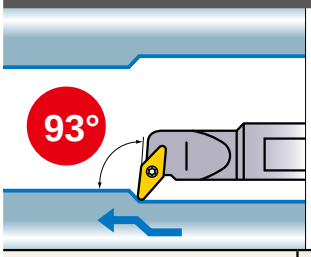
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

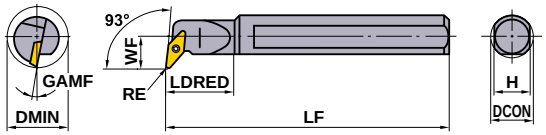
TC○○ type inserts	**➤ A155–A157**
VC○○ type inserts	**➤ A166, A167**
CBN & PCD inserts	**➤ B041, B045, B057, B060**

● : **Inventory maintained.**

S-SVUC

Steel shank — **VC○○inserts**





Right hand tool holder shown.

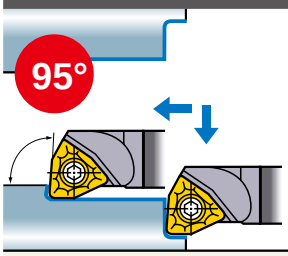
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Medium**	**Flat Top**
MP	MM	Standard	
			
(3)	(3)	(2,3)	(2,3)

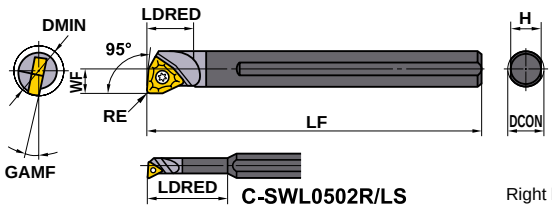
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
S-SVUCR/L-122	●	●	VCMT VCMW NP-VCGW	22○	.750	10.000	1.250	.500	.700	7°	**1.000**	.016	TS25	TKY08F
S-SVUCR/L-163	●	●		33○	1.000	12.000	1.500	.641	.910	6°	**1.281**	.031	TS4	TKY15F

∗ Clamp Torque (lbf-in) : TS25=8.9, TS4=31

C-SWL

Carbide shank — **WC○○inserts**





C-SWL0502R/LS
C-SWL05S3R/LM

Right hand tool holder shown.

Finish	Finish	Light
FJ	R/L	Standard
		
(2)	(1.2,1.5)	(1.2,1.5,2)
Medium	**CBN**	
MJ		
		
(2)	(1.5,2)	

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
C-SWL0502R/LS	●	●	WCMT WCGT NP-WCMW NP-WCGW	1.21○	.313	5.000	1.000	.114	.282	17°	**.228**	.016	TS21	TKY06F
C-SWL05S3R/LM	●	●		1.51.5○	.313	5.000	1.370	.156	.282	15°	**.312**	.016	TS2	TKY06F
C-SWL0504R/L	●	●		21.5○	.313	5.000	.598	.203	.282	15°	**.406**	.016	TS25	TKY08F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

∗ Clamp Torque (lbf-in) : TS21=5.3, TS2=5.3, TS25=8.9

RECOMMENDED CUTTING CONDITIONS

Steel Shank	l/d ≤ 3	3 < l/d ≤ 4 (Shank Diameter ≥ 1.000inch)
Heavy Metal Shank	l/d ≤ 3	3 < l/d ≤ 6
Carbide Shank	l/d ≤ 5	5 < l/d ≤ 7

	Work Material	Hardness	Cutting Mode	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P	Carbon Steel Alloy Steel	180−280HB	Light Cutting	295−525	.002−.006	.008	260−490	.002−.006	.008
			Medium Cutting	195−395	.006−.014	−.118	165−360	.004−.008	.059
M	Stainless Steel	≤200HB	Light Cutting	330−590	.002−.006	.008	330−590	.002−.006	.008
			Medium Cutting	165−295	.006−.010	−.079	130−260	.004−.008	.039
N	Aluminum Alloy	−	Light Cutting	655−1310	.002−.006	.008	655−1310	.002−.006	.008
			Medium Cutting	490−820	.002−.006	−.079	490−820	.002−.006	.059

VC○○ type inserts ➤ A166, A167
WC○○ type inserts ➤ A171
CBN & PCD inserts ➤ B045, B046, B060, B061

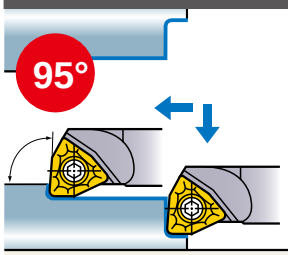
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

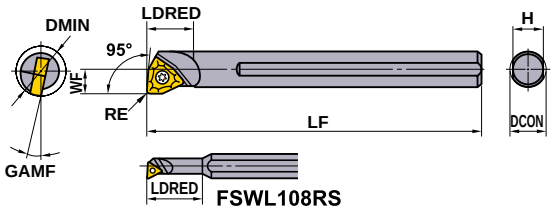
SCREW CLAMP TYPE

- Two wall pocket.
- 7º positive insert, low cutting force.
- Screw-on type.
- Steel and carbide shanks are stocked in various diameters.

FSWL1

Steel shank — **WC○○inserts**





FSWL108RS

Right hand tool holder only.

Finish	Finish	Light
FJ	R/L	Standard
		
(2,3)	(1.2)	(1.2,2,3)
Medium	**CBN**	
MJ		
		
(2,3)	(2,3)	

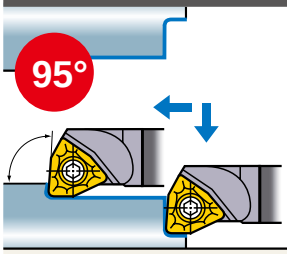
Order Number	Stock R	Insert Number		Dimensions (mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE (inch)	* Clamp Screw	Wrench
FSWL108RS	★	WCMT WCGT	1.21○	8	100	19	2.9	7	17°	**5.8**	.016	TS21	TKY06F
FSWL**108RM**	★	WCMT WCGT WCMW	1.51.5○	8	100	25	4	7	15°	**8**	.016	TS2	TKY06F
FSWL**108R**	★	WCMT	21.5○	8	125	10	5	7	15°	**10**	.016	TS25	TKY08F
FSWL**110R**	★	NP-WCGW	21.5○	10	150	12	6	9	13°	**12**	.016	TS25	TKY08F
FSWL**112R**	★	NP-WCMW	32.5○	12	180	15	8	11	13°	**16**	.031	TS4	TKY15F

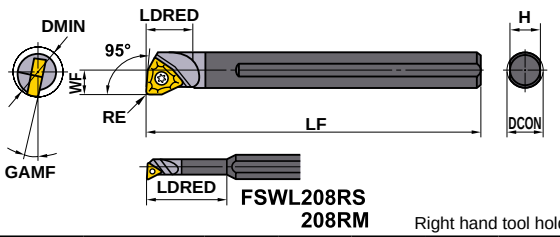
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS21=5.3, TS25=8.9, TS4=31

FSWL2

Carbide shank — **WC○○inserts**





FSWL208RS
208RM

Right hand tool holder only.

Finish	Finish	Light
FJ	R/L	Standard
		
(2,3)	(1.2,1.5)	(1.2,2,3)
Medium	**CBN**	
MJ		
		
(2,3)	(2,3)	

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE (inch)	* Clamp Screw	Wrench
FSWL208RS	★		WCMT WCGT	1.21○	8	122	25	2.9	7	17°	**5.8**	.016	TS21	TKY06F
FSWL**208R/LM**	★	★		1.51.5○	8	125	33	4	7	15°	**8**	.016	TS2	TKY06F
FSWL**208R**	★			21.5○	8	125	10	5	7	15°	**10**	.016	TS25	TKY08F
FSWL**210R/L**	★	★	WCMT WCMW	21.5○	10	150	12	6	9	13°	**12**	.016	TS25	TKY08F
FSWL**212R/L**	★	★	NP-WCGW NP-WCMW	32.5○	12	180	15	8	11	13°	**16**	.031	TS4	TKY15F
FSWL**216R/L**	★	★	WCMT WCMW	32.5○	16	200	20	11	14	7°	**22**	.031	TS4	TKY15F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS21=5.3, TS2=5.3, TS25=8.9, TS4=31

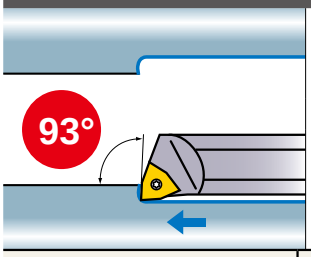
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

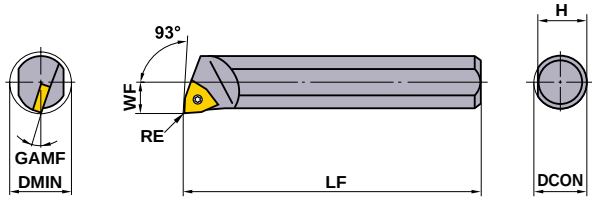
● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.

WC○○ type inserts ➤ A171
CBN & PCD inserts ➤ B046, B061

S-SWUC

Steel shank — **WC○○inserts**





Right hand tool holder shown.

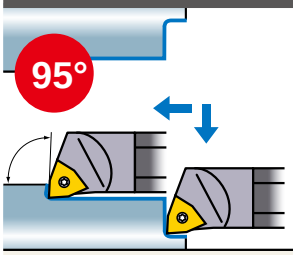
Finish	Finish	Light
FJ	R/L	Standard
		
(2,3)	(1.2,1.5)	(1.2,1.5,2,3)
Medium	**CBN**	
MJ		
		
(2,3)	(1.5,2,3)	

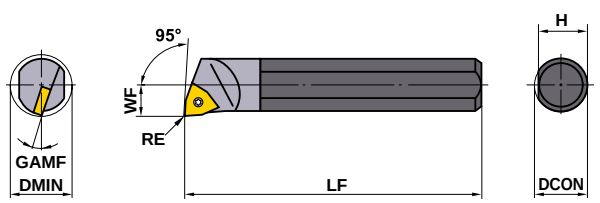
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
S-SWUCR/L-055	●	●	WCMT WCGT NP-WCMW NP-WCGW	1.21○	.188	4.000	.114	.172	17°	**.228**	.016	TS21	TKY06F
S-SWUCR/L**-065**	●	●		1.21○	.250	4.000	.156	.235	17°	**.312**	.016	TS2	TKY06F
S-SWUCR/L**-066**	●	●		1.51.5○	.313	6.000	.188	.295	15°	**.375**	.016	TS2	TKY06F
S-SWUCR/L**-062**	●	●		21.5○	.375	6.000	.250	.358	15°	**.500**	.016	TS25	TKY08F
S-SWUCR/L**-082**	●	●		21.5○	.500	6.000	.312	.480	13°	**.625**	.016	TS25	TKY08F
S-SWUCR/L**-103**	●	●		32.5○	.625	8.000	.375	.593	10°	**.750**	.031	TS4	TKY15F
S-SWUCR/L**-123**	●	●		32.5○	.750	10.000	.500	.725	8°	**1.000**	.031	TS4	TKY15F
S-SWUCR/L**-163**	●	●		32.5○	1.000	12.000	.640	.975	7°	**1.250**	.031	TS4	TKY15F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.
* Clamp Torque (lbf-in) : TS21=5.3, TS2=5.3, TS25=8.9, TS4=31

C-SWLO

Carbide shank — **WC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light
FJ	R/L	Standard
		
(2)	(1.2,1.5)	(1.2,1.5,2)
Medium	**CBN**	
MJ		
		
(2)	(1.5,2)	

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
C-SWLOR/L-055	●	□	WCMT WCGT NP-WCMW NP-WCGW	1.21○	.188	4.000	.114	.172	17°	**.228**	.016	TS21	TKY06F
C-SWLOR/L**-065**	●	□		1.21○	.250	4.000	.156	.235	17°	**.313**	.016	TS2	TKY06F
C-SWLOR/L**-066**	●	□		1.51.5○	.313	6.000	.188	.295	15°	**.375**	.016	TS2	TKY06F
C-SWLOR/L**-070**	●	□		21.5○	.375	6.000	.218	.358	15°	**.438**	.016	TS25	TKY08F
C-SWLOR/L**-062**	●	□		21.5○	.375	6.000	.250	.358	15°	**.500**	.016	TS25	TKY08F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.
* Clamp Torque (lbf-in) : TS21=5.3, TS2=5.3, TS25=8.9

RECOMMENDED CUTTING CONDITIONS

Steel Shank				l/d ≤ 3			3 < l/d ≤ 4 (Shank Diameter ≥ 1.000inch)		
Heavy Metal Shank				l/d ≤ 3			3 < l/d ≤ 6		
Carbide Shank				l/d ≤ 5			5 < l/d ≤ 7		
	Work Material	Hardness	Cutting Mode	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P	Carbon Steel Alloy Steel	180–280HB	Light Cutting	295–525	.002–.006	.008	260–490	.002–.006	.008
			Medium Cutting	195–395	.006–.014	–.118	165–360	.004–.008	.059
M	Stainless Steel	≤200HB	Light Cutting	330–590	.002–.006	.008	330–590	.002–.006	.008
			Medium Cutting	165–295	.006–.010	–.079	130–260	.004–.008	.039
N	Aluminum Alloy	–	Light Cutting	655–1310	.002–.006	.008	655–1310	.002–.006	.008
			Medium Cutting	490–820	.002–.006	–.079	490–820	.002–.006	.059

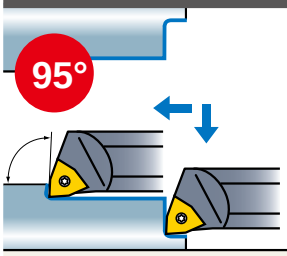
WC○○ type inserts ➤ A171
CBN & PCD inserts ➤ B046, B061
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

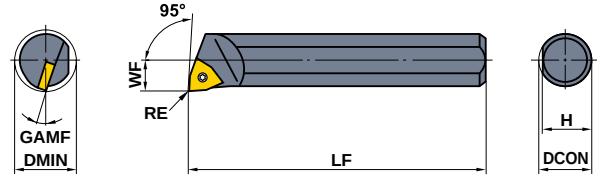
SCREW CLAMP TYPE

- Two wall pocket.
- 7º positive insert, low cutting force.
- Screw-on type.
- Steel and carbide shanks are stocked in various diameters.

M-SWLO

Heavy metal shank — **WC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light
FJ	R/L	Standard
		
(2,3)	(1.2,1.5)	(1.2,1.5,2,3)
Medium	**CBN**	
MJ		
		
(2,3)	(1.5,2,3)	

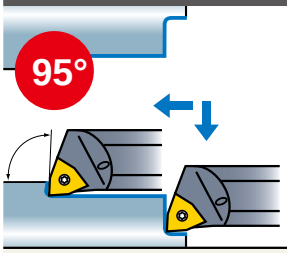
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
M-SWLOR/L-055	●	●	WCMT WCGT NP-WCMW NP-WCGW	1.21○	.188	4.000	.114	.172	17°	**.228**	.016	TS21	TKY06F
M-SWLOR/L-**065**	●	●		1.21○	.250	4.000	.156	.235	17°	**.313**	.016	TS2	TKY06F
M-SWLOR/L-**066**	●	●		1.51.5○	.313	6.000	.188	.295	15°	**.375**	.016	TS2	TKY06F
M-SWLOR/L-**070**	●	●		21.5○	.375	6.000	.218	.358	15°	**.438**	.016	TS25	TKY08F
M-SWLOR/L-**062**	●	●		21.5○	.375	6.000	.250	.358	15°	**.500**	.016	TS25	TKY08F
M-SWLOR/L-**082**	●	●		21.5○	.500	6.000	.312	.480	13°	**.625**	.016	TS25	TKY08F
M-SWLOR/L-**103**	●	●		32.5○	.625	8.000	.375	.593	10°	**.750**	.031	TS4	TKY15F
M-SWLOR/L-**123**	●	●		32.5○	.750	10.000	.500	.725	8°	**1.000**	.031	TS4	TKY15F
M-SWLOR/L-**163**	●			32.5○	1.000	12.000	.640	.975	7°	**1.250**	.031	TS4	TKY15F

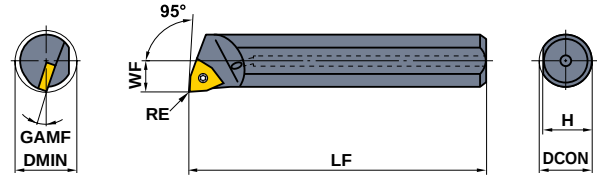
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS21=5.3, TS2=5.3, TS25=8.9, TS4=31

M-SWLO

Heavy metal shank coolant through — **WC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light
FJ	R/L	Standard
		
(2,3)	(1.5)	(1.5,2,3)
Medium	**CBN**	
MJ		
		
(2,3)	(1.5,2,3)	

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
M-SWLOR/L-066-C	●	●	WCMT WCGT NP-WCMW NP-WCGW	1.51.5○	.313	6.000	.188	.295	15°	**.375**	.016	TS2	TKY06F
M-SWLOR/L-**070-C**	●	●		21.5○	.375	6.000	.218	.358	15°	**.438**	.016	TS25	TKY08F
M-SWLOR/L-**062-C**	●	●		21.5○	.375	6.000	.250	.358	15°	**.500**	.016	TS25	TKY08F
M-SWLOR/L-**082-C**	●	●		21.5○	.500	6.000	.312	.480	13°	**.625**	.016	TS25	TKY08F
M-SWLOR/L-**103-C**	●	●		32.5○	.625	8.000	.375	.593	10°	**.750**	.031	TS4	TKY15F
M-SWLOR/L-**123-C**	●	●		32.5○	.750	10.000	.500	.725	8°	**1.000**	.031	TS4	TKY15F
M-SWLOR/L-**163-C**	●	●		32.5○	1.000	12.000	.640	.975	7°	**1.250**	.031	TS4	TKY15F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS2=5.3, TS25=8.9, TS4=31

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

CUTTING CONDITIONS	➤ E019
WC○○ type inserts	➤ A171
CBN & PCD inserts	➤ B046, B061

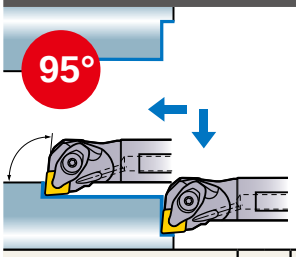
● : Inventory maintained.

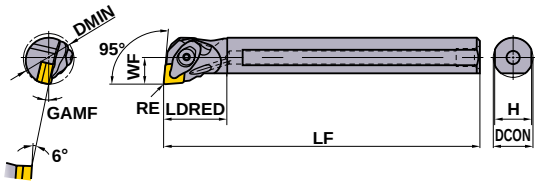
DOUBLE CLAMP DIMPLE BAR

- Negative rake.
- New double clamp type.
- Holds inserts securely.
- Excellent cutting edge repeatability.

S-DCLN

Steel shank coolant through — **CN○○inserts**





Right hand tool holder shown.

Finish	Light	Light	Medium
FH	SA	LP	MA
(4)	(4)	(4)	(4)
Medium	**Medium**	**Stainless**	**CBN**
MH	Standard	MM	
(4)	(4)	(4)	(4)

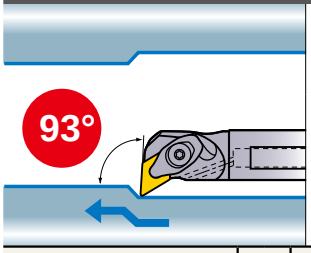
Order Number	Stock R	Stock L	Insert Number		DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
S-DCLNR/L-123-C	●	●	CNMA	32○	.750	10.000	1.219	.500	.711	12°	1.000	.031	LLSCP32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
S-DCLNR/L**-163-C**	●	●	CNMG	32○	1.000	12.000	1.625	.641	.922	11°	1.281	.031	LLSCP32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
S-DCLNR/L**-164-C**	●	●	CNMA	43○	1.000	12.000	1.625	.641	.922	11°	1.281	.031	LLSCP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DCLNR/L**-204-C**	●	●	CNMG	43○	1.250	14.000	2.000	.766	1.171	13°	1.532	.031	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DCLNR/L**-244-C**	●	●	CNMM CNGG	43○	1.500	14.000	2.000	.891	1.382	12°	1.782	.031	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DCLNR/L**-284-C**	●	●	NP-CNMA	43○	1.750	14.000	2.500	1.016	1.632	10°	2.032	.031	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DCLNR/L**-324-C**	●	●	NP-CNGA	43○	2.000	14.000	2.500	1.281	1.882	10°	2.562	.031	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

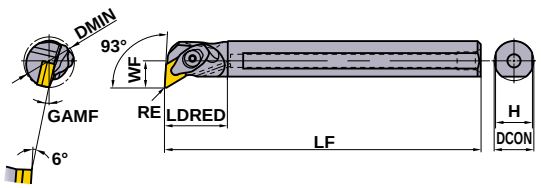
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

S-DDUN

Steel shank coolant through — **DN○○inserts**





Right hand tool holder shown.

Finish	Light	Light	Medium
FH	LP	MP	MA
(4)	(4)	(4)	(4)
Medium	**Medium**	**Stainless**	**CBN**
MH	Standard	MM	
(4)	(4)	(4)	(4)

Order Number	Stock R	Stock L	Insert Number		DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
S-DDUNR/L-164-C	●	●	DNMA	43○	1.000	12.000	1.625	.657	.922	13°	1.314	.031	LLSDP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DDUNR/L**-204-C**	●	●	DNMG	43○	1.250	14.000	2.000	1.000	1.171	11°	2.000	.031	LLSDN43	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DDUNR/L**-244-C**	●	●	DNMX DNGA	43○	1.500	14.000	2.000	1.125	1.382	10°	2.250	.031	LLSDN43	LLP24	DCK2613	DCS1	DC0621T	TKY20F
S-DDUNR/L**-284-C**	●	●	DNGG	43○	1.750	14.000	2.500	1.250	1.632	9°	2.500	.031	LLSDN43	LLP24	DCK2613	DCS1	DC0621T	TKY20F
S-DDUNR/L**-324-C**	●	●	NP-DNMA NP-DNGA	43○	2.000	14.000	2.500	1.375	1.882	8°	2.750	.031	LLSDN43	LLP24	DCK2613	DCS1	DC0621T	TKY20F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : DC0621T=44

RECOMMENDED CUTTING CONDITIONS

Work Material		Hardness	Cutting Mode	l/d≤3 Cutting Speed (SFM)	l/d≤3 Feed (IPR)	l/d≤3 Depth of Cut (inch)	3<l/d≤4 Cutting Speed (SFM)	3<l/d≤4 Feed (IPR)	3<l/d≤4 Depth of Cut (inch)
P	Carbon Steel, Alloy Steel	180–280HB	Medium Cutting	360 (260–460)	.010 (.004–.016)	–.197	360 (260–460)	.008 (.004–.012)	–.157
M	Stainless Steel	≤200HB	Medium Cutting	260 (195–330)	.008 (.004–.012)	–.157	230 (165–330)	.006 (.004–.015)	–.118
K	Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	260 (195–330)	.010 (.004–.016)	–.197	260 (195–330)	.008 (.004–.012)	–.157

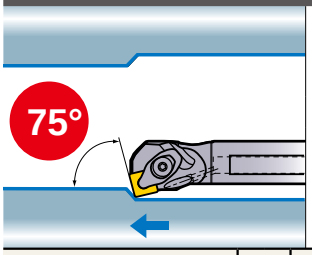
CN○○ type inserts ➤ A096–A102
DN○○ type inserts ➤ A103–A109
CBN & PCD inserts ➤ B022–B026, B051
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

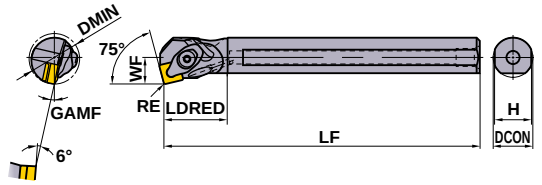
DOUBLE CLAMP DIMPLE BAR

- Negative rake.
- New double clamp type.
- Holds inserts securely.
- Excellent cutting edge repeatability.

S-DSKN

Steel shank coolant through — **SN○○ inserts**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	SA	MA	MH
			
(4)	(4)	(4)	(4)
Medium	**Stainless**	**G Class**	**CBN**
Standard	MM	R/L	
			
(4)	(4)	(4)	(4)

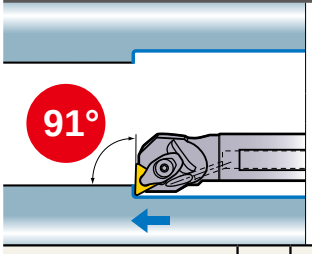
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
S-DSKNR/L-164-C	●	●	SNMA SNMG SNMM SNGA SNGG NP-SNMA NP-SNGA	43○	1.000	12.000	1.625	.641	.922	13°	1.282	.031	LLSSP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DSKNR/L-204-C	●	●		43○	1.250	14.000	2.000	.766	1.171	13°	1.532	.031	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DSKNR/L-244-C	●	●		43○	1.500	14.000	2.000	.891	1.382	11°	1.782	.031	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DSKNR/L-284-C	●	●		43○	1.750	14.000	2.500	1.016	1.632	10°	2.032	.031	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DSKNR/L-324-C	●	●		43○	2.000	14.000	2.500	1.281	1.882	9°	2.562	.031	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

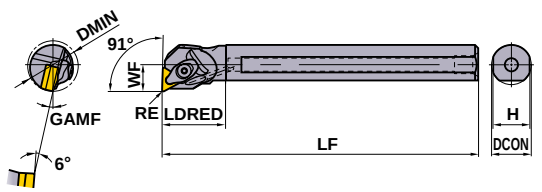
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : DC0621T=44

S-DTFN

Steel shank coolant through — **TN○○ inserts**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	SA	MA	MH
			
(3)	(3,4)	(3,4)	(3,4)
Medium	**Stainless**	**G Class**	**CBN**
Standard	MM	R/L	
			
(3,4)	(3,4)	(3)	(3)

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
S-DTFNR/L-123-C	●	●	TNMA TNMG TNMM TNGA TNGG NP-TNMA NP-TNGA	33○	.750	10.000	1.250	.500	.711	13°	1.000	.031	—	—	DCK2211	DCS2	DC0520T	TKY15F
S-DTFNR/L-163-C	●	●		33○	1.000	12.000	1.625	.641	.922	13°	1.282	.031	LLSTP32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
S-DTFNR/L-203-C	●	●		33○	1.250	14.000	2.000	.766	1.171	13°	1.532	.031	LLSTN32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
S-DTFNR/L-243-C	●	●		33○	1.500	14.000	2.000	.891	1.382	12°	1.782	.031	LLSTN32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
S-DTFNR/L-244-C	●	●		43○	1.500	14.000	2.000	.891	1.382	12°	1.782	.031	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DTFNR/L-283-C	●	●		33○	1.750	14.000	2.500	1.016	1.632	11°	2.032	.031	LLSTN32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
S-DTFNR/L-284-C	●	●		43○	1.750	14.000	2.500	1.016	1.632	11°	2.032	.031	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DTFNR/L-324-C	●	●		43○	2.000	14.000	2.500	1.125	1.882	10°	2.250	.031	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

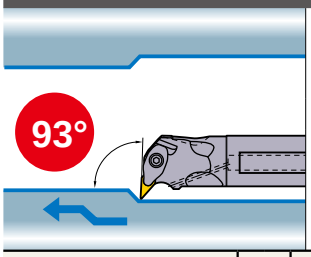
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

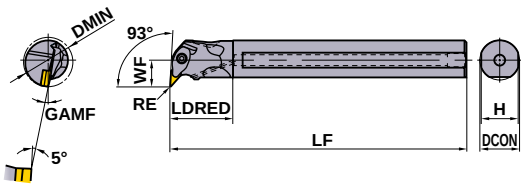
SN○○ type inserts	**➤ A111–A116**
TN○○ type inserts	**➤ A117–A123**
CBN & PCD inserts	**➤ B027–B029, B052**

● : **Inventory maintained.**

S-DVUN

Steel shank coolant through — **VN○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Medium
FH	FJ	LP	MA
			
(3)	(3)	(3)	(3)
Medium	**Stainless**	**CBN**	
MH	MM		
			
(3)	(3)	(3)	

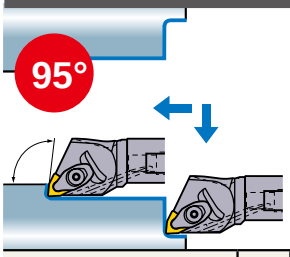
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
S-DVUNR/L-203-C	●	●	VNMA VNMG VNGA VNGM NP-VNMA NP-VNGA	33○	1.250	14.000	2.000	1.000	1.171	10°	2.000	.031	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
S-DVUNR/L-243-C	●	●		33○	1.500	14.000	2.500	1.125	1.382	9°	2.250	.031	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F

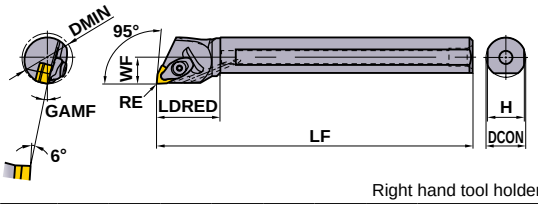
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : DC0520T=31

S-DWLN

Steel shank coolant through — **WN○○inserts**





Right hand tool holder shown.

Finish	Light	Medium
FH	SA	MA
		
(4)	(4)	(3,4)
Stainless	**CBN**	
MM		
		
(3,4)	(4)	

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
S-DWLNR/L-123-C	●	●	WNMG	33○	.750	10.000	1.250	.500	.711	12°	1.000	.031	—	—	DCK2211	DCS2	DC0520T	TKY15F
S-DWLNR/L-163-C	●	●		33○	1.000	12.000	1.750	.641	.922	13°	1.282	.031	LLSWP32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
S-DWLNR/L-164-C	●	●	WNMA WNMG NP-WNMA NP-WNGA	43○	1.000	12.000	2.000	.641	.922	13°	1.282	.031	LLSWP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DWLNR/L-204-C	●	●		43○	1.250	14.000	2.000	.766	1.171	13°	1.532	.031	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DWLNR/L-244-C	●	●		43○	1.500	14.000	2.500	.891	1.382	12°	1.782	.031	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DWLNR/L-284-C	●	●		43○	1.750	14.000	2.500	1.125	1.632	11°	2.250	.031	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DWLNR/L-324-C	●	●		43○	2.000	14.000	2.500	1.281	1.882	10°	2.562	.031	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

* Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Cutting Mode	l/d≤3 Cutting Speed (SFM)	l/d≤3 Feed (IPR)	l/d≤3 Depth of Cut (inch)	3<l/d≤4 Cutting Speed (SFM)	3<l/d≤4 Feed (IPR)	3<l/d≤4 Depth of Cut (inch)
P	Carbon Steel, Alloy Steel	180—280HB	Medium Cutting	360 (260—460)	.010 (.004—.016)	—.197	360 (260—460)	.008 (.004—.012)	—.157
M	Stainless Steel	≤200HB	Medium Cutting	260 (195—330)	.008 (.004—.012)	—.157	230 (165—330)	.006 (.004—.015)	—.118
K	Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	260 (195—330)	.010 (.004—.016)	—.197	260 (195—330)	.008 (.004—.012)	—.157

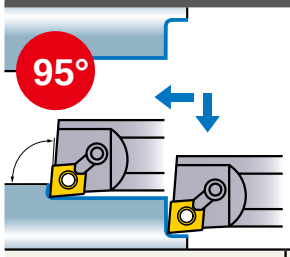
VN○○ type inserts ➤ A124—A127
WN○○ type inserts ➤ A128—A132
CBN & PCD inserts ➤ B030—B032, B053
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

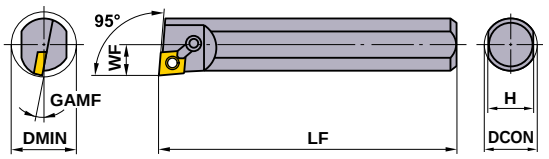
MULTIPLE CLAMP TYPE

- Negative rake.
- Two wall pocket.
- Pin lock and top clamp retention.

S-MCLN

Steel shank — **CN○○inserts**





Right hand tool holder shown.

Finish	Light	Light	Medium
FH	SA	LP	MA
			
(4)	(4)	(4)	(4)
Medium	**Medium**	**Stainless**	**Rough**
MH	Standard	MM	RP
			
(4)	(3,4)	(4)	(6)

Order Number	Stock R	Stock L	Insert Number		DCON	LF	WF	H	GAMF	DMIN	Shim	Shim Pin	Clamp Bridge	Clamp Screw
S-MCLNR/L-123	●	●	CNMA CNMG CNMM CNGG NP-CNMA NP-CNGA	32○	.750	10.000	.500	.700	14°	**1.000**	–	NL33	CL7	XNS36
S-MCLNR/L**-163**	●	●		32○	1.000	12.000	.640	.910	14°	**1.280**	–	NL33	CL7	XNS36
S-MCLNR/L**-164**	●	●		43○ ★2	1.000	12.000	.640	.910	14°	**1.280**	–	NL44	CL20	XNS47
S-MCLNR/L**-204**	●	●		43○ ★2	1.250	12.000	.765	1.160	14°	**1.530**	ICSN433 ★1	NL46	CL20	XNS47
S-MCLNR/L**-244**	●	●		43○ ★2	1.500	14.000	.890	1.410	14°	**1.780**	ICSN433 ★1	NL46	CL20	XNS47
S-MCLNR/L**-284**	●	●		43○ ★2	1.750	14.000	1.015	1.660	12°	**2.030**	ICSN433 ★1	NL46	CL20	XNS47
S-MCLNR/L**-326**	●	●		64○	2.000	14.000	1.281	1.910	12°	**2.562**	ICSN633	NL68	CL12	XNS510

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

★1 (Opt.) See page M009 for different radius.

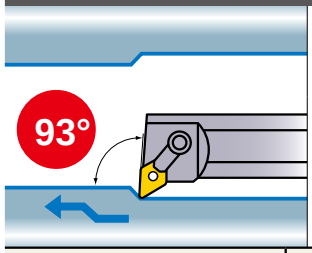
★3 Clamp Torque (lbf-in) : NL33=13, NL44=19, NL46=19, NL68=43, XNS36=30, XNS47=45, XNS510=70

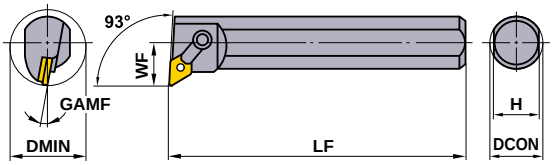
★2 For inserts without hole, remove shim pin and add below.

Shim Screw	S46	Chipbreaker	CBC4

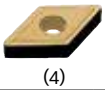
S-MDUN

Steel shank — **DN○○inserts**





Right hand tool holder shown.

Finish	Light	Light	Medium
FH	LP	MP	MA
			
(4)	(4)	(4)	(4)
Medium	**Medium**	**Stainless**	**CBN**
MH	Standard	MM	
			
(4)	(4)	(4)	(4)

Order Number	Stock R	Stock L	Insert Number		DCON	LF	WF	H	GAMF	DMIN	Shim	Shim Pin	Clamp Bridge	Clamp Screw
S-MDUNR/L-204	●	●	DNMA DNMG DNMM DNGM DNGA DNGG NP-DNMA NP-DNGA	43○	1.250	12.000	1.000	1.160	10°	**2.000**	IDSN433	NL46	CL12	XNS59
S-MDUNR/L**-244**	●	●		43○	1.500	14.000	1.125	1.410	10°	**2.250**	IDSN433	NL46	CL12	XNS59
S-MDUNR/L**-284**	●	●		43○	1.750	14.000	1.250	1.660	10°	**2.500**	IDSN433	NL46	CL12	XNS59
S-MDUNR/L**-285**	□			54○ ★1	1.750	14.000	1.375	1.660	10°	**2.750**	IDSN533 ★1	NL58	CL30	XNS510
S-MDUNR/L**-324**	●	●		43○	2.000	14.000	1.375	1.910	10°	**2.750**	IDSN433	NL46	CL12	XNS59
S-MDUNR/L**-325**	□			54○ ★1	2.000	14.000	1.500	1.910	10°	**3.000**	IDSN533 ★1	NL58	CL30	XNS510

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

★1 (Opt.) See page M009 for different thickness.

★2 Clamp Torque (lbf-in) : NL46=19, NL58=29, XNS59=70, XNS510=70

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

● : **Inventory maintained.**

□ : **Non stock, produced to order only.**

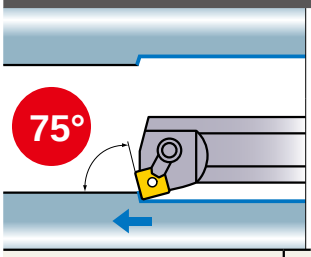
CN○○ type inserts ➤ **A096–A102**

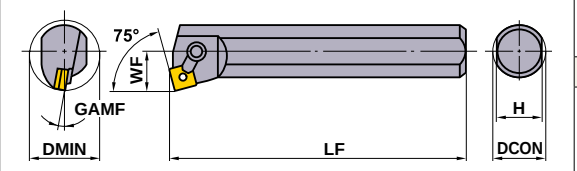
DN○○ type inserts ➤ **A103–A109**

CBN & PCD inserts ➤ **B022–B026, B051**

S-MSKN

Steel shank — **SN○○ inserts**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MA
			
(4)	(4)	(4)	(4,6)
Medium	**Medium**	**Stainless**	**Rough**
MH	Standard	MM	RP
			
(4,6)	(4,6)	(4,6)	(6)

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	Shim	Shim Pin ★3	Clamp Bridge	Clamp Screw ★3
S-MSKNR/L-204	●	●	SNMA SNMG SNMM SNGA SNGG NP-SNMA NP-SNGA	43○ ★1 ★2	1.250	12.000	.765	1.160	14°	**1.530**	ISSN433 ★1	NL46	CL9	XNS59
S-MSKNR/L**-244**	●	●		43○ ★1 ★2	1.500	14.000	.890	1.410	14°	**1.780**	ISSN433 ★1	NL46	CL9	XNS59
S-MSKNR/L**-284**	●	●		43○ ★1 ★2	1.750	14.000	1.015	1.660	12°	**2.030**	ISSN433 ★1	NL46	CL9	XNS59
S-MSKNR/L**-326**	●	●		64○ ★1	2.000	14.000	1.281	1.910	12°	**2.562**	ISSN633 ★1	NL68	CL12	XNS58

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

★1 (Opt.) See page M010 for different thickness or radius.

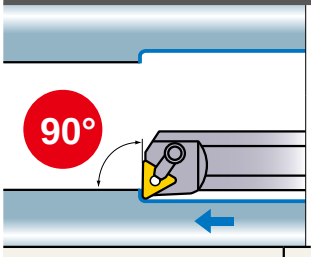
★2 For inserts without hole, remove shim pin and add below.

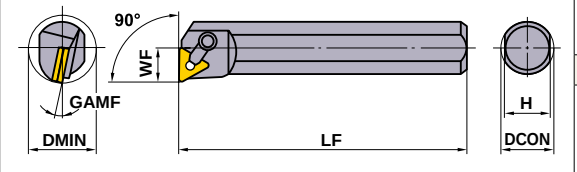
Shim Screw	S34	Chipbreaker	CBS4

★3 Clamp Torque (lbf-in) : NL46=19, NL68=43, XNS58=70, XNS59=70

S-MTFN

Steel shank — **TN○○ inserts**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MA
			
(3)	(3,4)	(3,4)	(3,4)
Medium	**Medium**	**Stainless**	**CBN**
MH	Standard	MM	
			
(3,4)	(3,4)	(3,4)	(3)

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	Shim	Shim Pin ★3	Clamp Bridge	Clamp Screw ★3
S-MTFNR/L-163X	●	●	TNMA TNMG TNMM TNGA TNGG NP-TNMA NP-TNGA	33○ ★1 ★2	1.000	12.000	.640	.910	15°	**1.280**	ITSN323 ★1	NL34L	CL7	XNS35
S-MTFNR/L**-203X**	●	●		33○ ★1 ★2	1.250	12.000	.765	1.160	12°	**1.530**	ITSN323 ★1	NL34L	CL7	XNS35
S-MTFNR/L**-243X**	●	●		33○ ★1 ★2	1.500	14.000	.890	1.410	10°	**1.780**	ITSN323 ★1	NL34L	CL7	XNS35
S-MTFNR/L**-244**	●	●		43○ ★1	1.500	14.000	1.031	1.410	10°	**2.062**	ITSN432 ★1	NL46	CL9	XNS59
S-MTFNR/L**-283X**	□			33○ ★1 ★2	1.750	14.000	1.015	1.660	10°	**2.030**	ITSN323 ★1	NL34L	CL7	XNS35
S-MTFNR/L**-284**	●	●		43○ ★1	1.750	14.000	1.156	1.660	8°	**2.312**	ITSN432 ★1	NL46	CL9	XNS59
S-MTFNR/L**-324**	●	●		43○ ★1	2.000	14.000	1.281	1.910	8°	**2.562**	ITSN432 ★1	NL46	CL9	XNS59

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

★1 (Opt.) See page M010 for different thickness or radius.

★2 For inserts without hole, remove shim pin and add below.

Shim Screw	S34	Chipbreaker	CBT3

★3 Clamp Torque (lbf-in) : NL34L=13, NL46=19, XNS35=30, XNS59=70

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Cutting Mode	l/d≤3 Cutting Speed (SFM)	l/d≤3 Feed (IPR)	l/d≤3 Depth of Cut (inch)	3<l/d≤4 Cutting Speed (SFM)	3<l/d≤4 Feed (IPR)	3<l/d≤4 Depth of Cut (inch)
P	Carbon Steel, Alloy Steel	180–280HB	Medium Cutting	260–460	.004–.016	–.20	260–460	.004–.012	–.16
M	Stainless Steel	≤200HB	Medium Cutting	200–330	.008–.012	–.16	165–330	.004–.015	–.12
K	Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	200–330	.004–.016	–.20	200–330	.004–.012	–.16

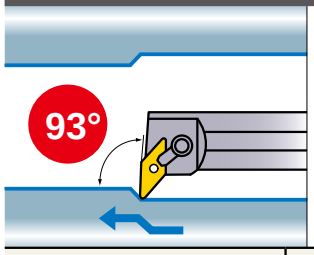
SN○○ type inserts ➤ A111–A116
TN○○ type inserts ➤ A117–A123
CBN & PCD inserts ➤ B027–B029, B052
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

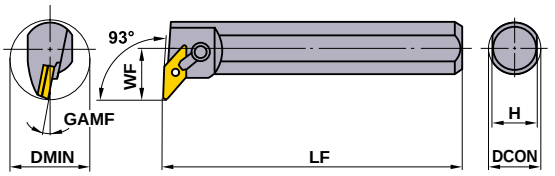
MULTIPLE CLAMP TYPE

- Negative rake.
- Two wall pocket.
- Pin lock and top clamp retension.

S-MVUN

Steel shank — VN○○inserts





Right hand tool holder shown.

Finish	Light	Light	Medium
FH	LP	MP	MA
			
(3)	(3)	(3)	(3)
Medium	**Medium**	**Stainless**	**CBN**
MH	GM	MM	
			
(3)	(3)	(3)	(3)

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	Shim	Shim Pin ★2	Clamp Bridge	Clamp Screw ★2
S-MVUNR/L-203	●	□	VNMG VNGA VNGG VNGM NP-VNMA NP-VNGA	33○	1.250	14.000	1.125	1.16	12°	**2.250**	IVSN322	NL34L	CL12	XNS58
S-MVUNR/L-243	●	□		33○	1.500	14.000	1.250	1.41	12°	**2.500**	IVSN322	NL34L	CL12	XNS58
S-MVUNR/L-284	●			43○ ★1	1.750	14.000	1.500	1.66	12°	**3.000**	IVSN432 ★1	NL46	CL12	XNS59
S-MVUNR/L-324	□			43○ ★1	2.000	16.000	1.625	1.91	12°	**3.250**	IVSN432 ★1	NL46	CL12	XNS59

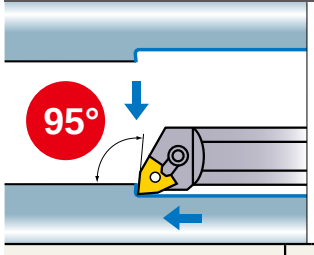
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

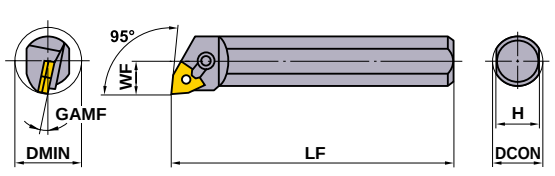
★1 (Opt.) See page M010 for different radius.

★2 Clamp Torque (lbf-in) : NL34L=13, NL46=19, XNS58=70, XNS59=70

S-MWLN

Steel shank — WN○○inserts





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MA
			
(4)	(3,4)	(3,4)	(3,4)
Medium	**Medium**	**Stainless**	
MH	GM	MM	
			
(3,4)	(3,4)	(3,4)	

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	Shim	Shim Pin ★	Clamp Bridge	Clamp Screw ★
S-MWLNR/L-123	●	●	WNMA WNMG NP-WNMA	32○	.750	10.000	.500	.700	14°	**1.000**	–	NL33	CL7	XNS36
S-MWLNR/L-163	●	●		32○	1.000	12.000	.640	.910	14°	**1.280**	–	NL33	CL7	XNS36
S-MWLNR/L-164	●	●		43○	1.000	12.000	.640	.910	14°	**1.280**	–	NL44	CL20	XNS47
S-MWLNR/L-204	●	●		43○	1.250	12.000	.765	1.160	14°	**1.530**	IWSN432	NL46	CL20	XNS48
S-MWLNR/L-244	●	●		43○	1.500	14.000	.890	1.410	14°	**1.780**	IWSN432	NL46	CL20	XNS48

★ Clamp Torque (lbf-in) : NL33=13, NL44=19, NL46=19, XNS36=30, XNS47=45, XNS48=45

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

● : **Inventory maintained.**

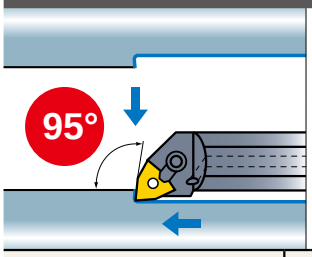
□ : **Non stock, produced to order only.**

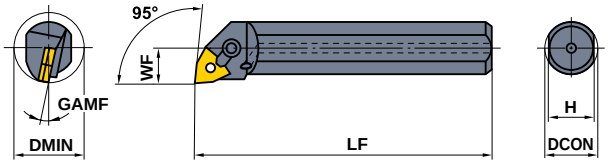
VN○○ type inserts	**➤ A124–A127**
WN○○ type inserts	**➤ A128–A132**
CBN & PCD inserts	**➤ B030–B032, B053**

M-MWLN

Heavy metal shank coolant thru

WN○○inserts





Right hand tool holder shown.

Finish	Light
FH	SA
	
(4)	(4)
Stainless	**Stainless**
MA	MM
	
(4)	(4)

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin *	Clamp Bridge	Clamp Screw *
	R	L			DCON	LF	WF	H	GAMF	DMIN				
M-MWLNR/L-164-C	●	●	WNMA WNMG NP-WNMA	43○	1.000	12.000	.640	.955	14°	**1.280**	–	NL44	CL20	XNS47
M-MWLNR/L-204-C	●	●		43○	1.250	12.000	.765	1.205	14°	**1.530**	IWSN432	NL46	CL20	XNS48
M-MWLNR/L-244-C	●	●		43○	1.500	14.000	.890	1.455	14°	**1.780**	IWSN432	NL46	CL20	XNS48

* Clamp Torque (lbf-in) : NL44=19, NL46=19, XNS47=45, XNS48=45

BORING BARS

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Cutting Mode	l/d≤3			3<l/d≤4		
				Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P	Carbon Steel, Alloy Steel	180–280HB	Medium Cutting	260–460	.004–.016	–.20	260–460	.004–.012	–.16
M	Stainless Steel	≤200HB	Medium Cutting	200–330	.008–.012	–.16	165–330	.004–.010	–.12
K	Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	200–330	.004–.016	–.20	200–330	.004–.012	–.16

WN○○ type inserts ➤ A128–A132
CBN inserts ➤ B032
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

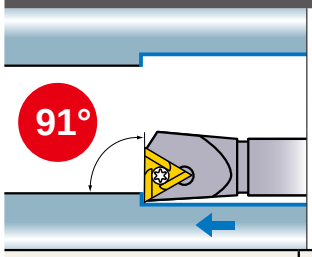
AL TYPE BORING BARS

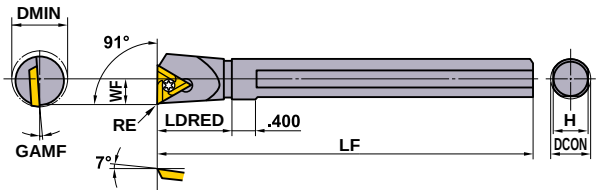
- Shank sizes ϕ.625inch thru ϕ1.000inch.
- Screw-on type.
- Recommended for aluminum, nonferrous metals and plastics.

S-STFE

Steel shank

TE○○inserts





Right hand tool holder shown.

Medium
R/L



(3)

PCD
R/L



(3)

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
S-STFER/L-103	●	●	TEGX	32○	.625	8.000	1.250	.406	.560	3°	**.813**	.016	FC400890T	TKY10F
S-STFER/L**-123**	●	●		32○	.750	10.000	1.500	.500	.700	3°	**1.000**	.016	FC400890T	TKY10F
S-STFER/L**-163**	●	●		32○	1.000	12.000	1.625	.641	.910	3°	**1.281**	.016	FC400890T	TKY10F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : FC400890T=22

RECOMMENDED CUTTING CONDITIONS

	Work Material	Grade	Cutting Speed (SFM)	l/d=3 Feed (IPR)	l/d=3 D.O.C (inch)	l/d=4 Feed (IPR)	l/d=4 D.O.C (inch)	l/d=5 Feed (IPR)	l/d=5 D.O.C (inch)	l/d=6 Feed (IPR)	l/d=6 D.O.C (inch)
N	Aluminum Alloy	**HTi10**	655－1970	.002－.010	－.12	.002－.010	－.12	.002－.008	－.10	.002－.008	－.039

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

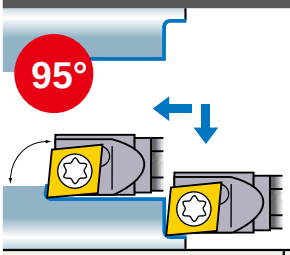
TE○○ type inserts ➤ A158
PCD inserts ➤ B062

● : **Inventory maintained.**

MICRO-DEX

- The minimum cutting diameter is ϕ5mm (.197inch).
- 7°positive insert.
- Carbide shank type.
- Easy-to-use tool geometries.
- Suitable for small workpiece.
- l/d is 5 times the diameter.

SCLC — Carbide shank — CC○○inserts





Right hand tool holder only.

Finish: L F



(03,04)

CBN



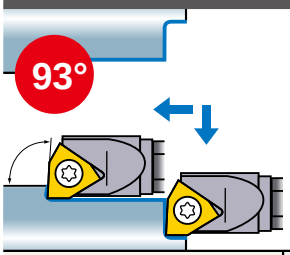
(03,04)

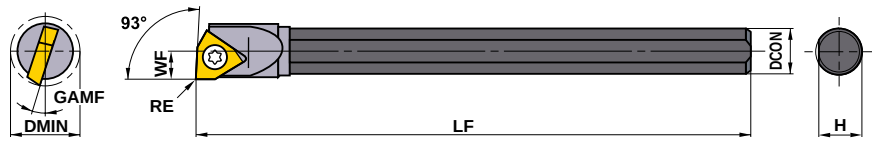
Order Number	Stock R	Insert Number		Dimensions (mm) DCON	LF	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
C04GSCLCR03	●	CCGT NP-CCGW	1.21○○	4	90	2.5	3.7	15°	**5**	0.2	TS16	TKY06F
C05HSCLCR03	●		1.21○○	5	100	3.0	4.7	13°	**6**	0.2	TS16	TKY06F
C06JSCLCR04	●		1.51○○	6	110	3.5	5.7	13°	**7**	0.2	TS21	TKY06F
C07KSCLCR04	●		1.51○○	7	125	4.0	6.7	11°	**8**	0.2	TS21	TKY06F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS16=5.3, TS21=5.3

SWUB — Carbide shank — WBGT inserts





Right hand tool holder only.

Finish: L F



(1.2,1.5)

Order Number	Stock R	Insert Number		Dimensions (mm) DCON	LF	WF	H	GAMF	DMIN	RE	* Clamp Screw	Wrench
C05HSWUBR02	●	WBGT	1.21○○LF	5	100	3.0	4.7	15°	**6**	0.2	TS21	TKY06F
C06JSWUBR02	●		1.21○○LF	6	110	3.5	5.7	13°	**7**	0.2	TS2C	TKY06F
C07KSWUBRL3	●		1.51.5○○LF	7	125	4.0	6.7	15°	**8**	0.2	TS2	TKY06F

(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS21=5.3, TS2C=5.3, TS2=5.3

RECOMMENDED CUTTING CONDITIONS

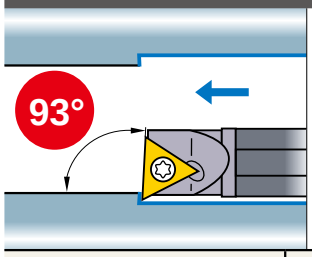
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	l/d
P	General Steel	**NX2525**	130—395	.0004—.002	.004—.012	3—5
M	Stainless Steel	**VP15TF**	130—395	.0004—.002	.004—.012	3—5
K	Cast Iron	**VP15TF**	130—395	.0004—.002	.004—.012	3—5
N	Non-Ferrous Material	**VP15TF**	260—525	.0004—.002	.004—.024	3—5
		MD220	260—525	.0004—.002	.004—.024	3—5

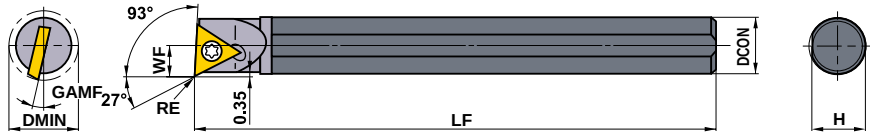
CCGT type inserts ➤ A137
WBGT type inserts ➤ A170
CBN inserts ➤ B037
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

MICRO-DEX

- The minimum cutting diameter is ϕ8mm (.315inch).
- 7°positive insert.
- Carbide shank type.
- Easy-to-use tool geometries.
- Suitable for small workpiece.
- l/d is 5 times the diameter.

STUC — Carbide shank — TCGT inserts





Right hand tool holder only.

Finish: L F



(1.2)

Order Number	Stock	Insert Number		Dimensions (mm)							* Clamp Screw	Wrench
	R			DCON	LF	WF	H	GAMF	DMIN	RE		
C07KSTUCR06	●	TCGT	1.21○○LF	7	125	4.0	6.7	12°	**8**	0.2	TS2C	TKY06F

* Clamp Torque (lbf-in) : TS2C=5.3

RECOMMENDED CUTTING CONDITIONS

	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	l/d
P	General Steel	**NX2525**	130—395	.0004—.002	.004—.012	3—5
M	Stainless Steel	**VP15TF**	130—395	.0004—.002	.004—.012	3—5
K	Cast Iron	**VP15TF**	130—395	.0004—.002	.004—.012	3—5
N	Non-Ferrous Material	**VP15TF**	260—525	.0004—.002	.004—.024	3—5
		MD220	260—525	.0004—.002	.004—.024	3—5

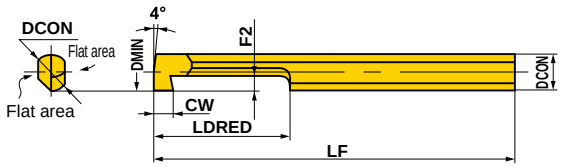
● : Inventory maintained. (1 MICRO-MINI in one case)

TCGT type inserts ➤ A156

MICRO-MINI

- Solid carbide type (Single cutting edges).
- l/d is 5 times the diameter.
- Cutting edge can be shaped according to the application.
  Thus, it covers a wide cutting range (threading, grooving, copying, etc.).

STANDARD MICRO-MINI BORING BARS (Solid carbide boring bar)

Geometry	Order Number	Stock TF15	Dimensions (mm) CW	DCON	LF	LDRED	DMIN	F2
 Right hand tool only.	**C03FR-BLS**	●	2.0	3	80	15	**3.2**	1.0
	C04FR-BLS	●	2.5	4	80	20	**4.2**	1.5
	C05HR-BLS	●	3.0	5	100	25	**5.2**	2.0

∗ DMIN : Min. Cutting Diameter

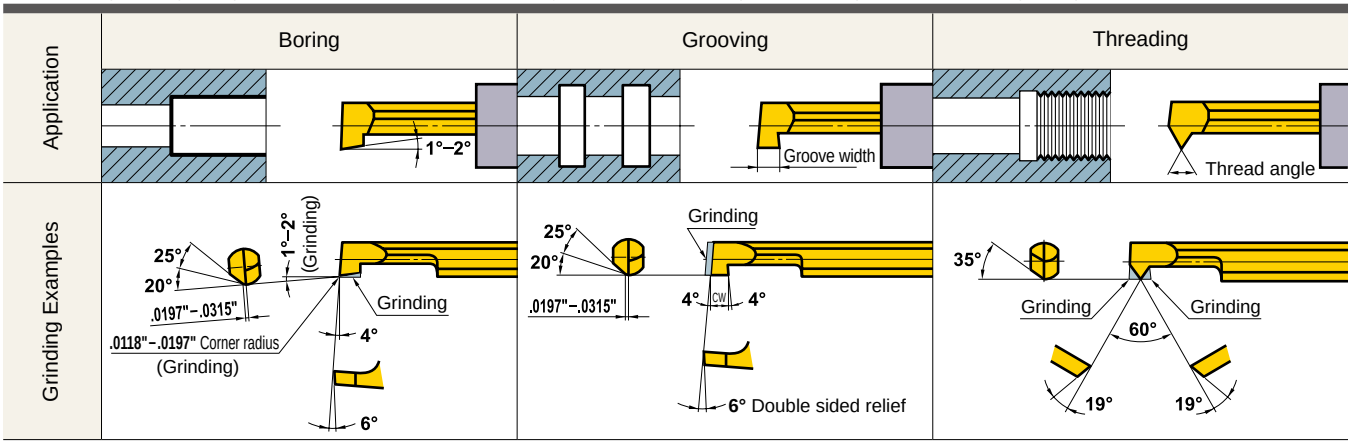
RECOMMENDED CUTTING CONDITIONS

	Work Material	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	l/d	Cutting Edge Preparation ∗ Corner Radius or C	∗ Honing
P	General Steel	100—165	—.004	.004—.012	5	.004—.020	.0004—.002
M	Stainless Steel	100—165	—.004	.004—.012	5	≤.016	≤.001 (Honing not required)
K	Cast Iron	100—165	—.002	.004—.012	5	.004—.020	.0004—.002
N	Non-Ferrous Material	200—330	—.004	.004—.020	5	.004—.020	≤.001 (Honing not required)

∗ Cutting edge is not honed. Please hone according to the workpiece before machining.

GRINDING THE CUTTING EDGE OF MICRO-MINI BORING BAR

●MICRO-MINI boring bar can be applied to boring and grooving without any modifications. It can also be reground as shown below.
●For shaping and regrinding, use diamond wet stone approximately #250 - #400. Please grind according to application using the figure below as a reference.



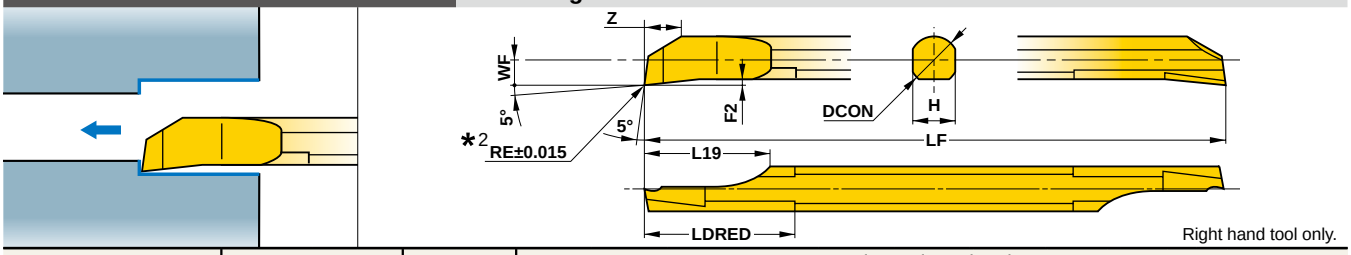
BORING BARS

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

MICRO-MINI TWIN

CB

For boring



Right hand tool only.

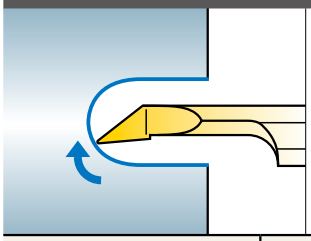
Order Number	Stock		Breaker	Dimensions (mm)									
	Micro Grain Carbide	Coated		DMIN *1		RE	DCON	LF	L19	LDRED	WF	F2	H	Z
	TF15	VP15TF		l/d≤3	l/d>3									
CB02RS	●	●	Without	**2.2**	**3.6**	0.05	2	50	5	6	1	0.25	1.8	1.4
CB02RS-B	●	●	With	**2.2**	**3.9**	0.05	2	50	5	6	1	0.25	1.8	1.4
CB02RS-01	●	●	Without	**2.2**	**3.6**	0.1	2	50	5	6	1	0.25	1.8	1.4
CB02RS-01B	●	●	With	**2.2**	**4.2**	0.1	2	50	5	6	1	0.25	1.8	1.4
CB02RS-02	●	●	Without	**2.2**	**3.6**	0.2	2	50	5	6	1	0.25	1.8	1.4
CB02RS-02B	●	●	With	**2.2**	**4.9**	0.2	2	50	5	6	1	0.25	1.8	1.4
CB03RS	●	●	Without	**3.2**	**4.2**	0.05	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-B	●	●	With	**3.2**	**4.4**	0.05	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-01	●	●	Without	**3.2**	**4.2**	0.1	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-01B	●	●	With	**3.2**	**4.5**	0.1	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-02	●	●	Without	**3.2**	**4.2**	0.2	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-02B	●	●	With	**3.2**	**4.8**	0.2	3	50	7.5	9	1.5	0.35	2.7	2.3
CB04RS	●	●	Without	**4.2**	**5.1**	0.05	4	60	10	12	2	0.45	3.6	3.1
CB04RS-B	●	●	With	**4.2**	**5.2**	0.05	4	60	10	12	2	0.45	3.6	3.1
CB04RS-01	●	●	Without	**4.2**	**5.1**	0.1	4	60	10	12	2	0.45	3.6	3.1
CB04RS-01B	●	●	With	**4.2**	**5.3**	0.1	4	60	10	12	2	0.45	3.6	3.1
CB04RS-02	●	●	Without	**4.2**	**5.1**	0.2	4	60	10	12	2	0.45	3.6	3.1
CB04RS-02B	●	●	With	**4.2**	**5.5**	0.2	4	60	10	12	2	0.45	3.6	3.1
CB05RS	●	●	Without	**5.2**	**6.0**	0.05	5	70	12.5	15	2.5	0.55	4.5	3.9
CB05RS-B	●	●	With	**5.2**	**6.1**	0.05	5	70	12.5	15	2.5	0.55	4.5	3.9
CB05RS-02	●	●	Without	**5.2**	**6.0**	0.2	5	70	12.5	15	2.5	0.55	4.5	3.9
CB05RS-02B	●	●	With	**5.2**	**6.4**	0.2	5	70	12.5	15	2.5	0.55	4.5	3.9
CB06RS	●	●	Without	**6.2**	**7.2**	0.05	6	75	12.5	18	3	0.65	5.4	4.7
CB06RS-B	●	●	With	**6.2**	**7.3**	0.05	6	75	12.5	18	3	0.65	5.4	4.7
CB06RS-02	●	●	Without	**6.2**	**7.2**	0.2	6	75	12.5	18	3	0.65	5.4	4.7
CB06RS-02B	●	●	With	**6.2**	**7.8**	0.2	6	75	12.5	18	3	0.65	5.4	4.7
CB07RS	●	●	Without	**7.2**	**8.6**	0.05	7	85	12.5	21	3.5	0.75	6.3	5.5
CB07RS-B	●	●	With	**7.2**	**8.8**	0.05	7	85	12.5	21	3.5	0.75	6.3	5.5
CB07RS-02	●	●	Without	**7.2**	**8.6**	0.2	7	85	12.5	21	3.5	0.75	6.3	5.5
CB07RS-02B	●	●	With	**7.2**	**9.2**	0.2	7	85	12.5	21	3.5	0.75	6.3	5.5

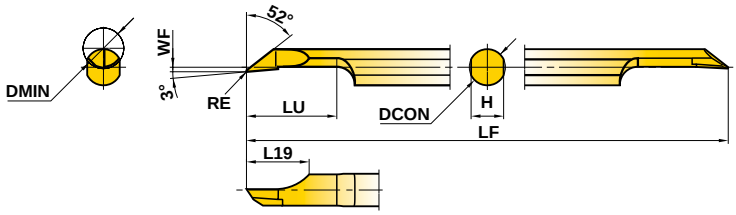
*1 DMIN : Min. Cutting Diameter
*2 The Re dimension represents the size before grinding a chip breaker.

● : Inventory maintained. (1 MICRO-MINI TWIN in one case)

CR

For copying

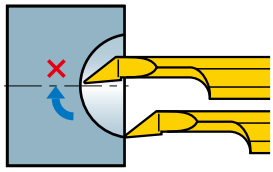
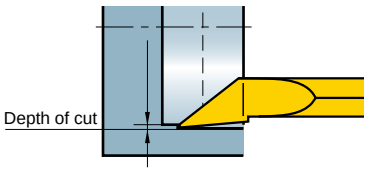




Right hand tool only.

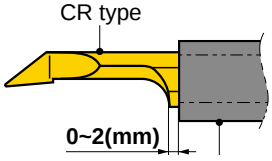
Order Number	Stock		Breaker	Dimensions (mm)							
	Micrograin Carbide	Coated									
	TF15	VP15TF		DMIN	RE	DCON	LF	LU	L19	WF	H
CR03RS-01	●	●	Without	**3.5**	0.1	3	50	8	6	0.15	2.7
CR03RS-01B	●	●	With	**3.5**	0.1	3	50	8	6	0.15	2.7
CR04RS-01	●	●	Without	**4.5**	0.1	4	60	10	7	0.15	3.6
CR04RS-01B	●	●	With	**4.5**	0.1	4	60	10	7	0.15	3.6
CR05RS-01	●	●	Without	**5.5**	0.1	5	70	12	8	0.15	4.5
CR05RS-01B	●	●	With	**5.5**	0.1	5	70	12	8	0.15	4.5

NOTES

Profile turning, Inner end facing	Copying
The cutting edge should not be cross the center line of the workpiece. 	**The depth of cut should be smaller than the corner radius value.** 
If the cutting edge crosses the center line of a workpiece, the cutting edge can fracture.	With depths of cut larger than the corner radius value, burrs will be formed.

RECOMMENDED TOOL OVERHANG

MICRO-MINI TWIN
CR type



RECOMMENDED CUTTING CONDITIONS

	Work Material	CB Type				CR Type		
		Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	Overhang (l/d)	Cutting Speed (SFM)	Feed (IPR) 03RS/04RS	Feed (IPR) 05RS
P	General Steel	130—395	.0004—.002	.004—.012	3—5	130—395	.0004—.001	.0004—.002
M	Stainless Steel	130—395	.0004—.002	.004—.012	3—5	130—395	.0004—.001	.0004—.002
K	Cast Iron	130—395	.0004—.002	.004—.012	3—5	130—395	.0004—.002	.0004—.002
N	Non Ferrous Materials	260—525	.0004—.003	.004—.020	3—5	260—525	.0004—.002	.0004—.003

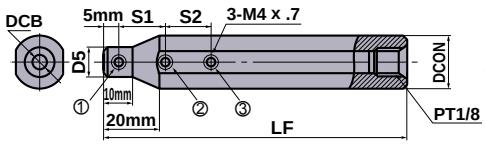
(Note) Recommend wet machining.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

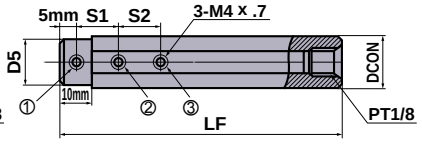
HOLDER (INCH SHANK STANDARD)

RBH

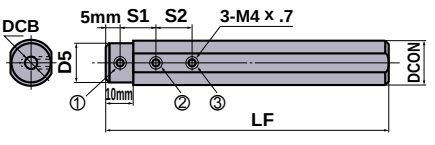
Round type holder



RBH16□□□A
(Coolant thru)



RBH10□□□A, RBH12□□□A
(Coolant thru)



RBH190□□N

ID (DCB) : INCH TYPE

Order Number	Stock	Dimensions						Clamp Screw *			Wrench	Torque (lbf-in)
		DCON (inch)	DCB (inch)	D5 (mm)	LF (mm)	S1 (mm)	S2 (mm)	①	②	③		
RBH10300A	●	.625	.187	15	100	15	15	A	A	A	HKY20F	18 (2.0N·m)
RBH**10350A**	●	.625	.219	15	100	15	15	A	A	A	HKY20F	18 (2.0N·m)
RBH**10400A**	●	.625	.250	15	100	20	20	A	A	A	HKY20F	18 (2.0N·m)
RBH**10500A**	●	.625	.313	15	100	20	20	D	D	D	HKY20F	18 (2.0N·m)
RBH12300A	●	.750	.187	18	125	15	15	B	B	B	HKY20F	18 (2.0N·m)
RBH**12350A**	●	.750	.219	18	125	15	15	B	B	B	HKY20F	18 (2.0N·m)
RBH**12400A**	●	.750	.250	18	125	20	20	B	B	B	HKY20F	18 (2.0N·m)
RBH**12500A**	●	.750	.313	18	125	20	20	A	A	A	HKY20F	18 (2.0N·m)
RBH16300A	●	1.000	.187	14	150	15	15	A	C	C	HKY20F	18 (2.0N·m)
RBH**16350A**	●	1.000	.219	15	150	15	15	A	C	C	HKY20F	18 (2.0N·m)
RBH**16400A**	●	1.000	.250	16	150	20	20	A	C	C	HKY20F	18 (2.0N·m)
RBH**16500A**	●	1.000	.313	17	150	20	20	A	C	C	HKY20F	18 (2.0N·m)

ID (DCB) : METRIC TYPE

Order Number	Stock	Dimensions						Clamp Screw *			Wrench	Torque (lbf-in)
		DCON (inch)	DCB (mm)	D5 (mm)	LF (mm)	S1 (mm)	S2 (mm)	①	②	③		
RBH10126A	●	.625	2	15	100	10	—	B	B	—	HKY20F	18 (2.0N·m)
RBH**10189A**	●	.625	3	15	100	10	10	A	A	A	HKY20F	18 (2.0N·m)
RBH**10252A**	●	.625	4	15	100	15	15	A	A	A	HKY20F	18 (2.0N·m)
RBH**10315A**	●	.625	5	15	100	15	15	A	A	A	HKY20F	18 (2.0N·m)
RBH**10378A**	●	.625	6	15	100	20	20	A	A	A	HKY20F	18 (2.0N·m)
RBH**10441A**	●	.625	7	15	100	20	20	A	A	A	HKY20F	18 (2.0N·m)
RBH19020N	●	.750	2	18	125	10	—	C	C	—	HKY20F	18 (2.0N·m)
RBH**19030N**	●	.750	3	18	125	10	10	B	B	B	HKY20F	18 (2.0N·m)
RBH**19040N**	●	.750	4	18	125	15	15	B	B	B	HKY20F	18 (2.0N·m)
RBH**19050N**	●	.750	5	18	125	15	15	B	B	B	HKY20F	18 (2.0N·m)
RBH**19060N**	●	.750	6	18	125	15	15	B	B	B	HKY20F	18 (2.0N·m)
RBH**19070N**	●	.750	7	18	125	20	20	B	B	B	HKY20F	18 (2.0N·m)
RBH16126A	●	1.000	2	11	150	10	—	A	B	—	HKY20F	18 (2.0N·m)
RBH**16189A**	●	1.000	3	12	150	10	10	A	B	C	HKY20F	18 (2.0N·m)
RBH**16252A**	●	1.000	4	13	150	15	15	A	C	C	HKY20F	18 (2.0N·m)
RBH**16315A**	●	1.000	5	14	150	15	15	A	C	C	HKY20F	18 (2.0N·m)
RBH**16378A**	●	1.000	6	15	150	20	20	A	C	C	HKY20F	18 (2.0N·m)
RBH**16441A**	●	1.000	7	16	150	20	20	A	C	C	HKY20F	18 (2.0N·m)

* Order number of clamp screw A=HSS04004, B=HSS04006, C=HSS04008, D=HSS04003

● : Inventory maintained.

HOLDER CROSS REFERENCE LIST OF INCH SHANK STANDARD

Holder			MICRO-MINI TWIN		MICRO-DEX	MICRO-MINI	Machine Makers
Type	Order Number		CB	CR		C	
Round Type Holder ϕ.625 inch	ID : Metric Type	**RBH10126A**	02RS(-B) 02RS-0□(B)	–	–	–	Citizen Precision Machinery Co., Ltd. NC lathes
		RBH**10189A**	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
		RBH**10252A**	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
		RBH**10315A**	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
		RBH**10378A**	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
		RBH**10441A**	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
	ID : Inch Type	**RBH10300A**	For DIMPLE BAR and SCREW CLAMP TYPE				
		RBH**10350A**					
		RBH**10400A**					
		RBH**10500A**					
Round Type Holder ϕ.750 inch	ID : Metric Type	**RBH19020N**	02RS(-B) 02RS-0□(B)	–	–	–	Citizen Precision Machinery Co., Ltd.
		RBH**19030N**	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
		RBH**19040N**	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
		RBH**19050N**	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
		RBH**19060N**	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
		RBH**19070N**	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
	ID : Inch Type	**RBH12300A**	For DIMPLE BAR and SCREW CLAMP TYPE				
		RBH**12350A**					
		RBH**12400A**					
		RBH**12500A**					
Round Type Holder ϕ1.000 inch	ID : Metric Type	**RBH16126A**	02RS(-B) 02RS-0□(B)	–	–	–	Citizen Precision Machinery Co., Ltd. NC lathes
		RBH**16189A**	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
		RBH**16252A**	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
		RBH**16315A**	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
		RBH**16378A**	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
		RBH**16441A**	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
	ID : Inch Type	**RBH16300A**	For DIMPLE BAR and SCREW CLAMP TYPE				
		RBH**16350A**					
		RBH**16400A**					
		RBH**16500A**					

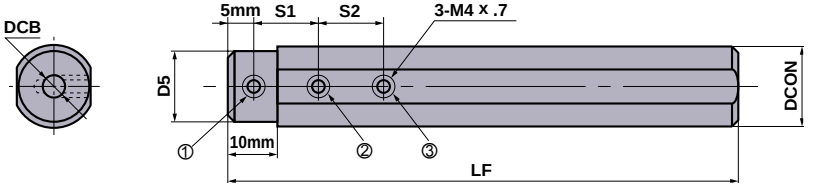
∗ Mitsubishi Materials obtained the makers' approval before entering their names in the list.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

HOLDER (METRIC SHANK STANDARD)

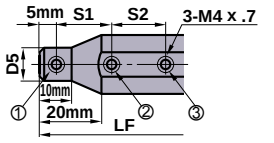
RBH

Round type holder

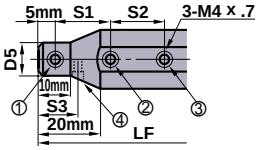


RBH16○○N

RBH20○○N
RBH25○○N



RBH22○○N



Order Number	Stock	Dimensions (mm)							Clamp Screw *				Wrench	Torque (lbf-in)
		DCON	DCB	D5	LF	S1	S2	S3	①	②	③	④		
RBH1620N	●	16	2	15	100	10	—	—	B	B	—	—	HKY20F	18 (2.0N·m)
RBH**1630N**	●	16	3	15	100	10	10	—	A	A	A	—	HKY20F	18 (2.0N·m)
RBH**1640N**	●	16	4	15	100	15	15	—	A	A	A	—	HKY20F	18 (2.0N·m)
RBH**1650N**	●	16	5	15	100	15	15	—	A	A	A	—	HKY20F	18 (2.0N·m)
RBH**1660N**	●	16	6	15	100	15	15	—	A	A	A	—	HKY20F	18 (2.0N·m)
RBH**1670N**	●	16	7	15	100	20	20	—	A	A	A	—	HKY20F	18 (2.0N·m)
RBH2020N	●	20	2	11	125	10	—	—	A	A	—	—	HKY20F	18 (2.0N·m)
RBH**2030N**	●	20	3	12	125	10	10	—	A	A	B	—	HKY20F	18 (2.0N·m)
RBH**2040N**	●	20	4	13	125	15	15	—	A	B	B	—	HKY20F	18 (2.0N·m)
RBH**2050N**	●	20	5	14	125	15	15	—	A	B	B	—	HKY20F	18 (2.0N·m)
RBH**2060N**	●	20	6	15	125	15	15	—	A	B	B	—	HKY20F	18 (2.0N·m)
RBH**2070N**	●	20	7	16	125	20	20	—	A	B	B	—	HKY20F	18 (2.0N·m)
RBH2220N	●	22	2	11	125	10	—	10	A	B	—	A	HKY20F	18 (2.0N·m)
RBH**2230N**	●	22	3	12	125	10	10	10	A	B	C	A	HKY20F	18 (2.0N·m)
RBH**2240N**	●	22	4	13	125	15	15	12.5	A	B	B	A	HKY20F	18 (2.0N·m)
RBH**2250N**	●	22	5	14	125	15	15	12.5	A	B	B	A	HKY20F	18 (2.0N·m)
RBH**2260N**	●	22	6	15	125	15	15	15	A	B	B	A	HKY20F	18 (2.0N·m)
RBH**2270N**	●	22	7	16	125	20	20	15	A	B	B	A	HKY20F	18 (2.0N·m)
RBH2520N	●	25	2	11	150	10	—	—	A	B	—	—	HKY20F	18 (2.0N·m)
RBH**2530N**	●	25	3	12	150	10	10	—	A	B	C	—	HKY20F	18 (2.0N·m)
RBH**2540N**	●	25	4	13	150	15	15	—	A	C	C	—	HKY20F	18 (2.0N·m)
RBH**2550N**	●	25	5	14	150	15	15	—	A	C	C	—	HKY20F	18 (2.0N·m)
RBH**2560N**	●	25	6	15	150	15	15	—	A	C	C	—	HKY20F	18 (2.0N·m)
RBH**2570N**	●	25	7	16	150	20	20	—	A	C	C	—	HKY20F	18 (2.0N·m)

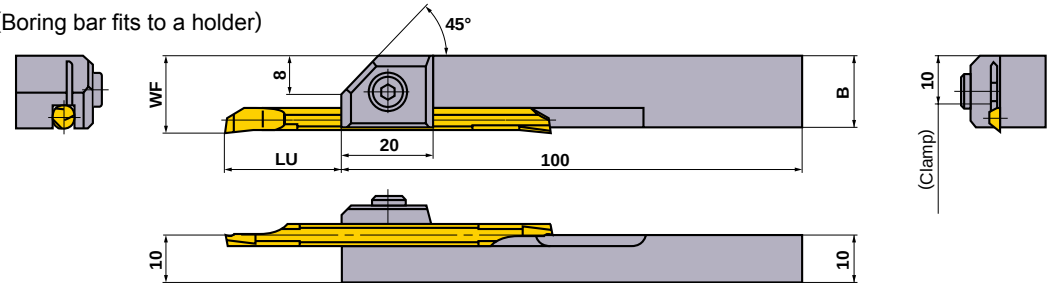
* Order number of clamp screw A=HSS04004, B=HSS04006, C=HSS04008

● : Inventory maintained. ★ : Inventory maintained in Japan.

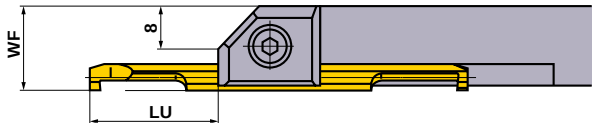
SBH

Square type holder

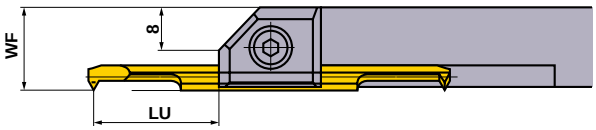
CB type (Boring bar fits to a holder)



CG type (Boring bar fits to a holder)



CT type (Boring bar fits to a holder)



Order Number	Stock	Dimensions (mm) WF			Maximum Tool Overhang **LU** (Recommended tool overhang when machining general steels)					B		MICRO-MINI TWIN				Clamp Screw	Wrench	Torque (lbf-in)
		CB type	CG type	CT type	CB type	CG..RS-10 CG..RS-10B	CG..RS-20 CG..RS-20B	CT type	CR type	CG CT·CR type	CB·CG CT·CR type	CB type	CG type	CT type	CR type			
SBH1020R	★	13	—	—	6–24 (6–10)	—	—	—	—	—	12.9	02RS(-B) 02RS-0□(B)	—	—	—	HSC 04010	HKY30R	42 (4.8N·m)
SBH**1030R**	★	14	13.8	13.8	8.5–22 (9–15)	13–17.5 (14)	14–16.5 (15)	13–17.5 (14)	11–19.5 (12)	14	13.8	03RS(-B) 03RS-0□(B)	030□RS-□□(B) 03RS-□□(B)	0305RS-M4 03RS-M4(B)	03RS-01 03RS-01B	HSC 05012	HKY40R	84 (9.5N·m)
SBH**1040R**	★	15	14.8	14.8	11–29.5 (12–20)	18–22.5 (19)	19–21.5 (20)	18.5–22 (19.5)	13–27.5 (14)	15	14.7	04RS(-B) 04RS-0□(B)	040□RS-□□(B) 04RS-□□(B)	0407RS-M6 04RS-M6(B)	04RS-01 04RS-01B	HSC 05012	HKY40R	84 (9.5N·m)
SBH**1050R**	★	16	15.8	15.8	13.5–37 (15–25)	23–27.5 (24)	24–26.5 (25)	24–26.5 (25)	15–35.5 (16)	16	15.6	05RS(-B) 05RS-0□(B)	051□RS-□□(B) 05RS-□□(B)	0510RS-M8 05RS-M8(B)	05RS-01 05RS-01B	HSC 05012	HKY40R	84 (9.5N·m)
SBH**1060R**	★	17	16.8	16.8	13.5–42 (18–30)	23–32.5 (24)	24–31.5 (25)	24–31.5 (25)	—	17	16.5	06RS(-B) 06RS-0□(B)	061□RS-□□(B) 06RS-□□(B)	0610RS-M10 06RS-M10(B)	—	HSC 05012	HKY40R	84 (9.5N·m)
SBH**1070R**	★	18	17.8	—	13.5–52 (21–35)	28–38 (29)	29–37 (30)	—	—	18	17.4	07RS(-B) 07RS-0□(B)	071□RS-□□(B) 07RS-□□(B)	—	—	HSC 05012	HKY40R	84 (9.5N·m)

★ The MICRO-DEX and the MICRO-MINI cannot be fit to square holders.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

HOLDER

HOLDER CROSS REFERENCE LIST OF METRIC SHANK STANDARD

Holder		MICRO-MINI TWIN		MICRO-DEX	MICRO-MINI	Machine Makers
Type	Order Number	CB	CR		C	
Round Type Holder ϕ16mm	**RBH1620N**	02RS(-B) 02RS-0□(B)	–	–	–	MIYANO MACHINERY JAPAN INC. NC lathes
	RBH**1630N**	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
	RBH**1640N**	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
	RBH**1650N**	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
	RBH**1660N**	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
	RBH**1670N**	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
Round Type Holder ϕ20mm	**RBH2020N**	02RS(-B) 02RS-0□(B)	–	–	–	Citizen Precision Machinery Co., Ltd. Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	RBH**2030N**	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
	RBH**2040N**	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
	RBH**2050N**	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
	RBH**2060N**	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
	RBH**2070N**	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
Round Type Holder ϕ22mm	**RBH2220N**	02RS(-B) 02RS-0□(B)	–	–	–	STAR MICRONICS CO., LTD.
	RBH**2230N**	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
	RBH**2240N**	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
	RBH**2250N**	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
	RBH**2260N**	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
	RBH**2270N**	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
Round Type Holder ϕ25mm	**RBH2520N**	02RS(-B) 02RS-0□(B)	–	–	–	Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	RBH**2530N**	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
	RBH**2540N**	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
	RBH**2550N**	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
	RBH**2560N**	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
	RBH**2570N**	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
Square Type Holder □10mm	**SBH1020R**	02RS(-B) 02RS-0□(B)	–	–	–	NC lathes
	SBH**1030R**	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	–	
	SBH**1040R**	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	–	–	
	SBH**1050R**	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	–	–	
	SBH**1060R**	06RS(-B) 06RS-0□(B)	–	–	–	
	SBH**1070R**	07RS(-B) 07RS-0□(B)	–	–	–	

∗ Mitsubishi Materials obtained the makers' approval before entering their names in the list.

BORING BARS

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

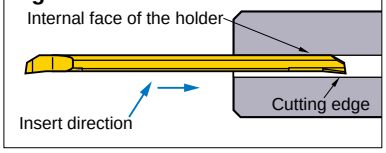
PRECAUTION IN USING THE MICRO-MINI TWIN

PRECAUTIONS IN USING THE MICRO-MINI TWIN

●When using a holder for general purpose/small automatic lathe

1 To avoid chipping of the 2nd cutting edge take care when inserting the boring bar into the holder. Refer to fig.1 if the 2nd edge contacts the internal face of the holder there is a possibility that it may chip.

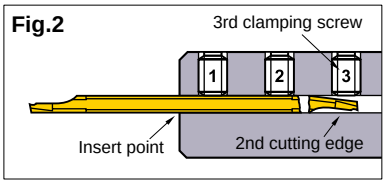
Fig.1



2 When clamping the boring bar into the holder, there is a possibility that damage to the shank and the 2nd cutting edge can occur. Make sure that the clamping screws are tightened to the set torque value. Additionally make sure that there is no clamping screw near the 2nd cutting edge as this can break the boring bar.

◎When using Mitsubishi holders with a tool overhang of5 lxd, ensure that the 3rd clamping screw is removed prior to machining. (For RBH1620N, RBH19020N there are no 3rd clamping screws). The set torque value for clamping screw is 18 lbf-in. (2.0 N • m)

Fig.2



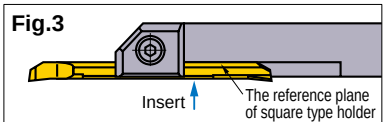
●When using a square type holder

1 When installing the boring bar into the holder, tighten the clamping screw making the micro-mini twin boring bars in contact with the reference plane of square type holder.

2 Make sure that the clamp screw is tightened. The recommended set torque value is shown in the table of holder.

3 Don't tighten the clamp screw without a micro-mini twin boring bar, otherwise the clamp bridge can be deformed.

Fig.3



Tighten the clamping screw ensuring making the micro-mini twin boring bars in contact with the reference plane of square type holder.

GUIDE TO GROOVING TOOLS

●Section organization

①Classified according to external or internal applications.
②Sub-classified according to product series.
(Refer to the index on the next page.)

[For External Grooving] [For Internal Grooving & Threading]

FIGURE SHOWING TOOLING APPLICATION
uses illustrations and arrows to depict available machining applications such as cutting off, grooving and copying.

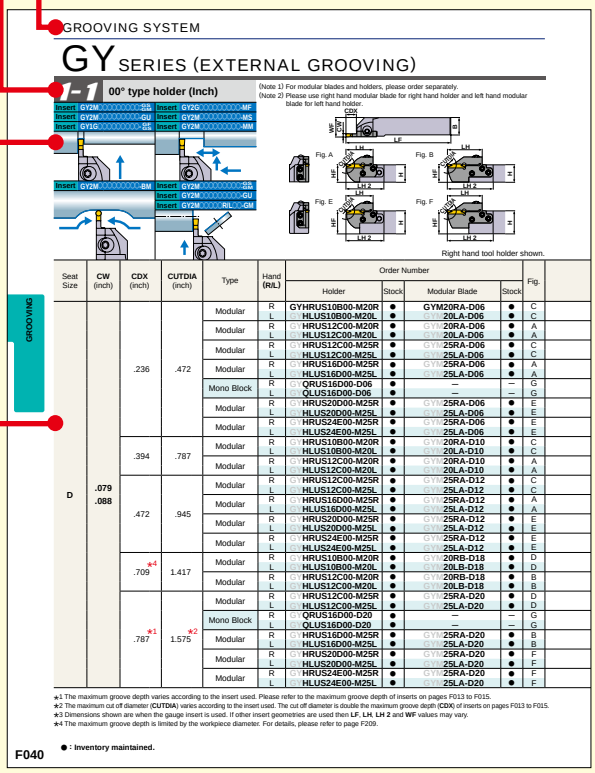
INDICATION OF HOLDER TYPE ACCORDING TO APPLICATION
indicates the holder types, such as 00º type or 90º type.

PRODUCT SECTION

MIN. CUTTING DIAMETER
is color-coded to locate at a glance, the minimum cutting diameters for internal machining.

TITLE OF PRODUCT

GEOMETRY


GROOVING SYSTEM

GY SERIES (EXTERNAL GROOVING)

1-1 00° type holder (Inch)

(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

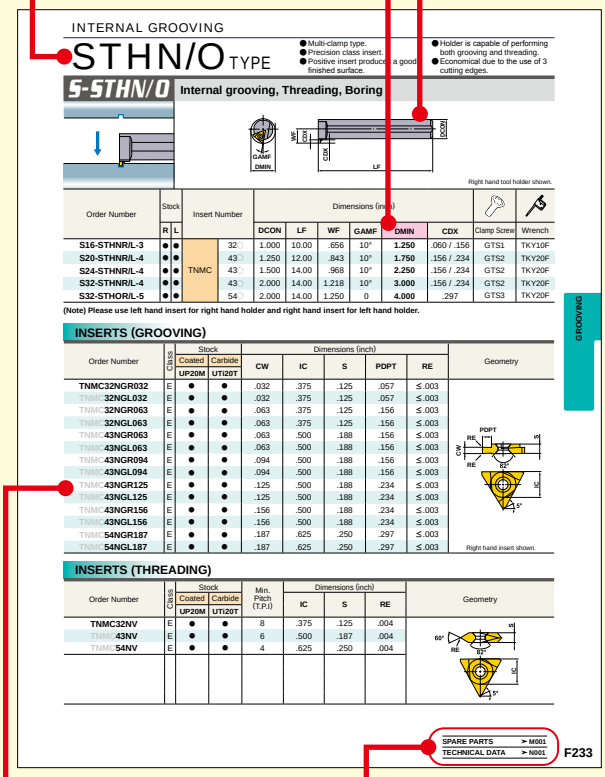
Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
D	.079 .088	.236	.472	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-D06	●	C
					L	GYHLUS10B00-M20L	●	20LA-D06	●	C
				Modular	R	GYHRUS12C00-M20R	●	20RA-D06	●	A
					L	GYHLUS12C00-M20L	●	20LA-D06	●	A
				Modular	R	GYHRUS12C00-M25R	●	25RA-D06	●	C
					L	GYHLUS12C00-M25L	●	25LA-D06	●	C
				Modular	R	GYHRUS16D00-M25R	●	25RA-D06	●	A
					L	GYHLUS16D00-M25L	●	25LA-D06	●	A
				Mono Block	R	GYQRUS16D00-D06	●	—	—	G
					L	GYQLUS16D00-D06	●	—	—	G
				Modular	R	GYHRUS20D00-M25R	●	25RA-D06	●	E
					L	GYHLUS20D00-M25L	●	25LA-D06	●	E
				Modular	R	GYHRUS24E00-M25R	●	25RA-D06	●	E
					L	GYHLUS24E00-M25L	●	25LA-D06	●	E
		.394	.787	Modular	R	GYHRUS10B00-M20R	●	20RA-D10	●	C
					L	GYHLUS10B00-M20L	●	20LA-D10	●	C
				Modular	R	GYHRUS12C00-M20R	●	20RA-D10	●	A
					L	GYHLUS12C00-M20L	●	20LA-D10	●	A
		.472	.945	Modular	R	GYHRUS12C00-M25R	●	25RA-D12	●	C
					L	GYHLUS12C00-M25L	●	25LA-D12	●	C
				Modular	R	GYHRUS16D00-M25R	●	25RA-D12	●	A
					L	GYHLUS16D00-M25L	●	25LA-D12	●	A
				Modular	R	GYHRUS20D00-M25R	●	25RA-D12	●	E
					L	GYHLUS20D00-M25L	●	25LA-D12	●	E
				Modular	R	GYHRUS24E00-M25R	●	25RA-D12	●	E
					L	GYHLUS24E00-M25L	●	25LA-D12	●	E
		.709 ★4	1.417	Modular	R	GYHRUS10B00-M20R	●	20RB-D18	●	D
					L	GYHLUS10B00-M20L	●	20LB-D18	●	D
				Modular	R	GYHRUS12C00-M20R	●	20RB-D18	●	B
					L	GYHLUS12C00-M20L	●	20LB-D18	●	B
		.787 ★1	1.575 ★2	Modular	R	GYHRUS12C00-M25R	●	25RA-D20	●	D
					L	GYHLUS12C00-M25L	●	25LA-D20	●	D
				Mono Block	R	GYQRUS16D00-D20	●	—	—	G
					L	GYQLUS16D00-D20	●	—	—	G
				Modular	R	GYHRUS16D00-M25R	●	25RA-D20	●	B
					L	GYHLUS16D00-M25L	●	25LA-D20	●	B
				Modular	R	GYHRUS20D00-M25R	●	25RA-D20	●	F
					L	GYHLUS20D00-M25L	●	25LA-D20	●	F
				Modular	R	GYHRUS24E00-M25R	●	25RA-D20	●	F
					L	GYHLUS24E00-M25L	●	25LA-D20	●	F

★1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
★2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
★3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.
★4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

● : Inventory maintained.

F040


INTERNAL GROOVING

STHN/O TYPE

● Multi-clamp type.
● Precision class insert.
● Positive insert produces a good finished surface.
● Holder is capable of performing both grooving and threading.
● Economical due to the use of 3 cutting edges.

S-STHN/O Internal grooving, Threading, Boring

Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number	Dimensions (inch) DCON	LF	WF	GAMF	DMIN	CDX	Clamp Screw	Wrench
S16-STHNR/L-3	●	●	TNMC 32	1.000	10.00	.656	10°	1.250	.060 / .156	GTS1	TKY10F
S20-STHNR/L-4	●	●	TNMC 43	1.250	12.00	.843	10°	1.750	.156 / .234	GTS2	TKY20F
S24-STHNR/L-4	●	●	TNMC 43	1.500	14.00	.968	10°	2.250	.156 / .234	GTS2	TKY20F
S32-STHNR/L-4	●	●	TNMC 43	2.000	14.00	1.218	10°	3.000	.156 / .234	GTS2	TKY20F
S32-STHOR/L-5	●	●	TNMC 54	2.000	14.00	1.250	0	4.000	.297	GTS3	TKY20F

(Note) Please use left hand insert for right hand holder and right hand insert for left hand holder.

INSERTS (GROUVING)

Order Number	Class	Stock Coated UP20M	Stock Carbide UTi20T	Dimensions (inch) CW	IC	S	PDPT	RE	Geometry
TNMC32NGR032	E	●	●	.032	.375	.125	.057	≤.003	
TNMC32NGL032	E	●	●	.032	.375	.125	.057	≤.003	
TNMC32NGR063	E	●	●	.063	.375	.125	.156	≤.003	
TNMC32NGL063	E	●	●	.063	.375	.125	.156	≤.003	
TNMC43NGR063	E	●	●	.063	.500	.188	.156	≤.003	
TNMC43NGL063	E	●	●	.063	.500	.188	.156	≤.003	
TNMC43NGR094	E	●	●	.094	.500	.188	.156	≤.003	
TNMC43NGL094	E	●	●	.094	.500	.188	.156	≤.003	
TNMC43NGR125	E	●	●	.125	.500	.188	.234	≤.003	
TNMC43NGL125	E	●	●	.125	.500	.188	.234	≤.003	
TNMC43NGR156	E	●	●	.156	.500	.188	.234	≤.003	
TNMC43NGL156	E	●	●	.156	.500	.188	.234	≤.003	
TNMC54NGR187	E	●	●	.187	.625	.250	.297	≤.003	
TNMC54NGL187	E	●	●	.187	.625	.250	.297	≤.003	

Right hand insert shown.

INSERTS (THREADING)

Order Number	Class	Stock Coated UP20M	Stock Carbide UTi20T	Min. Pitch (T.P.I)	Dimensions (inch) IC	S	RE	Geometry
TNMC32NV	E	●	●	8	.375	.125	.004	
TNMC43NV	E	●	●	6	.500	.187	.004	
TNMC54NV	E	●	●	4	.625	.250	.004	

SPARE PARTS > M001
TECHNICAL DATA > N001

F233

STANDARDS FOR APPLICABLE INSERTS
indicates stock status, dimensions, etc. for applicable inserts.

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), holders, modular blades groove widths, maximum groove depths, maximum cut-off diameters, dimensions, applicable inserts, and cutting edge shapes.

LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

●To Order: For holder, please specify order number and hand of tool (right/left).
For insert, please specify insert number and grade.
For blade, please specify order number.

TURNING

GROOVING TOOLS

CLASSIFICATION (EXTERNAL CUTTING) ····· F002
CLASSIFICATION (INTERNAL CUTTING) ····· F003

STANDARD
GY HOLDER (GROOVING)
CLASSIFICATION OF GY HOLDER ····· F004
HOW TO SELECT GY HOLDER ····· F008
IDENTIFICATION OF GY SERIES ····· F010

GY INSERTS ····· F013
QUICK INDEX ····· F016
GY HOLDER (EXTERNAL) ····· F038
GY HOLDER (FACE GROOVING) ····· F086
GY HOLDER (INTERNAL) ····· F170
GY HOLDER (EXTERNAL GROOVING PSC TYPE) ····· F186

UG HOLDER (EXTERNAL GROOVING) ····· F230

MTVO HOLDER (EXTERNAL GROOVING) ····· F232

S-STHN/O HOLDER (INTERNAL GROOVING) ····· F233
FSL51/52 HOLDER (INTERNAL GROOVING) ····· F234
S-SL5N HOLDER (INTERNAL GROOVING) ····· F235

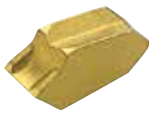
MICRO-MINI TWIN BORING BARS
CG TYPE (INTERNAL GROOVING) ····· F237

Arranged by Alphabetical order.

F237 **CG**
F234 **FSL5**
F038 **GY (Holders)**
F013 **GY (Inserts)**
F230 **KGBN**
F231 **KGT (Inserts)**
F236 **MLG (Inserts)**
F236 **MLT (Inserts)**
F232 **MTVO**
F235 **S-SL5N**
F233 **S○○-STHN**
F233 **S○○-STHO**
F232 **TNMC (Inserts)**
F230 **UGHN**

CLASSIFICATION

EXTERNAL CUTTING

Name of Tool Holder	Insert Shape	Features	Groove Width According to Cutting Mode (inch)						Page
			Shallow Grooving	Deep Grooving	Cutting Off	Copying	Recessing	Face Grooving	
GY Holder 		● Modular type. ● Clamp-on type. ● High accuracy and rigidity due to the modular blade. (Tri-lock system) ● Various insert types. ● Mono block type. ● Spring clamp type.	.059" .079" (2.0mm) .088" .094" .098" (2.5mm) .108" .118" (3.0mm) .125" .128" .157" (4.0mm) .167" .187" .197" (5.0mm) .206" .236" (6.0mm) .248" .250" .315" (8mm)			.079" (2.0mm) .098" (2.5mm) .118" (3.0mm) .125" .157" (4.0mm) .187" .197" (5.0mm) .236" (6.0mm) .250" .315" (8mm)	.079" (2.0mm) .098" (2.5mm) .118" (3.0mm) .125" .157" (4.0mm) .187" .197" (5.0mm) .236" (6.0mm) .250"	.079" (2.0mm) .088" .094" .098" (2.5mm) .108" .118" (3.0mm) .125" .128" .157" (4.0mm) .167" .187" .197" (5.0mm) .206" .236" (6.0mm) .248" .250"	F038
UG Holder 		● Spring clamp type. ● Strengthened insert clamping. ● Block and blade type. ● Maximum cut off diameter 4.724inch.	.087" .122" .161" .201"						F230
MTVO Holder 		● Multi-clamp type. ● Precision class insert. ● Positive insert produces a good finished surface. ● Holder is capable of performing both grooving and threading. ● Economical due to the use of 3 cutting edges.	.032" .063" .094" .125" .156" .187"						F232

INTERNAL CUTTING

Name of Tool Holder	Insert Shape	Features	DMIN (inch)	CW (inch)	CDX (inch)	Page
GY 		● Modular type. ● Clamp-on type. ● High accuracy and rigidity due to the modular blade. (Tri-lock system) ● Various insert types. ● Mono block type. ● Spring clamp type.	.984" (25mm)	.079" (2.0mm) .088" .094" .098" (2.5mm) .108" .118" (3.0mm) .125" .128" .157" (4.0mm) .167" .187" .197" (5.0mm) .206" .236" (6.0mm) .248" .250"	.157" ~ .512"	F170
STHN/O 		● Screw-on type. ● Precision class insert. ● Positive insert produces a good finished surface. ● Holder is capable of performing both grooving and threading. ● Economical due to the use of 3 cutting edges.	1.250"	.032" .063" .094" .125" .156" .187"	.060" ~ .297"	F233
FSL5 **S-SL5** 		● Screw-on type. ● Precision class insert. ● Holder is capable of performing both grooving and threading. ● Maximum groove depth .118inch.	.394"	.047" (1.2mm) .059" (1.5mm) .062" .079" (2.0mm) .094" .118" (3.0mm) .125" .156" .157" (4.0mm)	.039" ~ .118"	F234
MICRO-MINI TWIN Boring Bars 	–	● Solid carbide type. ● Economical due to single holder with two cutting edges.	.118"	.04" ~ .08"	.04" ~ .08"	F237
MICRO-MINI Boring Bars 	–	● Solid carbide type. ● Insert can be ground to suit the application.	.126"	.08" ~ .12"	.04" ~ .08"	E031

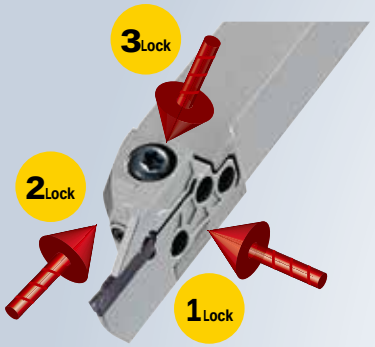
FEATURES OF THE GY SERIES

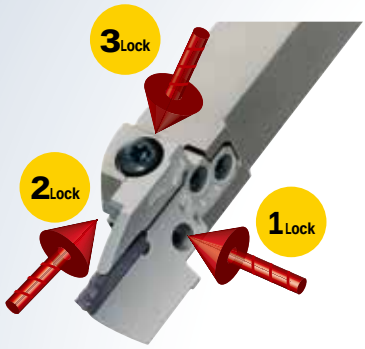
TRI-LOCK System for increased stability and performance!

Innovative TRI-LOCK System

- Mitsubishi Materials has developed a modular blade that is totally original and incomparable.* TRI-LOCK system ensures that the modular blade is securely located from 3 directions (side,front and top). This leads to high rigidity clamping and stable grooving.

*Mitsubishi Materials study data





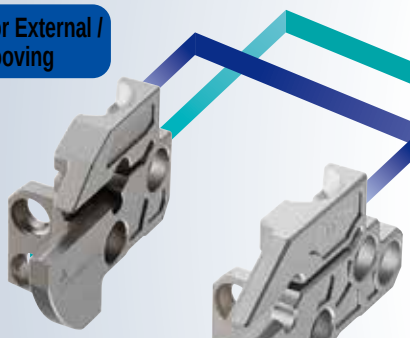


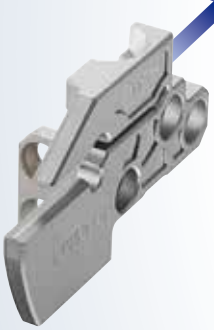




GROOVING

Modular Blade for External / Internal Grooving







Modular Blade for External Grooving

GU Breaker

(VP20RT)
(VP10RT)

GS Breaker

GM Breaker

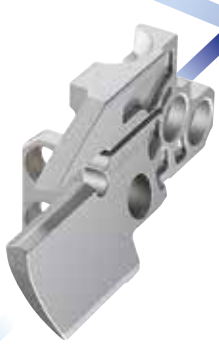
(MY5015)

Flat Top

(NX2525)

NEW MF Breaker

(CBN)





Modular Blade for Face Grooving

MS Breaker

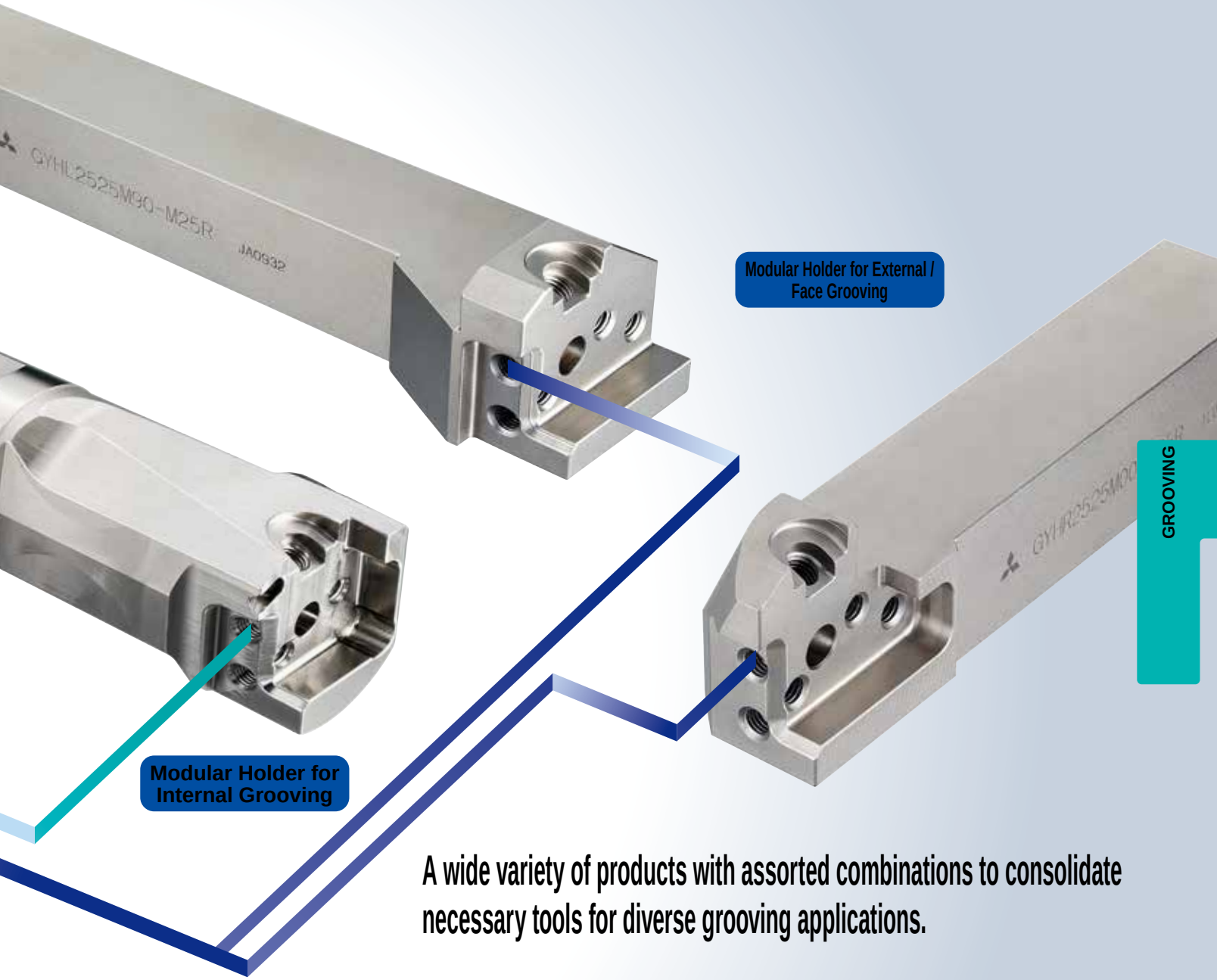
MM Breaker

BM Breaker

Blank Insert

(RT9010)
(RT9010)
(NX2525)

GY series offers ultimate rigidity and accuracy for stable grooving applications.
Modular system allows for high flexibility while maintaining overall strength comparable to a mono block type holder.

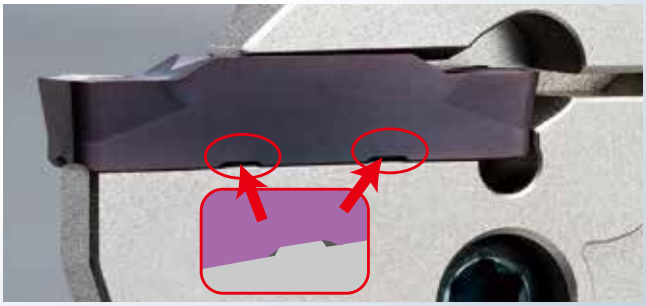


A wide variety of products with assorted combinations to consolidate necessary tools for diverse grooving applications.

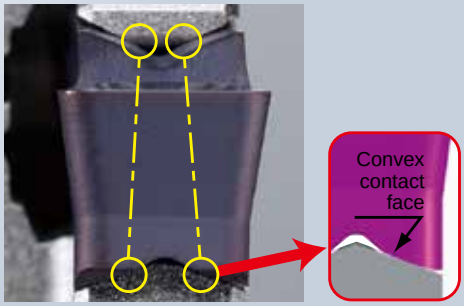
New insert design leading the way for new grooving applications !

● Highly reliable insert clamping

●Safety keys prevent insert movement.



●The convex geometry ensures high precision clamping.

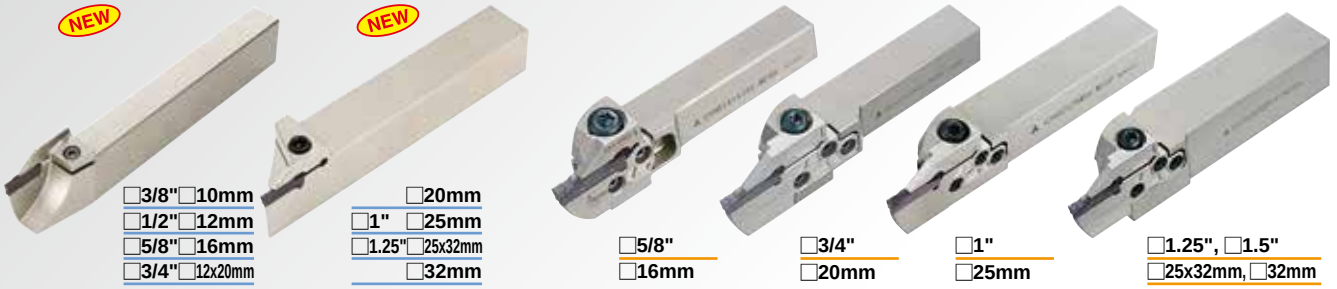


GY SERIES

A wide selection of holders and inserts available for diverse grooving applications.

External • Face holders

Corresponding blades to a variety of modular holders with different shank sizes.



Mono block type

Modular type

Modular type holders can be used over a wide range of applications by using different modular blades.



The same holder

Applicable for various diameters of face grooves by the wide array of modular blades with different grooving diameters.



Internal holders

A wide range of holders available from minimum diameter of ø25mm.

Mono block type	Modular type
Min.cutting diameter (Inch) ø1.000" ø1.250" (Metric) ø25mm ø32mm	Min.cutting diameter (Inch) ø1.625" ø2.000" ø2.500" ø2.750" (Metric) ø40mm ø50mm ø60mm ø70mm



Short shank types are stock standard.

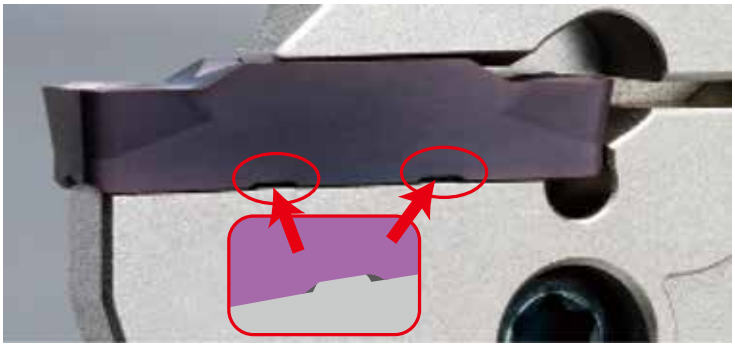
Mono block type		Modular type	
Short	Standard	Short	Standard



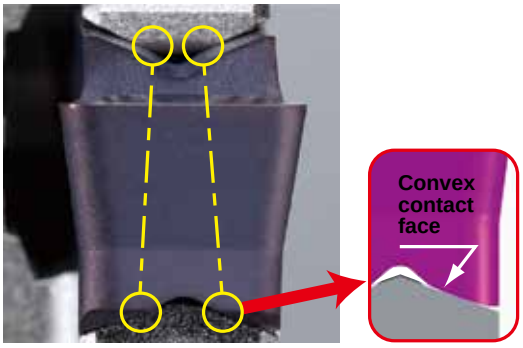
Original insert design leading the way to new grooving applications !

Highly reliable insert clamping

Safety keys prevent insert movement.



The convex geometry ensures high precision clamping.



Face grooving test results

GY series can achieve stable machining at the cutting conditions which created vibration with a conventional modular type tool.



GY

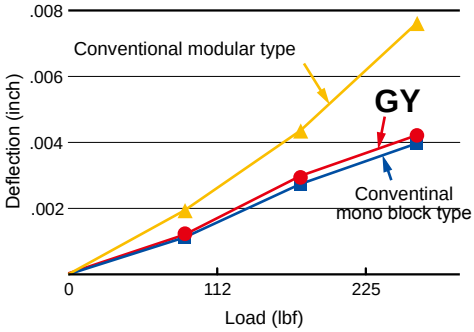


Conventional modular type

<Cutting Conditions>
Work material : AISI 4140
Insert width : .197"
Cutting speed : 490 SFM
Feed : .008 IPR
Groove depth : .906"

Rigidity comparison

The GY series provides rigidity comparable to a mono block type grooving tool.



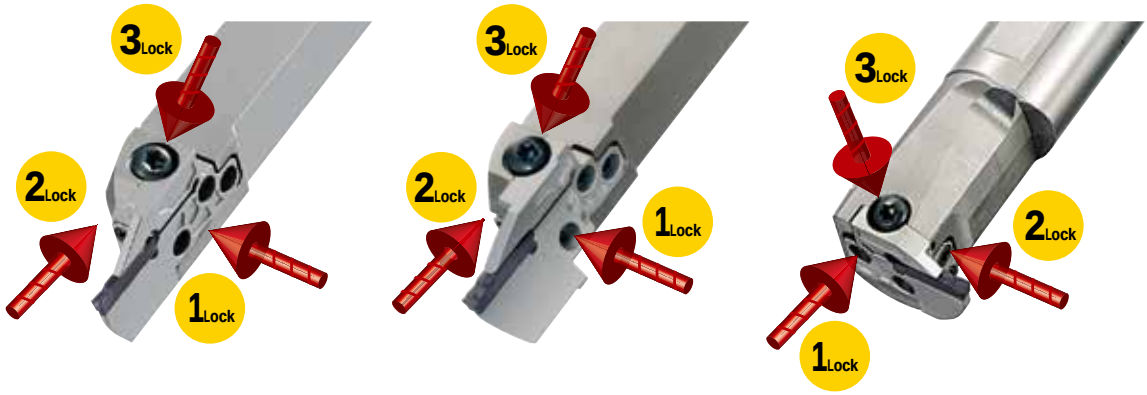


(Tool body for .197" insert)

New TRI-LOCK System for increased stability and performance!

TRI-LOCK System

The TRI-LOCK system ensures the blade is securely fixed in 3 directions (side, front and top), giving high rigidity for stable grooving performance.

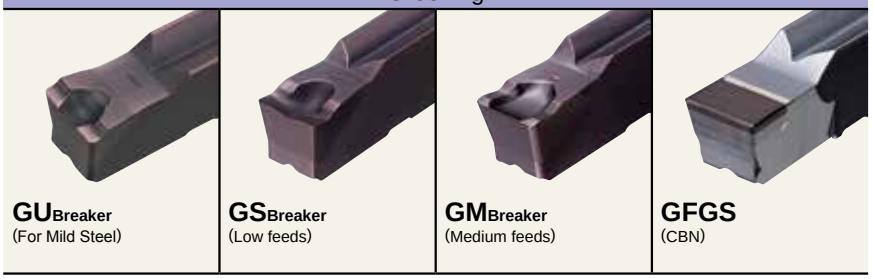


INSERT

A WIDE SELECTION OF INSERTS

● Breaker system

Grooving



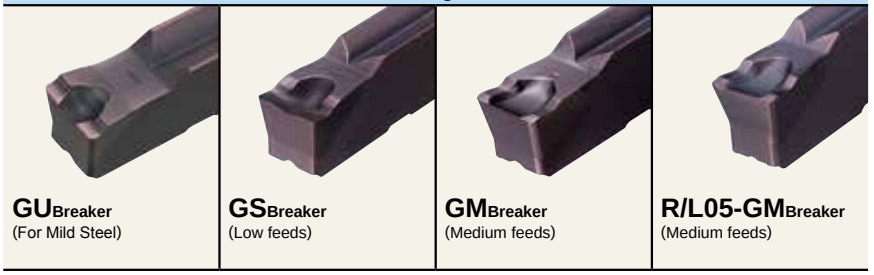
GU Breaker (For Mild Steel)	GS Breaker (Low feeds)	GM Breaker (Medium feeds)	GFGS (CBN)

For Multifunctional Grooving | **Copying/Recessing**



NEW MF Breaker (G class)	MS Breaker (Low feeds)	MM Breaker (Medium feeds)	BM Breaker

Cutting Off



GU Breaker (For Mild Steel)	GS Breaker (Low feeds)	GM Breaker (Medium feeds)	R/L05-GM Breaker (Medium feeds)

● Selection of groove widths

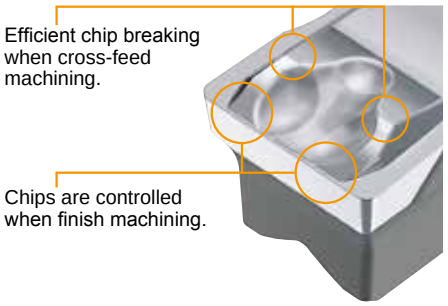


● Different corner radii available



NEW

● MF Breaker

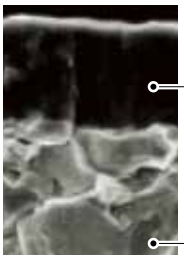


INSERT GRADE

Machining Condition \ Work Material	P Steel	M Stainless Steel	K Cast Iron	S Heat resistant Alloy / Titanium Alloy	H Hardened steel
Stable ↑ Machining Condition ↓ Unstable	NX2525 MY5015 VP10RT VP20RT	VP10RT VP20RT	MY5015 VP10RT VP20RT	VP10RT / RT9010 VP20RT	MB8025

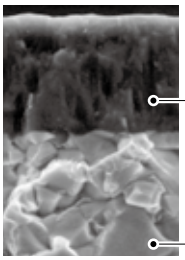
Note1) VP20RT is the first recommended grade for materials other than hardened steel.
Note2) For VP10RT, VP20RT and MY5015, wet cutting is recommended.

VP20RT (1st Recommendation)



●PVD coated grade suitable for a wide range of applications. The combination of a special tough cemented carbide substrate with MIRACLE coating provides an excellent balance of wear and fracture resistance.

VP10RT (2nd Recommendation)



●PVD coated grade with a cemented carbide substrate harder than VP20RT. For use on difficult to cut materials and for extending tool life.

MY5015



●MY5015 is a CVD coated grade with excellent wear resistance even at high temperatures. It provides longer tool life when machining cast and ductile cast irons. Also suitable for high speed continuous cutting of steels.

RT9010

●First recommended grade for titanium alloys.
It is not recommended for use on non-ferrous alloys.

NX2525

●NX2525, a cermet grade for finish machining of steels and for good surface finishes at lower cutting speeds.

MB8025

●MB8025 is a sintered CBN grade for hardened steel.

GROOVING

● BLANK INSERTS

●Blank inserts for custom grinding



1 Edge Type



2 Edge Type

✶ Blank inserts to be ground by customers.

RT9010/RT9020 for blank insert

●First recommendation for blanks inserts is RT9020 due to the tougher carbide substrate that is suitable for a wider range of applications.
RT9010 has a harder substrate than RT9020 and is ideal for longer tool life on stable cutting applications.
Both grades are recommended to have a coating applied that is suitable for the required application.

IDENTIFICATION OF GY SERIES

Insert

①	②	③	④	⑤	⑥	⑦	⑧		⑨	⑩
GY	2	M	0300	F	030	N	05	–	M	F

①Series Description

②Number of Teeth

1	1 Edge Type
2	2 Edge Type

③Peripheral

G	Ground
M	Sintered
B	Blank

④Groove Width

	Inch	Metric
0150	.059"	1.50mm
0200	.079"	2.00mm
⋮	⋮	⋮
0800	.315"	8.00mm

⑤Seat Size ✶1

	Inch	Metric
C	.059"	1.50mm
D	.079" .088"	2.00mm 2.24mm
E	.094" .098" .108"	2.39mm 2.50mm 2.74mm
F	.118" .125" .128"	3.00mm 3.18mm 3.24mm
G	.157" .167"	4.00mm 4.24mm
H	.187" .197" .206"	4.75mm 5.00mm 5.24mm
J	.236" .248" .250"	6.00mm 6.31mm 6.35mm
K	.315"	8.00mm

⑥Corner Radius

	Inch	Metric
010	.004"	0.10mm
015	.006"	0.15mm
⋮	⋮	⋮
400	.157"	4.00mm

⑦Hand

N	Neutral
R	Right
L	Left

⑧Lead angle (R/L type insert)

05	5º

⑨Application 1

G	Grooving/Cutting off
M	Multifunctional
B	Copying (Ball nose)

⑩Application 2

U	For Gummy Steel
F	Finishing
S	Low feeds
M	Medium feeds

CBN INSERT

①	②	③	④	⑤	⑥	⑦	⑨	⑪	⑫
GY	1	G	0300	F	020	N	– G	F	GS

⑪Application 3

F	Flat Top

⑫Honing Type

GS	General Purpose

✶1 Select a seat size with the same symbol as that of the modular blade and mono block holder.

Modular blade

● EXTERNAL/INTERNAL/RECESSING

①	②	③	④	⑤	⑥
GY	M25	R	A	– F	12 ✶3

①Series Description

②Modular Blade Size

M20
M25

③Hand

R	Right
L	Left

④Modular Blade Type

A	Standard Type
B	Reinforced Type
C	External Recessing
D	Face Grooving

⑤Seat Size ✶1

	Inch	Metric
D	.079" .088"	2.00mm 2.24mm
E	.094" .098" .108"	2.39mm 2.50mm 2.74mm
F	.118" .125" .128"	3.00mm 3.18mm 3.24mm
G	.157" .167"	4.00mm 4.24mm
H	.187" .197" .206"	4.75mm 5.00mm 5.24mm
J	.236" .248" .250"	6.00mm 6.31mm 6.35mm

⑥Max. Groove Depth ✶2

	Inch	Metric
005	.197"	0.5mm
06	.236"	6mm
⋮	⋮	⋮
25	.984"	25mm

● FACE GROOVING

①	②	③	④	⑤	⑥	⑦
GY	M25	R	D	– F	12	– 050

⑦Min. Groove Diameter

	Inch	Metric
035	1.378"	35mm
040	1.575"	40mm
⋮	⋮	⋮
250	9.843"	250mm

Note: Dimension symbols conforming to ISO13399.
See pages PR3-PR6 for details.

✶1 Select a seat size with the same symbol as that of the insert.
✶2 The maximum groove depth is a value when used for external grooving and changes according to the insert used. For internal grooving, refer to the maximum groove depth on pages F170—F185.
✶3 GYM20R/LA-○10, GYM20R/LA-○12, GYM25R/LA-○12 and GYM25R/LA-○14 can be used for both external and internal grooving.

EXTERNAL/FACE GROOVING/RECESSING

MONO BLOCK HOLDER

(Inch) GY P R US16 D 00 – K 25

(Metric) 2525 M

①Series Description

②Holder Type

S	Mono Block Holder for Small Lathe
P	Offset Mono Block Holder
Q	Zero Offset Mono Block Holder
H	Modular Type Holder

③Hand of Holder

R	Right
L	Left

④Holder Size

Inch		Metric	
US06	.375"x.375"	1010	10mmx10mm
US08	.500"x.500"	1212	12mmx12mm
US10	.625"x.625"	1616	16mmx16mm
US12	.750"x.750"	2012	20mmx12mm
US16	1.000"x1.000"	2020	20mmx20mm
US20	1.250"x1.250"	2525	25mmx25mm
US24	1.500"x1.500"	3225	32mmx25mm
		3232	32mmx32mm

⑤Holder Length

Inch		Metric	
B	4.5"	J	110mm
C	5.0"	JX	120mm
D	6.0"	K	125mm
E	7.0"	M	150mm
		P	170mm

⑥Angle (degree)

00	0°
50	50°
90	90°

⑦Seat Size *1

	Inch	Metric
C	.059"	1.50mm
D	.079" .088"	2.00mm 2.24mm
E	.094" .098" .108"	2.39mm 2.50mm 2.74mm
F	.118" .125" .128"	3.00mm 3.18mm 3.24mm
G	.157" .167"	4.00mm 4.24mm
H	.187" .197" .206"	4.75mm 5.00mm 5.24mm
J	.236" .248" .250"	6.00mm 6.31mm 6.35mm
K	.315"	8.00mm

⑧Max. Grooving Depth

	Inch	Metric
06	.236"	6mm
08	.315"	8mm
⋮	⋮	⋮
25	.984"	25mm

MODULAR TYPE HOLDER

(Inch) GY H R US16 M 00 – M25 R

(Metric) 2525

⑨Modular Blade Size

M20
M25

⑩Hand of Modular Blade

R	Right
L	Left

*1 Select a seat size with the same symbol as that of the insert.

INTERNAL

MONO BLOCK HOLDER

(Inch) GY A R US16 K 90 A – F 06

(Metric) 20

①Series Description

②Holder Type

A	Mono Block
D	Modular Type Holder

③Hand of Holder

R	Right
L	Left

④Shank Size

Inch		Metric	
US12	.750"	20	20mm
US16	1.000"	25	25mm
US20	1.250"	32	32mm
US24	1.500"	40	40mm
US32	2.000"	50	50mm

⑤Holder Length

	Inch	Metric
K	5.0"	125mm
L	5.5"	140mm
M	6.0"	150mm
P	6.75"	170mm
Q	7.0"	180mm
R	8.0"	200mm
S	10.0"	250mm
T	12.0"	300mm

⑥Angle (degree)

90	90°

⑦Neck Length

	Inch	Metric
A	1.250"	30mm
B	1.500"	40mm
C	2.000"	50mm
D	2.500"	60mm
F	3.250"	80mm

⑧Seat Size *1

	Inch	Metric
D	.079" .088"	2.00mm 2.24mm
E	.094" .098" .108"	2.39mm 2.50mm 2.74mm
F	.118" .125" .128"	3.00mm 3.18mm 3.24mm
G	.157" .167"	4.00mm 4.24mm
H	.187" .197" .206"	4.75mm 5.00mm 5.24mm
J	.236" .248" .250"	6.00mm 6.31mm 6.35mm

⑨Max. Grooving Depth

	Inch	Metric
06	.236"	6mm
07	.276"	7mm

MODULAR TYPE HOLDER

(Inch) GY D R US20 M 90 D – M25 L

(Metric) 40

⑩Modular Blade Size

M20
M25

⑪Hand of Modular Blade

R	Right
L	Left

GROOVING

IDENTIFICATION OF GY-PSC Holder

EXTERNAL

GY-PSC HOLDER

①	②	③	④	⑤	⑥		⑦	⑧
C4	GY	H	R	EX	00	–	M25	R

①Coupling Size

C3
C4
C5
C6

②Series Description

③Holder Type

H	Modular blade type

④Hand of Holder

R	Right
L	Left

⑤Functional Length

CX	2.165"
D	2.362"
DX	2.559"
E	2.756"
EX	2.953"
F	3.150"

⑥Angle (degree)

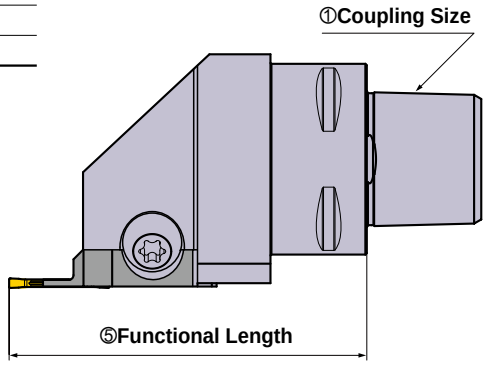
00	0°
90	90°

⑦Modular Blade Size

M20
M25

⑧Hand of Modular Blade

R	Right
L	Left



Reference data

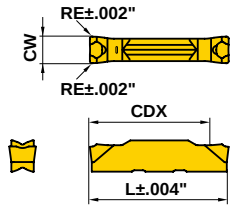
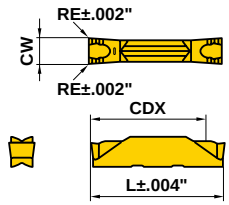
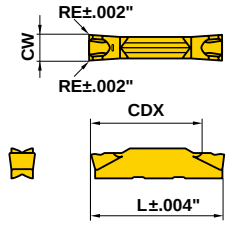
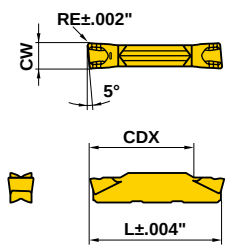
L dimension tolerance conversion table

Grooving Width CW	Dimensions L (inch) ✶1	Dimensional tolerance (inch) versus standard dimension (L) of each breaker ✶2						
		GU	GS/GM	MS/MM	R/L-GM	Flat Top	MF	BM
.059", 1.50mm	.579		0					
.079", 2.00mm	.815	0	0	0	.004	-.012	.014	.008
.088", 2.24mm	✶3 (.815)						.014	
.094", 2.39mm	.815	0	0			-.012	.014	
.098", 2.50mm	.815	0	0	0	.005	-.012	.014	.008
.108", 2.74mm	✶3 (.815)						.014	
.118", 3.00mm	.815	0	0	0	.006	-.012	.014	.008
.125", 3.18mm	.815	0	0			-.012	.014	.008
.128", 3.24mm	✶3 (.815)						.014	
.157", 4.00mm	1.010	0	0	0	.008	-.014	.012	.006
.167", 4.24mm	✶3 (1.010)						.012	
.187", 4.75mm	1.010	0	0			-.014	.012	.006
.197", 5.00mm	1.010	0	0	0	.012	-.014	.012	.006
.206", 5.24mm	✶3 (1.010)						.012	
.236", 6.00mm	1.010	0	0	0			.012	.010
.248", 6.31mm	✶3 (1.010)						.012	
.250", 6.35mm	1.010	0	0				.012	.010
.315", 8.00mm	1.201		0	0				.012

✶1 This value is used at the described holder dimension.
✶2 ▢ when there is no applicable breaker.
✶3 The dimension is the value for approximate cutting width.

GY INSERTS

INSERTS

Applications	Geometry	Order Number	Stock: Coated VP10RT	Coated VP20RT	Coated MY5015	Cermet NX2525	Carbide RT9010	Carbide RT9020	CBN MB8025	Seat Size	Dimensions (inch): CW Grooving Width	CW Tolerance	RE	CDX	*1 L
For Grooving / Cutting off	**GU Breaker** (For mild steel) 	GY2M0200D020N-GU	●	●		●				D	.079	±.0012	.008	.776	.815
		GY2M0239E020N-GU	●	●		●				E	.094	±.0012	.008	.780	.815
		GY2M0250E020N-GU	●	●		●				E	.098	±.0012	.008	.768	.815
		GY2M0300F030N-GU	●	●		●				F	.118	±.0012	.012	.760	.815
		GY2M0318F030N-GU	●	●		●				F	.125	±.0012	.012	.760	.815
		GY2M0400G030N-GU	●	●		●				G	.157	±.0016	.012	.953	1.010
		GY2M0475H040N-GU	●	●		●				H	.187	±.0016	.016	.953	1.010
		GY2M0500H040N-GU	●	●		●				H	.197	±.0016	.016	.953	1.010
		GY2M0600J040N-GU	●	●		●				J	.236	±.0016	.016	.953	1.010
		GY2M0635J040N-GU	●	●		●				J	.250	±.0016	.016	.953	1.010
	GS Breaker (Low feeds) 	NEW GY2M0150C010N-GS	●	●		●				C	.059	±.0012	.004	.528	.579
		GY2M0200D020N-GS	●	●		●				D	.079	±.0012	.008	.736	.815
		GY2M0239E020N-GS	●	●		●				E	.094	±.0012	.008	.728	.815
		GY2M0250E020N-GS	●	●		●				E	.098	±.0012	.008	.728	.815
		GY2M0300F020N-GS	●	●		●				F	.118	±.0012	.008	.728	.815
		GY2M0318F020N-GS	●	●		●				F	.125	±.0012	.008	.728	.815
		GY2M0400G020N-GS	●	●		●				G	.157	±.0016	.008	.941	1.010
		GY2M0475H030N-GS	●	●		●				H	.187	±.0016	.012	.941	1.010
		GY2M0500H030N-GS	●	●		●				H	.197	±.0016	.012	.945	1.010
		GY2M0600J030N-GS	●	●		●				J	.236	±.0016	.012	.949	1.010
		GY2M0635J030N-GS	●	●		●				J	.250	±.0016	.012	.949	1.010
		NEW GY2M0800K030N-GS	●	●						K	.315	±.0016	.012	1.146	1.201
	GM Breaker (Medium feeds) 	NEW GY2M0150C020N-GM	●	●		●				C	.059	±.0012	.008	.547	.579
		GY2M0200D020N-GM	●	●	●	●				D	.079	±.0012	.008	.764	.815
		GY2M0239E020N-GM	●	●	●	●				E	.094	±.0012	.008	.764	.815
		GY2M0250E020N-GM	●	●	●	●				E	.098	±.0012	.008	.764	.815
		GY2M0300F030N-GM	●	●	●	●				F	.118	±.0012	.012	.764	.815
		GY2M0318F030N-GM	●	●	●	●				F	.125	±.0012	.012	.764	.815
		GY2M0400G030N-GM	●	●	●	●				G	.157	±.0016	.012	.961	1.010
		GY2M0475H040N-GM	●	●	●	●				H	.187	±.0016	.016	.957	1.010
		GY2M0500H040N-GM	●	●	●	●				H	.197	±.0016	.016	.957	1.010
		GY2M0600J040N-GM	●	●	●	●				J	.236	±.0016	.016	.957	1.010
		GY2M0635J040N-GM	●	●	●	●				J	.250	±.0016	.016	.957	1.010
		NEW GY2M0800K050N-GM	●	●	●					K	.315	±.0016	.020	1.154	1.201
For Cutting off	**R/L05-GM Breaker**  Right hand insert shown.	GY2M0200D020R05-GM	●	●						D	.079	±.0012	.008	.768	.819
		GY2M0200D020L05-GM	●	●						D	.079	±.0012	.008	.768	.819
		GY2M0250E020R05-GM	●	●						E	.098	±.0012	.008	.768	.820
		GY2M0250E020L05-GM	●	●						E	.098	±.0012	.008	.768	.820
		GY2M0300F030R05-GM	●	●						F	.118	±.0012	.012	.768	.821
		GY2M0300F030L05-GM	●	●						F	.118	±.0012	.012	.768	.821
		GY2M0400G030R05-GM	●	●						G	.157	±.0016	.012	.965	1.018
		GY2M0400G030L05-GM	●	●						G	.157	±.0016	.012	.965	1.018
		GY2M0500H040R05-GM	●	●						H	.197	±.0016	.016	.965	1.022
		GY2M0500H040L05-GM	●	●						H	.197	±.0016	.016	.965	1.022

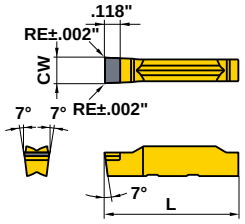
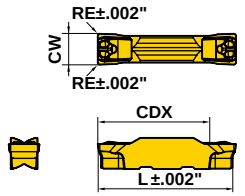
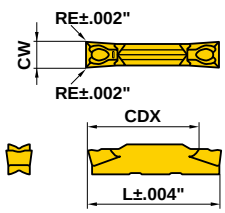
*1 L dimension depends on the breaker. Refer to F012 table.

GROOVING

● : Inventory maintained. (10 inserts in one case) (CBN inserts are available in 1 piece in one case.)

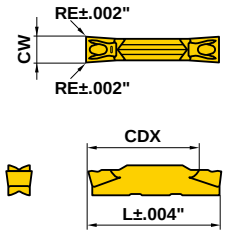
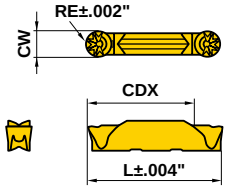
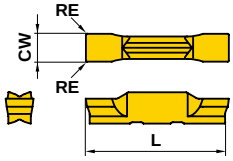
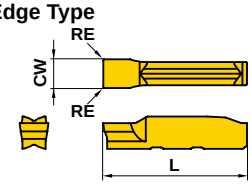
GY INSERTS

INSERTS

Applications	Geometry	Order Number	Stock: Coated VP10RT	Coated VP20RT	Cermet MY5015	Cermet NX2525	Carbide RT9010	Carbide RT9020	CBN MB8025	Seat Size	Dimensions (inch): CW Grooving Width	CW Tolerance	RE	CDX	L
For Grooving	**Flat Top** (For Hardened material) 	GY1G0200D020N-GFGS							●	D	.079	±.0012	.008	–	.815
		GY1G0239E020N-GFGS							●	E	.094	±.0012	.008	–	.815
		GY1G0250E020N-GFGS							●	E	.098	±.0012	.008	–	.815
		GY1G0300F020N-GFGS							●	F	.118	±.0012	.008	–	.815
		GY1G0318F020N-GFGS							●	F	.125	±.0012	.008	–	.815
		GY1G0400G020N-GFGS							●	G	.157	±.0012	.008	–	1.010
		GY1G0475H020N-GFGS							●	H	.187	±.0012	.008	–	1.010
		GY1G0500H020N-GFGS							●	H	.197	±.0012	.008	–	1.010
For Multifunctional Grooving	**MF Breaker** (Finishing) NEW 	GY2G0200D020N-MF	●	●		●		●		D	.079	±.0008	.008	.768	.829
		★1GY2G0224D015N-MF	●	●		●		●		D	.088	±.0008	.006	.780	.829
		GY2G0239E020N-MF	●	●		●		●		E	.094	±.0008	.008	.756	.829
		GY2G0250E020N-MF	●	●		●		●		E	.098	±.0008	.008	.764	.829
		★1GY2G0274E020N-MF	●	●		●		●		E	.108	±.0008	.008	.776	.829
		GY2G0300F020N-MF	●	●		●		●		F	.118	±.0008	.008	.768	.829
		GY2G0300F040N-MF	●	●		●		●		F	.118	±.0008	.016	.760	.829
		GY2G0318F020N-MF	●	●		●		●		F	.125	±.0008	.008	.768	.829
		GY2G0318F040N-MF	●	●		●		●		F	.125	±.0008	.016	.760	.829
		★1GY2G0324F020N-MF	●	●		●		●		F	.128	±.0008	.008	.768	.829
		GY2G0400G020N-MF	●	●		●		●		G	.157	±.0008	.008	.980	1.022
		GY2G0400G040N-MF	●	●		●		●		G	.157	±.0008	.016	.972	1.022
		GY2G0400G080N-MF	●	●		●		●		G	.157	±.0008	.031	.957	1.022
		★1GY2G0424G020N-MF	●	●		●		●		G	.167	±.0008	.008	.980	1.022
		GY2G0475H020N-MF	●	●		●		●		H	.187	±.0008	.008	.961	1.022
		GY2G0475H040N-MF	●	●		●		●		H	.187	±.0008	.016	.953	1.022
		GY2G0475H080N-MF	●	●		●		●		H	.187	±.0008	.031	.937	1.022
		GY2G0500H020N-MF	●	●		●		●		H	.197	±.0008	.008	.961	1.022
		GY2G0500H040N-MF	●	●		●		●		H	.197	±.0008	.016	.953	1.022
		GY2G0500H080N-MF	●	●		●		●		H	.197	±.0008	.031	.937	1.022
		★1GY2G0524H020N-MF	●	●		●		●		H	.206	±.0008	.008	.961	1.022
		GY2G0600J020N-MF	●	●		●		●		J	.236	±.0008	.008	.961	1.022
		GY2G0600J040N-MF	●	●		●		●		J	.236	±.0008	.016	.953	1.022
		GY2G0600J080N-MF	●	●		●		●		J	.236	±.0008	.031	.937	1.022
		★1GY2G0631J020N-MF	●	●		●		●		J	.248	±.0008	.008	.961	1.022
		GY2G0635J020N-MF	●	●		●		●		J	.250	±.0008	.008	.961	1.022
		GY2G0635J040N-MF	●	●		●		●		J	.250	±.0008	.016	.953	1.022
		GY2G0635J080N-MF	●	●		●		●		J	.250	±.0008	.031	.937	1.022
	MS Breaker (Low feeds) 	GY2M0200D020N-MS	●	●	●	●				D	.079	±.0012	.008	.752	.815
		GY2M0250E020N-MS	●	●	●	●				E	.098	±.0012	.008	.752	.815
		GY2M0300F020N-MS	●	●	●	●				F	.118	±.0012	.008	.756	.815
		GY2M0300F040N-MS	●	●	●	●				F	.118	±.0012	.016	.744	.815
		GY2M0400G020N-MS	●	●	●	●				G	.157	±.0016	.008	.953	1.010
		GY2M0400G040N-MS	●	●	●	●				G	.157	±.0016	.016	.941	1.010
		GY2M0500H040N-MS	●	●	●	●				H	.197	±.0016	.016	.941	1.010
		GY2M0500H080N-MS	●	●	●	●				H	.197	±.0016	.031	.925	1.010
		GY2M0600J040N-MS	●	●	●	●				J	.236	±.0016	.016	.941	1.010
		GY2M0600J080N-MS	●	●	●	●				J	.236	±.0016	.031	.925	1.010
		NEW GY2M0800K080N-MS	●	●	●					K	.315	±.0016	.031	1.122	1.201

★1 Groove width corresponding to the circlip.

●: Inventory maintained. (10 inserts in one case) (CBN inserts are available in 1 piece in one case.) ★: Inventory maintained in Japan.

Applications	Geometry	Order Number	Stock								Seat Size	Dimensions (inch)				
			Coated			Cermet		Carbide		CBN		CW		RE	CDX	L
			VP10RT	VP20RT	MY5015	NX2525		RT9010	RT9020	MB8025		Grooving Width	Tolerance			
For Multifunctional Grooving	**MM Breaker** (Medium feeds) 	**GY2M0200D020N-MM**	●	●	●	●					D	.079	±.0012	.008	.752	.815
		GY2M**0250E020N-MM**	●	●	●	●					E	.098	±.0012	.008	.752	.815
		GY2M**0300F020N-MM**	●	●	●	●					F	.118	±.0012	.008	.752	.815
		GY2M**0300F040N-MM**	●	●	●	●					F	.118	±.0012	.016	.744	.815
		GY2M**0300F080N-MM**	●	●	●	●					F	.118	±.0012	.031	.728	.815
		GY2M**0400G020N-MM**	●	●	●	●					G	.157	±.0016	.008	.949	1.010
		GY2M**0400G040N-MM**	●	●	●	●					G	.157	±.0016	.016	.941	1.010
		GY2M**0400G080N-MM**	●	●	●	●					G	.157	±.0016	.031	.925	1.010
		GY2M**0500H040N-MM**	●	●	●	●					H	.197	±.0016	.016	.941	1.010
		GY2M**0500H080N-MM**	●	●	●	●					H	.197	±.0016	.031	.925	1.010
		GY2M**0600J040N-MM**	●	●	●	●					J	.236	±.0016	.016	.941	1.010
		GY2M**0600J080N-MM**	●	●	●	●					J	.236	±.0016	.031	.925	1.010
		NEW GY2M**0800K080N-MM**	●	●	●						K	.315	±.0016	.031	1.122	1.201
		NEW GY2M**0800K120N-MM**	●	●	●						K	.315	±.0016	.047	1.106	1.201
For Copying / Recessing	**BM Breaker** 	**GY2M0200D100N-BM**	●	●	●	●					D	.079	±.0012	.039	.768	.815
		GY2M**0250E125N-BM**	●	●	●	●					E	.098	±.0012	.049	.760	.815
		GY2M**0300F150N-BM**	●	●	●	●					F	.118	±.0012	.059	.748	.823
		GY2M**0318F159N-BM**	●	●	●	●					F	.125	±.0012	.063	.744	.823
		GY2M**0400G200N-BM**	●	●	●	●					G	.157	±.0016	.079	.921	1.016
		GY2M**0475H238N-BM**	●	●	●	●					H	.187	±.0016	.094	.902	1.016
		GY2M**0500H250N-BM**	●	●	●	●					H	.197	±.0016	.098	.898	1.016
		GY2M**0600J300N-BM**	●	●	●	●					J	.236	±.0016	.118	.886	1.020
		GY2M**0635J318N-BM**	●	●	●	●					J	.250	±.0016	.125	.878	1.020
		NEW GY2M**0800K400N-BM**	●	●	●						K	.315	±.0016	.157	1.043	1.213
Blank ✶2	**2 Edge Type** 	**GY2B0220D020N**				★		★	★		D	.087	±.0039	.008	–	.829
		GY2B**0270E020N**				★		★	★		E	.106	±.0039	.008	–	.829
		GY2B**0340F020N**				★		★	★		F	.134	±.0039	.008	–	.829
		GY2B**0420G020N**				★		★	★		G	.165	±.0039	.008	–	1.024
		GY2B**0520H020N**				★		★	★		H	.205	±.0039	.008	–	1.024
		GY2B**0655J020N**				★		★	★		J	.258	±.0039	.008	–	1.024
	1 Edge Type 	**GY1B0220D020N**				★		★	★		D	.087	±.0039	.008	–	.827
		GY1B**0270E020N**				★		★	★		E	.106	±.0039	.008	–	.827
		GY1B**0340F020N**				★		★	★		F	.134	±.0039	.008	–	.827
		GY1B**0420G020N**				★		★	★		G	.165	±.0039	.008	–	1.020
		GY1B**0520H020N**				★		★	★		H	.205	±.0039	.008	–	1.020
		GY1B**0655J020N**				★		★	★		J	.258	±.0039	.008	–	1.020

✶2 Blank inserts to be ground by customers.

QUICK INDEX

Modular Blades Selection Chart (For External and Internal Grooving)

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
D	GYM20RA-D06	External	00°	Inch	GYHRUS10B00-M20R	R	F040
					GYHRUS12C00-M20R	R	
					C3-GYHRDX00-M20R	R	F186
				Metric	GYHR1616J00-M20R	R	F064
					GYHR2020K00-M20R	R	
			90°	Inch	GYHLUS12C90-M20R	L	F054
					C3-GYHLCX90-M20R	L	F196
				Metric	GYHL2020K90-M20R	L	F078
	GYM20LA-D06	External	00°	Inch	GYHLUS10B00-M20L	L	F040
					GYHLUS12C00-M20L	L	
					C3-GYHLDX00-M20L	L	F186
				Metric	GYHL1616J00-M20L	L	F064
					GYHL2020K00-M20L	L	
			90°	Inch	GYHRUS12C90-M20L	R	F054
					C3-GYHRCX90-M20L	R	F196
				Metric	GYHR2020K90-M20L	R	F078
	GYM20RA-D10	External	00°	Inch	GYHRUS10B00-M20R	R	F040
					GYHRUS12C00-M20R	R	
					C3-GYHRDX00-M20R	R	F186
				Metric	GYHR1616J00-M20R	R	F064
					GYHR2020K00-M20R	R	
			90°	Inch	GYHLUS12C90-M20R	L	F054
					C3-GYHLCX90-M20R	L	F196
				Metric	GYHL2020K90-M20R	L	F078
		Internal	90°	Inch	GYDLUS20L90C-M20R	L	F170
					GYDLUS20S90C-M20R	L	
					GYDLUS24M90D-M20R	L	
					GYDLUS24T90D-M20R	L	
				Metric	GYDL32L90C-M20R	L	F178
					GYDL32S90C-M20R	L	
					GYDL40M90D-M20R	L	
					GYDL40T90D-M20R	L	
	GYM20LA-D10	External	00°	Inch	GYHLUS10B00-M20L	L	F040
					GYHLUS12C00-M20L	L	
					C3-GYHLDX00-M20L	L	F186
				Metric	GYHL1616J00-M20L	L	F064
					GYHL2020K00-M20L	L	
			90°	Inch	GYHRUS12C90-M20L	R	F054
					C3-GYHRCX90-M20L	R	F196
				Metric	GYHR2020K90-M20L	R	F078
		Internal	90°	Inch	GYDRUS20L90C-M20L	R	F170
					GYDRUS20S90C-M20L	R	
					GYDRUS24M90D-M20L	R	
					GYDRUS24T90D-M20L	R	
				Metric	GYDR32L90C-M20L	R	F178
					GYDR32S90C-M20L	R	
					GYDR40M90D-M20L	R	
					GYDR40T90D-M20L	R	
	GYM20RB-D18	External	00°	Inch	GYHRUS10B00-M20R	R	F040
					GYHRUS12C00-M20R	R	
					C3-GYHRDX00-M20R	R	F186
				Metric	GYHR1616J00-M20R	R	F064
					GYHR2020K00-M20R	R	
			90°	Inch	GYHLUS12C90-M20R	L	F054
					C3-GYHLCX90-M20R	L	F196
				Metric	GYHL2020K90-M20R	L	F078
	GYM20LB-D18	External	00°	Inch	GYHLUS10B00-M20L	L	F040
					GYHLUS12C00-M20L	L	
					C3-GYHLDX00-M20L	L	F186
				Metric	GYHL1616J00-M20L	L	F064
					GYHL2020K00-M20L	L	
			90°	Inch	GYHRUS12C90-M20L	R	F054
					C3-GYHRCX90-M20L	R	F196
				Metric	GYHR2020K90-M20L	R	F078

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
D	GYM25RA-D06	External	00°	Inch	GYHRUS12C00-M25R	R	F040
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F186
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F064
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F054
					C4-GYHLD90-M25R	L	F196
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F078
	GYM25LA-D06	External	00°	Inch	GYHLUS12C00-M25L	L	F040
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F186
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F064
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F054
					C4-GYHRD90-M25L	R	F196
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F078
	GYM25RA-D12	External	00°	Inch	GYHRUS12C00-M25R	R	F040
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F186
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F064
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F054
					C4-GYHLD90-M25R	L	F196
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F078
		Internal	90°	Inch	GYDLUS24M90D-M25R	L	F170
					GYDLUS24T90D-M25R	L	
					GYDLUS32P90F-M25R	L	
					GYDLUS32T90F-M25R	L	
				Metric	GYDL40M90D-M25R	L	F178
					GYDL40T90D-M25R	L	
					GYDL50P90F-M25R	L	
					GYDL50T90F-M25R	L	

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
D	GYM25LA-D12	External	00°	Inch	GYHLUS12C00-M25L	L	F040
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F186
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F064
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F054
					C4-GYHRD90-M25L	R	F196
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F078
		Internal	90°	Inch	GYDRUS24M90D-M25L	R	F170
					GYDRUS24T90D-M25L	R	
					GYDRUS32P90F-M25L	R	
					GYDRUS32T90F-M25L	R	
				Metric	GYDR40M90D-M25L	R	F178
					GYDR40T90D-M25L	R	
					GYDR50P90F-M25L	R	
					GYDR50T90F-M25L	R	
	GYM25RA-D20	External	00°	Inch	GYHRUS12C00-M25R	R	F040
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F186
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F064
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F054
					C4-GYHLD90-M25R	L	F196
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F078
	GYM25LA-D20	External	00°	Inch	GYHLUS12C00-M25L	L	F040
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F186
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F064
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F054
					C4-GYHRD90-M25L	R	F196
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F078

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
E	GYM20RA-E06	External	00°	Inch	GYHRUS10B00-M20R	R	F042
					GYHRUS12C00-M20R	R	
					C3-GYHRDX00-M20R	R	F186
				Metric	GYHR1616J00-M20R	R	F066
					GYHR2020K00-M20R	R	
			90°	Inch	GYHLUS12C90-M20R	L	F054
					C3-GYHLCX90-M20R	L	F198
				Metric	GYHL2020K90-M20R	L	F078
	GYM20LA-E06	External	00°	Inch	GYHLUS10B00-M20L	L	F042
					GYHLUS12C00-M20L	L	
					C3-GYHLDX00-M20L	L	F188
				Metric	GYHL1616J00-M20L	L	F066
					GYHL2020K00-M20L	L	
			90°	Inch	GYHRUS12C90-M20L	R	F054
					C3-GYHRCX90-M20L	R	F198
				Metric	GYHR2020K90-M20L	R	F078
	GYM20RA-E10	External	00°	Inch	GYHRUS10B00-M20R	R	F042
					GYHRUS12C00-M20R	R	
					C3-GYHRDX00-M20R	R	F188
				Metric	GYHR1616J00-M20R	R	F066
					GYHR2020K00-M20R	R	
			90°	Inch	GYHLUS12C90-M20R	L	F054
					C3-GYHLCX90-M20R	L	F198
				Metric	GYHL2020K90-M20R	L	F078
		Internal	90°	Inch	GYDLUS20L90C-M20R	L	F172
					GYDLUS20S90C-M20R	L	
					GYDLUS24M90D-M20R	L	
					GYDLUS24T90D-M20R	L	
				Metric	GYDL32L90C-M20R	L	F180
					GYDL32S90C-M20R	L	
					GYDL40M90D-M20R	L	
					GYDL40T90D-M20R	L	
	GYM20LA-E10	External	00°	Inch	GYHLUS10B00-M20L	L	F042
					GYHLUS12C00-M20L	L	
					C3-GYHLDX00-M20L	L	F188
				Metric	GYHL1616J00-M20L	L	F066
					GYHL2020K00-M20L	L	
			90°	Inch	GYHRUS12C90-M20L	R	F054
					C3-GYHRCX90-M20L	R	F198
				Metric	GYHR2020K90-M20L	R	F078
		Internal	90°	Inch	GYDRUS20L90C-M20L	R	F172
					GYDRUS20S90C-M20L	R	
					GYDRUS24M90D-M20L	R	
					GYDRUS24T90D-M20L	R	
				Metric	GYDR32L90C-M20L	R	F180
					GYDR32S90C-M20L	R	
					GYDR40M90D-M20L	R	
					GYDR40T90D-M20L	R	
	GYM20RB-E18	External	00°	Inch	GYHRUS10B00-M20R	R	F042
					GYHRUS12C00-M20R	R	
					C3-GYHRDX00-M20R	R	F188
				Metric	GYHR1616J00-M20R	R	F066
					GYHR2020K00-M20R	R	
			90°	Inch	GYHLUS12C90-M20R	L	F054
					C3-GYHLCX90-M20R	L	F198
				Metric	GYHL2020K90-M20R	L	F078
	GYM20LB-E18	External	00°	Inch	GYHLUS10B00-M20L	L	F042
					GYHLUS12C00-M20L	L	
					C3-GYHLDX00-M20L	L	F188
				Metric	GYHL1616J00-M20L	L	F066
					GYHL2020K00-M20L	L	
			90°	Inch	GYHRUS12C90-M20L	R	F054
					C3-GYHRCX90-M20L	R	F198
				Metric	GYHR2020K90-M20L	R	F078

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Modular Blades Selection Chart (For External and Internal Grooving)

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
E	GYM25RA-E06	External	00°	Inch	GYHRUS12C00-M25R	R	F042
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F188
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F066
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F054
					C4-GYHLD90-M25R	L	F198
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F078
	GYM25LA-E06	External	00°	Inch	GYHLUS12C00-M25L	L	F042
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F188
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F066
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F054
					C4-GYHRD90-M25L	R	F198
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F078
	GYM25RA-E12	External	00°	Inch	GYHRUS12C00-M25R	R	F042
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F188
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F066
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F054
					C4-GYHLD90-M25R	L	F198
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F078
		Internal	90°	Inch	GYDLUS24M90D-M25R	L	F172
					GYDLUS24T90D-M25R	L	
					GYDLUS32P90F-M25R	L	
					GYDLUS32T90F-M25R	L	
				Metric	GYDL40M90D-M25R	L	F180
					GYDL40T90D-M25R	L	
					GYDL50P90F-M25R	L	
					GYDL50T90F-M25R	L	

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
E	GYM25LA-E12	External	00°	Inch	GYHLUS12C00-M25L	L	F042
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F188
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F066
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F054
					C4-GYHRD90-M25L	R	F198
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F078
		Internal	90°	Inch	GYDRUS24M90D-M25L	R	F172
					GYDRUS24T90D-M25L	R	
					GYDRUS32P90F-M25L	R	
					GYDRUS32T90F-M25L	R	
				Metric	GYDR40M90D-M25L	R	F180
					GYDR40T90D-M25L	R	
					GYDR50P90F-M25L	R	
					GYDR50T90F-M25L	R	
	GYM25RA-E20	External	00°	Inch	GYHRUS12C00-M25R	R	F042
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F188
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F066
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F054
					C4-GYHLD90-M25R	L	F198
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F078
	GYM25LA-E20	External	00°	Inch	GYHLUS12C00-M25L	L	F042
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F188
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F066
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F054
					C4-GYHRD90-M25L	R	F198
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F078

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
F	GYM20RA-F06	External	00°	Inch	GYHRUS10B00-M20R	R	F044
					GYHRUS12C00-M20R	R	
					C3-GYHRDX00-M20R	R	F190
				Metric	GYHR1616J00-M20R	R	F068
					GYHR2020K00-M20R	R	
			90°	Inch	GYHLUS12C90-M20R	L	F056
					C3-GYHLCX90-M20R	L	F200
				Metric	GYHL2020K90-M20R	L	F080
	GYM20LA-F06	External	00°	Inch	GYHLUS10B00-M20L	L	F044
					GYHLUS12C00-M20L	L	
					C3-GYHLDX00-M20L	L	F190
				Metric	GYHL1616J00-M20L	L	F068
					GYHL2020K00-M20L	L	
			90°	Inch	GYHRUS12C90-M20L	R	F056
					C3-GYHRCX90-M20L	R	F200
				Metric	GYHR2020K90-M20L	R	F080
	GYM20RA-F10	External	00°	Inch	GYHRUS10B00-M20R	R	F044
					GYHRUS12C00-M20R	R	
					C3-GYHRDX00-M20R	R	F190
				Metric	GYHR1616J00-M20R	R	F068
					GYHR2020K00-M20R	R	
			90°	Inch	GYHLUS12C90-M20R	L	F056
					C3-GYHLCX90-M20R	L	F200
				Metric	GYHL2020K90-M20R	L	F080
		Internal	90°	Inch	GYDLUS20L90C-M20R	L	F174
					GYDLUS20S90C-M20R	L	
					GYDLUS24M90D-M20R	L	
					GYDLUS24T90D-M20R	L	
				Metric	GYDL32L90C-M20R	L	F182
					GYDL32S90C-M20R	L	
					GYDL40M90D-M20R	L	
					GYDL40T90D-M20R	L	
	GYM20LA-F10	External	00°	Inch	GYHLUS10B00-M20L	L	F044
					GYHLUS12C00-M20L	L	
					C3-GYHLDX00-M20L	L	F190
				Metric	GYHL1616J00-M20L	L	F068
					GYHL2020K00-M20L	L	
			90°	Inch	GYHRUS12C90-M20L	R	F056
					C3-GYHRCX90-M20L	R	F200
				Metric	GYHR2020K90-M20L	R	F080
		Internal	90°	Inch	GYDRUS20L90C-M20L	R	F174
					GYDRUS20S90C-M20L	R	
					GYDRUS24M90D-M20L	R	
					GYDRUS24T90D-M20L	R	
				Metric	GYDR32L90C-M20L	R	F182
					GYDR32S90C-M20L	R	
					GYDR40M90D-M20L	R	
					GYDR40T90D-M20L	R	
	GYM20RB-F18	External	00°	Inch	GYHRUS10B00-M20R	R	F044
					GYHRUS12C00-M20R	R	
					C3-GYHRDX00-M20R	R	F190
				Metric	GYHR1616J00-M20R	R	F068
					GYHR2020K00-M20R	R	
			90°	Inch	GYHLUS12C90-M20R	L	F056
					C3-GYHLCX90-M20R	L	F200
				Metric	GYHL2020K90-M20R	L	F080
	GYM20LB-F18	External	00°	Inch	GYHLUS10B00-M20L	L	F044
					GYHLUS12C00-M20L	L	
					C3-GYHLDX00-M20L	L	F190
				Metric	GYHL1616J00-M20L	L	F068
					GYHL2020K00-M20L	L	
			90°	Inch	GYHRUS12C90-M20L	R	F056
					C3-GYHRCX90-M20L	R	F200
				Metric	GYHR2020K90-M20L	R	F080

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
F	GYM25RA-F06	External	00°	Inch	GYHRUS12C00-M25R	R	F044
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F190
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F068
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F056
					C4-GYHLD90-M25R	L	F200
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F080
	GYM25LA-F06	External	00°	Inch	GYHLUS12C00-M25L	L	F044
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F190
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F068
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F056
					C4-GYHRD90-M25L	R	F200
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F080
	GYM25RA-F12	External	00°	Inch	GYHRUS12C00-M25R	R	F044
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F190
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F068
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F056
					C4-GYHLD90-M25R	L	F200
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F080
		Internal	90°	Inch	GYDLUS24M90D-M25R	L	F174
					GYDLUS24T90D-M25R	L	
					GYDLUS32P90F-M25R	L	
					GYDLUS32T90F-M25R	L	
				Metric	GYDL40M90D-M25R	L	F182
					GYDL40T90D-M25R	L	
					GYDL50P90F-M25R	L	
					GYDL50T90F-M25R	L	

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Modular Blades Selection Chart (For External and Internal Grooving)

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
F	GYM25LA-F12	External	00°	Inch	GYHLUS12C00-M25L	L	F044
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F190
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F068
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F056
					C4-GYHRD90-M25L	R	F200
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F080
		Internal	90°	Inch	GYDRUS24M90D-M25L	R	F174
					GYDRUS24T90D-M25L	R	
					GYDRUS32P90F-M25L	R	
					GYDRUS32T90F-M25L	R	
				Metric	GYDR40M90D-M25L	R	F182
					GYDR40T90D-M25L	R	
					GYDR50P90F-M25L	R	
					GYDR50T90F-M25L	R	
	GYM25RA-F20	External	00°	Inch	GYHRUS12C00-M25R	R	F044
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F190
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F068
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F056
					C4-GYHLD90-M25R	L	F200
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F080
	GYM25LA-F20	External	00°	Inch	GYHLUS12C00-M25L	L	F044
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F190
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F068
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F056
					C4-GYHRD90-M25L	R	F200
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F080

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
G	GYM20RA-G12	External	00°	Inch	GYHRUS10B00-M20R	R	F046
					GYHRUS12C00-M20R	R	
					C3-GYHRDX00-M20R	R	F192
				Metric	GYHR1616J00-M20R	R	F070
					GYHR2020K00-M20R	R	
			90°	Inch	GYHLUS12C90-M20R	L	F056
					C3-GYHLCX90-M20R	L	F202
				Metric	GYHL2020K90-M20R	L	F080
		Internal	90°	Inch	GYDLUS20L90C-M20R	L	F174
					GYDLUS20S90C-M20R	L	
					GYDLUS24M90D-M20R	L	
					GYDLUS24T90D-M20R	L	
				Metric	GYDL32L90C-M20R	L	F182
					GYDL32S90C-M20R	L	
					GYDL40M90D-M20R	L	
					GYDL40T90D-M20R	L	
	GYM20LA-G12	External	00°	Inch	GYHLUS10B00-M20L	L	F046
					GYHLUS12C00-M20L	L	
					C3-GYHLDX00-M20L	L	F192
				Metric	GYHL1616J00-M20L	L	F070
					GYHL2020K00-M20L	L	
			90°	Inch	GYHRUS12C90-M20L	R	F056
					C3-GYHRCX90-M20L	R	F202
				Metric	GYHR2020K90-M20L	R	F080
		Internal	90°	Inch	GYDRUS20L90C-M20L	R	F174
					GYDRUS20S90C-M20L	R	
					GYDRUS24M90D-M20L	R	
					GYDRUS24T90D-M20L	R	
				Metric	GYDR32L90C-M20L	R	F182
					GYDR32S90C-M20L	R	
					GYDR40M90D-M20L	R	
					GYDR40T90D-M20L	R	
	GYM25RA-G08	External	00°	Inch	GYHRUS12C00-M25R	R	F046
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F192
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F070
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F056
					C4-GYHLD90-M25R	L	F202
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F080
	GYM25LA-G08	External	00°	Inch	GYHLUS12C00-M25L	L	F046
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F192
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F070
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F056
					C4-GYHRD90-M25L	R	F202
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F080

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
G	GYM25RA-G14	External	00°	Inch	GYHRUS12C00-M25R	R	F046
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F192
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F070
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F056
					C4-GYHLD90-M25R	L	F202
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F080
		Internal	90°	Inch	GYDLUS24M90D-M25R	L	F174
					GYDLUS24T90D-M25R	L	
					GYDLUS32P90F-M25R	L	
					GYDLUS32T90F-M25R	L	
				Metric	GYDL40M90D-M25R	L	F182
					GYDL40T90D-M25R	L	
					GYDL50P90F-M25R	L	
					GYDL50T90F-M25R	L	
	GYM25LA-G14	External	00°	Inch	GYHLUS12C00-M25L	L	F046
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F192
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F070
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F056
					C4-GYHRD90-M25L	R	F202
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F080
		Internal	90°	Inch	GYDRUS24M90D-M25L	R	F174
					GYDRUS24T90D-M25L	R	
					GYDRUS32P90F-M25L	R	
					GYDRUS32T90F-M25L	R	
				Metric	GYDR40M90D-M25L	R	F182
					GYDR40T90D-M25L	R	
					GYDR50P90F-M25L	R	
					GYDR50T90F-M25L	R	

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
G	GYM25RA-G25	External	00°	Inch	GYHRUS12C00-M25R	R	F046
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F192
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F070
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F056
					C4-GYHLD90-M25R	L	F202
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F080
	GYM25LA-G25	External	00°	Inch	GYHLUS12C00-M25L	L	F046
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F192
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F070
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F056
					C4-GYHRD90-M25L	R	F202
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F080

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Modular Blades Selection Chart (For External and Internal Grooving)

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
H	GYM20RA-H12	External	00°	Inch	GYHRUS10B00-M20R	R	F048
					GYHRUS12C00-M20R	R	
					C3-GYHRDX00-M20R	R	F194
				Metric	GYHR1616J00-M20R	R	F072
					GYHR2020K00-M20R	R	
			90°	Inch	GYHLUS12C90-M20R	L	F058
					C3-GYHLCX90-M20R	L	F204
				Metric	GYHL2020K90-M20R	L	F082
		Internal	90°	Inch	GYDLUS20L90C-M20R	L	F176
					GYDLUS20S90C-M20R	L	
					GYDLUS24M90D-M20R	L	
					GYDLUS24T90D-M20R	L	
				Metric	GYDL32L90C-M20R	L	F184
					GYDL32S90C-M20R	L	
					GYDL40M90D-M20R	L	
					GYDL40T90D-M20R	L	
	GYM20LA-H12	External	00°	Inch	GYHLUS10B00-M20L	L	F048
					GYHLUS12C00-M20L	L	
					C3-GYHLDX00-M20L	L	F194
				Metric	GYHL1616J00-M20L	L	F072
					GYHL2020K00-M20L	L	
			90°	Inch	GYHRUS12C90-M20L	R	F058
					C3-GYHRCX90-M20L	R	F204
				Metric	GYHR2020K90-M20L	R	F082
		Internal	90°	Inch	GYDRUS20L90C-M20L	R	F176
					GYDRUS20S90C-M20L	R	
					GYDRUS24M90D-M20L	R	
					GYDRUS24T90D-M20L	R	
				Metric	GYDR32L90C-M20L	R	F184
					GYDR32S90C-M20L	R	
					GYDR40M90D-M20L	R	
					GYDR40T90D-M20L	R	
	GYM25RA-H08	External	00°	Inch	GYHRUS12C00-M25R	R	F048
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F194
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F072
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F058
					C4-GYHLD90-M25R	L	F204
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F082
	GYM25LA-H08	External	00°	Inch	GYHLUS12C00-M25L	L	F048
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F194
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F072
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F058
					C4-GYHRD90-M25L	R	F204
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F082

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
H	GYM25RA-H14	External	00°	Inch	GYHRUS12C00-M25R	R	F048
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F194
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F072
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F058
					C4-GYHLD90-M25R	L	F204
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F082
		Internal	90°	Inch	GYDLUS24M90D-M25R	L	F176
					GYDLUS24T90D-M25R	L	
					GYDLUS32P90F-M25R	L	
					GYDLUS32T90F-M25R	L	
				Metric	GYDL40M90D-M25R	L	F184
					GYDL40T90D-M25R	L	
					GYDL50P90F-M25R	L	
					GYDL50T90F-M25R	L	
	GYM25LA-H14	External	00°	Inch	GYHLUS12C00-M25L	L	F048
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F194
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F072
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F058
					C4-GYHRD90-M25L	R	F204
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F082
		Internal	90°	Inch	GYDRUS24M90D-M25L	R	F176
					GYDRUS24T90D-M25L	R	
					GYDRUS32P90F-M25L	R	
					GYDRUS32T90F-M25L	R	
				Metric	GYDR40M90D-M25L	R	F184
					GYDR40T90D-M25L	R	
					GYDR50P90F-M25L	R	
					GYDR50T90F-M25L	R	

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
H	GYM25RA-H25	External	00°	Inch	GYHRUS12C00-M25R	R	F048
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F194
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F072
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F058
					C4-GYHLD90-M25R	L	F204
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F082
	GYM25LA-H25	External	00°	Inch	GYHLUS12C00-M25L	L	F048
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F194
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F072
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F058
					C4-GYHRD90-M25L	R	F204
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F082

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
J	GYM25RA-J08	External	00°	Inch	GYHRUS12C00-M25R	R	F050
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F194
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F074
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F058
					C4-GYHLD90-M25R	L	F204
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F082
	GYM25LA-J08	External	00°	Inch	GYHLUS12C00-M25L	L	F050
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F194
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F074
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F058
					C4-GYHRD90-M25L	R	F204
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F082
	GYM25RA-J14	External	00°	Inch	GYHRUS12C00-M25R	R	F050
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F194
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F074
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F058
					C4-GYHLD90-M25R	L	F204
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F082
		Internal	90°	Inch	GYDLUS24M90D-M25R	L	F176
					GYDLUS24T90D-M25R	L	
					GYDLUS32P90F-M25R	L	
					GYDLUS32T90F-M25R	L	
				Metric	GYDL40M90D-M25R	L	F184
					GYDL40T90D-M25R	L	
					GYDL50P90F-M25R	L	
					GYDL50T90F-M25R	L	

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Modular Blades Selection Chart (For External and Internal Grooving)

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
J	GYM25LA-J14	External	00°	Inch	GYHLUS12C00-M25L	L	F050
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F194
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F074
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F058
					C4-GYHRD90-M25L	R	F204
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F082
		Internal	90°	Inch	GYDRUS24M90D-M25L	R	F176
					GYDRUS24T90D-M25L	R	
					GYDRUS32P90F-M25L	R	
					GYDRUS32T90F-M25L	R	
				Metric	GYDR40M90D-M25L	R	F184
					GYDR40T90D-M25L	R	
					GYDR50P90F-M25L	R	
					GYDR50T90F-M25L	R	
	GYM25RA-J25	External	00°	Inch	GYHRUS12C00-M25R	R	F050
					GYHRUS16D00-M25R	R	
					GYHRUS20D00-M25R	R	
					GYHRUS24E00-M25R	R	
					C4-GYHREX00-M25R	R	F194
					C5-GYHREX00-M25R	R	
					C6-GYHRF00-M25R	R	
				Metric	GYHR2020K00-M25R	R	F074
					GYHR2525M00-M25R	R	
					GYHR3225P00-M25R	R	
					GYHR3232P00-M25R	R	
			90°	Inch	GYHLUS16D90-M25R	L	F058
					C4-GYHLD90-M25R	L	F204
					C5-GYHLD90-M25R	L	
					C6-GYHLE90-M25R	L	
				Metric	GYHL2525M90-M25R	L	F082

Seat Size	Modular Blade	Type	Angle	Inch or Metric	Holder	Hand of Holder	Page
J	GYM25LA-J25	External	00°	Inch	GYHLUS12C00-M25L	L	F050
					GYHLUS16D00-M25L	L	
					GYHLUS20D00-M25L	L	
					GYHLUS24E00-M25L	L	
					C4-GYHLEX00-M25L	L	F194
					C5-GYHLEX00-M25L	L	
					C6-GYHLF00-M25L	L	
				Metric	GYHL2020K00-M25L	L	F074
					GYHL2525M00-M25L	L	
					GYHL3225P00-M25L	L	
					GYHL3232P00-M25L	L	
			90°	Inch	GYHRUS16D90-M25L	R	F058
					C4-GYHRD90-M25L	R	F204
					C5-GYHRD90-M25L	R	
					C6-GYHRE90-M25L	R	
				Metric	GYHR2525M90-M25L	R	F082

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Modular Blades Selection Chart (For External and Face Grooving)

Holder	Angle of holder	Seat Size	Modular Blade	Type	Page
(Inch holder) **GYHRUS10B00-M20R** (Metric holder) **GYHR1616J00-M20R**	00°	D	GYM20RA-D06	External	F040
			GYM20RA-D10		F064
			GYM20RB-D18		
		E	GYM20RA-E06		F042
			GYM20RA-E10		F066
			GYM20RB-E18		
		F	GYM20RA-F06		F044
			GYM20RA-F10		F068
			GYM20RB-F18		
		G	GYM20RA-G12		F046, F070
		H	GYM20RA-H12		F048, F072
(Inch holder) **GYHLUS10B00-M20L** (Metric holder) **GYHL1616J00-M20L**	00°	D	GYM20LA-D06	External	F040
			GYM20LA-D10		F064
			GYM20LB-D18		
		E	GYM20LA-E06		F042
			GYM20LA-E10		F066
			GYM20LB-E18		
		F	GYM20LA-F06		F044
			GYM20LA-F10		F068
			GYM20LB-F18		
		G	GYM20LA-G12		F046, F070
		H	GYM20LA-H12		F048, F072
(Inch holder) **GYHRUS12C00-M20R** (Metric holder) **GYHR2020K00-M20R**	00°	D	GYM20RA-D06	External	F040
			GYM20RA-D10		F064
			GYM20RB-D18		
		E	GYM20RA-E06		F042
			GYM20RA-E10		F066
			GYM20RB-E18		
		F	GYM20RA-F06		F044
			GYM20RA-F10		F068
			GYM20RB-F18		
		G	GYM20RA-G12		F046, F070
		H	GYM20RA-H12		F048, F072
(Inch holder) **GYHLUS12C00-M20L** (Metric holder) **GYHL2020K00-M20L**	00°	D	GYM20LA-D06	External	F040
			GYM20LA-D10		F064
			GYM20LB-D18		
		E	GYM20LA-E06		F042
			GYM20LA-E10		F066
			GYM20LB-E18		
		F	GYM20LA-F06		F044
			GYM20LA-F10		F068
			GYM20LB-F18		
		G	GYM20LA-G12		F046, F070
		H	GYM20LA-H12		F048, F072
(Inch holder) **GYHRUS12C00-M25R** (Metric holder) **GYHR2020K00-M25R**	00°	D	GYM25RA-D06	External	F040
			GYM25RA-D12		F064
			GYM25RA-D20		
		E	GYM25RA-E06		F042
			GYM25RA-E12		F066
			GYM25RA-E20		
		F	GYM25RA-F06		F044
			GYM25RA-F12		F068
			GYM25RA-F20		
		G	GYM25RA-G08		F046
			GYM25RA-G14		F070
			GYM25RA-G25		
		H	GYM25RA-H08		F048
			GYM25RA-H14		F072
			GYM25RA-H25		
		J	GYM25RA-J08		F050
			GYM25RA-J14		F074
			GYM25RA-J25		

Holder	Angle of holder	Seat Size	Modular Blade	Type	Page
(Inch holder) **GYHRUS12C00-M25R** (Metric holder) **GYHR2020K00-M25R**	00°	D	GYM25RD-D12-040	Face	F086
			GYM25RD-D12-050		F128
			GYM25RD-D12-060		
			GYM25RD-D12-075		F088
			GYM25RD-D12-100		F130
			GYM25RD-D12-135		
			GYM25RD-D12-180		
		E	GYM25RD-E12-040		F090
			GYM25RD-E12-050		F132
			GYM25RD-E12-060		
			GYM25RD-E12-075		F092
			GYM25RD-E12-100		F134
			GYM25RD-E12-135		
			GYM25RD-E12-180		
		F	GYM25RD-F12-035		F094
			GYM25RD-F12-040		F136
			GYM25RD-F12-050		
			GYM25RD-F12-060		F096
			GYM25RD-F12-075		F138
			GYM25RD-F12-100		F098
			GYM25RD-F12-135		F140
			GYM25RD-F12-180		F100
			GYM25RD-F12-225		F142
			GYM25RD-F20-060		F096
			GYM25RD-F20-075		F138
			GYM25RD-F20-100		F098
			GYM25RD-F20-135		F140
			GYM25RD-F20-180		F100
			GYM25RD-F20-225		F142
		G	GYM25RD-G14-040		F102
			GYM25RD-G14-050		F144
			GYM25RD-G14-060		
			GYM25RD-G14-085		F104
			GYM25RD-G14-125		F146
			GYM25RD-G14-180		F106
			GYM25RD-G14-250		F148
			GYM25RD-G25-060		F102, F144
			GYM25RD-G25-085		F104
			GYM25RD-G25-125		F146
			GYM25RD-G25-180		F106
			GYM25RD-G25-250		F148
		H	GYM25RD-H14-050		F108
			GYM25RD-H14-060		F150
			GYM25RD-H14-085		F110
			GYM25RD-H14-125		F152
			GYM25RD-H14-180		F112
			GYM25RD-H14-250		F154
			GYM25RD-H25-060		F108, F150
			GYM25RD-H25-085		F110
			GYM25RD-H25-125		F152
			GYM25RD-H25-180		F112
			GYM25RD-H25-250		F154
		J	GYM25RD-J14-050		F114
			GYM25RD-J14-070		F156
			GYM25RD-J14-110		
			GYM25RD-J14-170		F116
			GYM25RD-J14-250		F158
			GYM25RD-J25-070		F114
			GYM25RD-J25-110		F158
			GYM25RD-J25-170		F116
			GYM25RD-J25-250		F158

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Modular Blades Selection Chart (For External and Face Grooving)

Holder	Angle of holder	Seat Size	Modular Blade	Type	Page
(Inch holder) GYHLUS12C00-M25L (Metric holder) GYHL2020K00-M25L	00°	D	GYM25LA-D06	External	F040
			GYM25LA-D12		F064
			GYM25LA-D20		
		E	GYM25LA-E06		F042
			GYM25LA-E12		F066
			GYM25LA-E20		
		F	GYM25LA-F06		F044
			GYM25LA-F12		F068
			GYM25LA-F20		
		G	GYM25LA-G08		F046
			GYM25LA-G14		F070
			GYM25LA-G25		
		H	GYM25LA-H08		F048
			GYM25LA-H14		F072
			GYM25LA-H25		
		J	GYM25LA-J08		F050
			GYM25LA-J14		F074
			GYM25LA-J25		
	00°	D	GYM25LD-D12-040	Face	F086
			GYM25LD-D12-050		F128
			GYM25LD-D12-060		
			GYM25LD-D12-075		F088
			GYM25LD-D12-100		F130
			GYM25LD-D12-135		
			GYM25LD-D12-180		
		E	GYM25LD-E12-040	Face	F090
			GYM25LD-E12-050		F132
			GYM25LD-E12-060		
			GYM25LD-E12-075		F092
			GYM25LD-E12-100		F134
			GYM25LD-E12-135		
			GYM25LD-E12-180		
		F	GYM25LD-F12-035	Face	F094
			GYM25LD-F12-040		F136
			GYM25LD-F12-050		F096
			GYM25LD-F12-060		F138
			GYM25LD-F12-075		F098
			GYM25LD-F12-100		F140
			GYM25LD-F12-135		F100
			GYM25LD-F12-180		F142
			GYM25LD-F12-225		
			GYM25LD-F20-060		F096
			GYM25LD-F20-075		F138
			GYM25LD-F20-100		F098
			GYM25LD-F20-135		F140
			GYM25LD-F20-180		F100
			GYM25LD-F20-225		F142
		G	GYM25LD-G14-040	Face	F102
			GYM25LD-G14-050		F144
			GYM25LD-G14-060		
			GYM25LD-G14-085		F104
			GYM25LD-G14-125		F146
			GYM25LD-G14-180		F106
			GYM25LD-G14-250		F148
			GYM25LD-G25-060		F102, F144
			GYM25LD-G25-085		F104
			GYM25LD-G25-125		F146
			GYM25LD-G25-180		F106
			GYM25LD-G25-250		F148

Holder	Angle of holder	Seat Size	Modular Blade	Type	Page
(Inch holder) GYHLUS12C00-M25L (Metric holder) GYHL2020K00-M25L	00°	H	GYM25LD-H14-050	Face	F108
			GYM25LD-H14-060		F150
			GYM25LD-H14-085		F110
			GYM25LD-H14-125		F152
			GYM25LD-H14-180		F112
			GYM25LD-H14-250		F154
			GYM25LD-H25-060		F108, F150
			GYM25LD-H25-085		F110
			GYM25LD-H25-125		F152
			GYM25LD-H25-180		F112
			GYM25LD-H25-250		F154
		J	GYM25LD-J14-050	Face	F114
			GYM25LD-J14-070		F156
			GYM25LD-J14-110		
			GYM25LD-J14-170		F116
			GYM25LD-J14-250		F158
			GYM25LD-J25-070		F114
			GYM25LD-J25-110		F156
			GYM25LD-J25-170		F116
			GYM25LD-J25-250		F158
(Inch holder) GYHRUS12C50-M20L (Metric holder) GYHR2020K50-M20L	50°	D	GYM20LC-D005	Recessing	F060, F084
		E	GYM20LC-E005		F060, F084
		F	GYM20LC-F005		F060, F084
		G	GYM20LC-G005		F060, F084
		H	GYM20LC-H005		F060, F084
(Inch holder) GYHLUS12C50-M20R (Metric holder) GYHL2020K50-M20R	50°	D	GYM20RC-D005	Recessing	F060, F084
		E	GYM20RC-E005		F060, F084
		F	GYM20RC-F005		F060, F084
		G	GYM20RC-G005		F060, F084
		H	GYM20RC-H005		F060, F084
(Inch holder) GYHRUS12C90-M20L (Metric holder) GYHR2020K90-M20L	90°	D	GYM20LA-D06	External	F054
			GYM20LA-D10		F078
			GYM20LB-D18		
		E	GYM20LA-E06		F054
			GYM20LA-E10		F078
			GYM20LB-E18		
		F	GYM20LA-F06		F056
			GYM20LA-F10		F080
			GYM20LB-F18		
		G	GYM20LA-G12		F056, F080
		H	GYM20LA-H12		F058, F082
(Inch holder) GYHLUS12C90-M20R (Metric holder) GYHL2020K90-M20R	90°	D	GYM20RA-D06	External	F054
			GYM20RA-D10		F078
			GYM20RB-D18		
		E	GYM20RA-E06		F054
			GYM20RA-E10		F078
			GYM20RB-E18		
		F	GYM20RA-F06		F056
			GYM20RA-F10		F080
			GYM20RB-F18		
		G	GYM20RA-G12		F056, F080
		H	GYM20RA-H12		F058, F082
(Inch holder) GYHRUS16D00-M25R (Metric holder) GYHR2525M00-M25R	00°	D	GYM25RA-D06	External	F040
			GYM25RA-D12		F064
			GYM25RA-D20		
		E	GYM25RA-E06	External	F042
			GYM25RA-E12		F066
			GYM25RA-E20		
		F	GYM25RA-F06	External	F044
			GYM25RA-F12		F068
			GYM25RA-F20		

Holder	Angle of holder	Seat Size	Modular Blade	Type	Page
(Inch holder) **GYHRUS16D00-M25R** (Metric holder) **GYHR2525M00-M25R**	00°	G	GYM25RA-G08	External	F046 F070
			GYM25RA-G14		
			GYM25RA-G25		
		H	GYM25RA-H08	External	F048 F072
			GYM25RA-H14		
			GYM25RA-H25		
		J	GYM25RA-J08	External	F050 F074
			GYM25RA-J14		
			GYM25RA-J25		
	00°	D	GYM25RD-D12-040	Face	F086 F128
			GYM25RD-D12-050		
			GYM25RD-D12-060		
			GYM25RD-D12-075		
			GYM25RD-D12-100		F088 F130
			GYM25RD-D12-135		
			GYM25RD-D12-180		
		E	GYM25RD-E12-040	Face	F090 F132
			GYM25RD-E12-050		
			GYM25RD-E12-060		
			GYM25RD-E12-075		
			GYM25RD-E12-100		F092 F134
			GYM25RD-E12-135		
			GYM25RD-E12-180		
		F	GYM25RD-F12-035	Face	F094 F136
			GYM25RD-F12-040		
			GYM25RD-F12-050		
			GYM25RD-F12-060		F096 F138
			GYM25RD-F12-075		
			GYM25RD-F12-100		F098 F140
			GYM25RD-F12-135		
			GYM25RD-F12-180		F100 F196
			GYM25RD-F12-225		
			GYM25RD-F20-060		F096 F138
			GYM25RD-F20-075		
			GYM25RD-F20-100		F098 F140
			GYM25RD-F20-135		
			GYM25RD-F20-180		F100 F142
			GYM25RD-F20-225		
		G	GYM25RD-G14-040	Face	F102 F144
			GYM25RD-G14-050		
			GYM25RD-G14-060		F104 F146
			GYM25RD-G14-085		
			GYM25RD-G14-125		F106 F148
			GYM25RD-G14-180		
			GYM25RD-G14-250		F102, F144
			GYM25RD-G25-060		F104 F146
			GYM25RD-G25-085		
			GYM25RD-G25-125		F106 F148
			GYM25RD-G25-180		
			GYM25RD-G25-250		
		H	GYM25RD-H14-050	Face	F108 F150
			GYM25RD-H14-060		
			GYM25RD-H14-085		F110 F152
			GYM25RD-H14-125		
			GYM25RD-H14-180		F112 F154
			GYM25RD-H14-250		
			GYM25RD-H25-060		F108, F150
			GYM25RD-H25-085		F110 F152
			GYM25RD-H25-125		
			GYM25RD-H25-180		F112 F154
			GYM25RD-H25-250		

Holder	Angle of holder	Seat Size	Modular Blade	Type	Page
(Inch holder) **GYHRUS16D00-M25R** (Metric holder) **GYHR2525M00-M25R**	00°	J	GYM25RD-J14-050	Face	F114 F156
			GYM25RD-J14-070		
			GYM25RD-J14-110		F116 F158
			GYM25RD-J14-170		
			GYM25RD-J14-250		F114 F156
			GYM25RD-J25-070		
			GYM25RD-J25-110		F116 F158
			GYM25RD-J25-170		
			GYM25RD-J25-250		
(Inch holder) **GYHLUS16D00-M25L** (Metric holder) **GYHL2525M00-M25L**	00°	D	GYM25LA-D06	External	F040 F064
			GYM25LA-D12		
			GYM25LA-D20		
		E	GYM25LA-E06	External	F042 F066
			GYM25LA-E12		
			GYM25LA-E20		
		F	GYM25LA-F06	External	F044 F068
			GYM25LA-F12		
			GYM25LA-F20		
		G	GYM25LA-G08	External	F046 F070
			GYM25LA-G14		
			GYM25LA-G25		
		H	GYM25LA-H08	External	F048 F072
			GYM25LA-H14		
			GYM25LA-H25		
		J	GYM25LA-J08	External	F050 F074
			GYM25LA-J14		
			GYM25LA-J25		
		D	GYM25LD-D12-040	Face	F086 F128
			GYM25LD-D12-050		
			GYM25LD-D12-060		
			GYM25LD-D12-075		
			GYM25LD-D12-100		F088 F130
			GYM25LD-D12-135		
			GYM25LD-D12-180		
		E	GYM25LD-E12-040	Face	F090 F132
			GYM25LD-E12-050		
			GYM25LD-E12-060		
			GYM25LD-E12-075		
			GYM25LD-E12-100		F092 F134
			GYM25LD-E12-135		
			GYM25LD-E12-180		
		F	GYM25LD-F12-035	Face	F094 F136
			GYM25LD-F12-040		
			GYM25LD-F12-050		
			GYM25LD-F12-060		F096 F138
			GYM25LD-F12-075		
			GYM25LD-F12-100		F098 F140
			GYM25LD-F12-135		
			GYM25LD-F12-180		F100 F142
			GYM25LD-F12-225		
			GYM25LD-F20-060		F096 F138
			GYM25LD-F20-075		
			GYM25LD-F20-100		F098 F140
			GYM25LD-F20-135		
			GYM25LD-F20-180		F100 F142
			GYM25LD-F20-225		

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Modular Blades Selection Chart (For External and Face Grooving)

Holder	Angle of holder	Seat Size	Modular Blade	Type	Page
(Inch holder) **GYHLUS16D00-M25L** (Metric holder) **GYHL2525M00-M25L**	00°	G	GYM25LD-G14-040	Face	F102 F144
			GYM25LD-G14-050		
			GYM25LD-G14-060		
			GYM25LD-G14-085		F104 F146
			GYM25LD-G14-125		
			GYM25LD-G14-180		F106 F148
			GYM25LD-G14-250		
			GYM25LD-G25-060		F102, F144
			GYM25LD-G25-085		F104 F146
			GYM25LD-G25-125		
			GYM25LD-G25-180		F106 F148
			GYM25LD-G25-250		
		H	GYM25LD-H14-050	Face	F108 F150
			GYM25LD-H14-060		
			GYM25LD-H14-085		F110 F152
			GYM25LD-H14-125		
			GYM25LD-H14-180		F112 F154
			GYM25LD-H14-250		
			GYM25LD-H25-060		F108, F150
			GYM25LD-H25-085		F110 F152
			GYM25LD-H25-125		
			GYM25LD-H25-180		F112 F154
			GYM25LD-H25-250		
		J	GYM25LD-J14-050	Face	F114 F156
			GYM25LD-J14-070		
			GYM25LD-J14-110		F116 F158
			GYM25LD-J14-170		
			GYM25LD-J14-250		
			GYM25LD-J25-070		F114 F156
			GYM25LD-J25-110		
			GYM25LD-J25-170		F116 F158
			GYM25LD-J25-250		
(Inch holder) **GYHRUS16D50-M25L** (Metric holder) **GYHR2525M50-M25L**	50°	D	GYM25LC-D005	Recessing	F060, F084
		E	GYM25LC-E005		F060, F084
		F	GYM25LC-F005		F060, F084
		G	GYM25LC-G005		F060, F084
		H	GYM25LC-H005		F060, F084
		J	GYM25LC-J005		F060, F084
(Inch holder) **GYHLUS16D50-M25R** (Metric holder) **GYHR2525M50-M25R**	50°	D	GYM25RC-D005	Recessing	F060, F084
		E	GYM25RC-E005		F060, F084
		F	GYM25RC-F005		F060, F084
		G	GYM25RC-G005		F060, F084
		H	GYM25RC-H005		F060, F084
		J	GYM25RC-J005		F060, F084
(Inch holder) **GYHRUS16D90-M25L** (Metric holder) **GYHR2525M90-M25L**	90°	D	GYM25LA-D06	External	F054 F078
			GYM25LA-D12		
			GYM25LA-D20		
		E	GYM25LA-E06	External	F054 F078
			GYM25LA-E12		
			GYM25LA-E20		
		F	GYM25LA-F06	External	F056 F080
			GYM25LA-F12		
			GYM25LA-F20		
		G	GYM25LA-G08	External	F056 F080
			GYM25LA-G14		
			GYM25LA-G25		
		H	GYM25LA-H08	External	F058 F082
			GYM25LA-H14		
			GYM25LA-H25		
		J	GYM25LA-J08	External	F058 F082
			GYM25LA-J14		
			GYM25LA-J25		

Holder	Angle of holder	Seat Size	Modular Blade	Type	Page
(Inch holder) **GYHRUS16D90-M25L** (Metric holder) **GYHR2525M90-M25L**	90°	D	GYM25LD-D12-040	Face	F118 F160
			GYM25LD-D12-050		
			GYM25LD-D12-060		
			GYM25LD-D12-075		
			GYM25LD-D12-100		
			GYM25LD-D12-135		
			GYM25LD-D12-180		
		E	GYM25LD-E12-040	Face	F118 F160
			GYM25LD-E12-050		
			GYM25LD-E12-060		
			GYM25LD-E12-075		
			GYM25LD-E12-100		
			GYM25LD-E12-135		
			GYM25LD-E12-180		
		F	GYM25LD-F12-035	Face	F120 F162
			GYM25LD-F12-040		
			GYM25LD-F12-050		
			GYM25LD-F12-060		
			GYM25LD-F12-075		
			GYM25LD-F12-100		
			GYM25LD-F12-135		
			GYM25LD-F12-180		
			GYM25LD-F12-225		
			GYM25LD-F20-060		
			GYM25LD-F20-075		
			GYM25LD-F20-100		
			GYM25LD-F20-135		
			GYM25LD-F20-180		
			GYM25LD-F20-225		
		G	GYM25LD-G14-040	Face	F122 F164
			GYM25LD-G14-050		
			GYM25LD-G14-060		
			GYM25LD-G14-085		
			GYM25LD-G14-125		
			GYM25LD-G14-180		
			GYM25LD-G14-250		
			GYM25LD-G25-060		
			GYM25LD-G25-085		
			GYM25LD-G25-125		
			GYM25LD-G25-180		
			GYM25LD-G25-250		
		H	GYM25LD-H14-050	Face	F124 F166
			GYM25LD-H14-060		
			GYM25LD-H14-085		
			GYM25LD-H14-125		
			GYM25LD-H14-180		
			GYM25LD-H14-250		
			GYM25LD-H25-060		
			GYM25LD-H25-085		
			GYM25LD-H25-125		
			GYM25LD-H25-180		
			GYM25LD-H25-250		
		J	GYM25LD-J14-050	Face	F126 F128
			GYM25LD-J14-070		
			GYM25LD-J14-110		
			GYM25LD-J14-170		
			GYM25LD-J14-250		
			GYM25LD-J25-070		
			GYM25LD-J25-110		
			GYM25LD-J25-170		
			GYM25LD-J25-250		

Holder	Angle of holder	Seat Size	Modular Blade	Type	Page
(Inch holder) **GYHLUS16D90-M25R** (Metric holder) **GYHL2525M90-M25R**	90°	D	GYM25RA-D06 GYM25RA-D12 GYM25RA-D20	External	F054 F078
		E	GYM25RA-E06 GYM25RA-E12 GYM25RA-E20	External	F054 F078
		F	GYM25RA-F06 GYM25RA-F12 GYM25RA-F20	External	F056 F080
		G	GYM25RA-G08 GYM25RA-G14 GYM25RA-G25	External	F056 F080
		H	GYM25RA-H08 GYM25RA-H14 GYM25RA-H25	External	F058 F082
		J	GYM25RA-J08 GYM25RA-J14 GYM25RA-J25	External	F058 F082
	90°	D	GYM25RD-D12-040 GYM25RD-D12-050 GYM25RD-D12-060 GYM25RD-D12-075 GYM25RD-D12-100 GYM25RD-D12-135 GYM25RD-D12-180	Face	F118 F160
		E	GYM25RD-E12-040 GYM25RD-E12-050 GYM25RD-E12-060 GYM25RD-E12-075 GYM25RD-E12-100 GYM25RD-E12-135 GYM25RD-E12-180	Face	F118 F160
		F	GYM25RD-F12-035 GYM25RD-F12-040 GYM25RD-F12-050 GYM25RD-F12-060 GYM25RD-F12-075 GYM25RD-F12-100 GYM25RD-F12-135 GYM25RD-F12-180 GYM25RD-F12-225 GYM25RD-F20-060 GYM25RD-F20-075 GYM25RD-F20-100 GYM25RD-F20-135 GYM25RD-F20-180 GYM25RD-F20-225	Face	F120 F162
		G	GYM25RD-G14-040 GYM25RD-G14-050 GYM25RD-G14-060 GYM25RD-G14-085 GYM25RD-G14-125 GYM25RD-G14-180 GYM25RD-G14-250 GYM25RD-G25-060 GYM25RD-G25-085 GYM25RD-G25-125 GYM25RD-G25-180 GYM25RD-G25-250	Face	F122 F164

Holder	Angle of holder	Seat Size	Modular Blade	Type	Page
(Inch holder) **GYHLUS16D90-M25R** (Metric holder) **GYHL2525M90-M25R**	90°	H	GYM25RD-H14-050 GYM25RD-H14-060 GYM25RD-H14-085 GYM25RD-H14-125 GYM25RD-H14-180 GYM25RD-H14-250 GYM25RD-H25-060 GYM25RD-H25-085 GYM25RD-H25-125 GYM25RD-H25-180 GYM25RD-H25-250	Face	F124 F166
		J	GYM25RD-J14-050 GYM25RD-J14-070 GYM25RD-J14-110 GYM25RD-J14-170 GYM25RD-J14-250 GYM25RD-J25-070 GYM25RD-J25-110 GYM25RD-J25-170 GYM25RD-J25-250	Face	F126 F168
(Inch holder) **GYHRUS20D00-M25R** (Metric holder) **GYHR3225P00-M25R**	00°	D	GYM25RA-D06 GYM25RA-D12 GYM25RA-D20	External	F040 F064
		E	GYM25RA-E06 GYM25RA-E12 GYM25RA-E20	External	F042 F066
		F	GYM25RA-F06 GYM25RA-F12 GYM25RA-F20	External	F044 F068
		G	GYM25RA-G08 GYM25RA-G14 GYM25RA-G25	External	F046 F070
		H	GYM25RA-H08 GYM25RA-H14 GYM25RA-H25	External	F048 F072
		J	GYM25RA-J08 GYM25RA-J14 GYM25RA-J25	External	F050 F074
	00°	D	GYM25RD-D12-040 GYM25RD-D12-050 GYM25RD-D12-060 GYM25RD-D12-075 GYM25RD-D12-100 GYM25RD-D12-135 GYM25RD-D12-180	Face	F086 F128 F088 F130
		E	GYM25RD-E12-040 GYM25RD-E12-050 GYM25RD-E12-060 GYM25RD-E12-075 GYM25RD-E12-100 GYM25RD-E12-135 GYM25RD-E12-180	Face	F090 F132 F092 F134

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Modular Blades Selection Chart (For External and Face Grooving)

Holder	Angle of holder	Seat Size	Modular Blade	Type	Page
(Inch holder) **GYHRUS20D00-M25R** (Metric holder) **GYHR3225P00-M25R**	00°	F	GYM25RD-F12-035	Face	F094 F136
			GYM25RD-F12-040		
			GYM25RD-F12-050		F096 F138
			GYM25RD-F12-060		
			GYM25RD-F12-075		F098 F140
			GYM25RD-F12-100		
			GYM25RD-F12-135		F100 F142
			GYM25RD-F12-180		
			GYM25RD-F12-225		F096 F138
			GYM25RD-F20-060		
			GYM25RD-F20-075		F098 F140
			GYM25RD-F20-100		
			GYM25RD-F20-135		F100 F142
			GYM25RD-F20-180		
			GYM25RD-F20-225		
		G	GYM25RD-G14-040		F102 F144
			GYM25RD-G14-050		
			GYM25RD-G14-060		F104 F146
			GYM25RD-G14-085		
			GYM25RD-G14-125		F106 F148
			GYM25RD-G14-180		
			GYM25RD-G14-250		F102, F144
			GYM25RD-G25-060		F104 F146
			GYM25RD-G25-085		
			GYM25RD-G25-125		F106 F148
			GYM25RD-G25-180		
			GYM25RD-G25-250		
		H	GYM25RD-H14-050		F108 F150
			GYM25RD-H14-060		
			GYM25RD-H14-085		F110 F152
			GYM25RD-H14-125		
			GYM25RD-H14-180		F112 F154
			GYM25RD-H14-250		
			GYM25RD-H25-060		F108, F150
			GYM25RD-H25-085		F110 F152
			GYM25RD-H25-125		
			GYM25RD-H25-180		F112 F154
			GYM25RD-H25-250		
		J	GYM25RD-J14-050		F114 F156
			GYM25RD-J14-070		
			GYM25RD-J14-110		F116 F158
			GYM25RD-J14-170		
			GYM25RD-J14-250		F114 F156
			GYM25RD-J25-070		
			GYM25RD-J25-110		F116 F158
			GYM25RD-J25-170		
			GYM25RD-J25-250		
(Inch holder) **GYHLUS20D00-M25L** (Metric holder) **GYHL3225P00-M25L**	00°	D	GYM25LA-D06	External	F040 F064
			GYM25LA-D12		
			GYM25LA-D20		
		E	GYM25LA-E06	External	F042 F066
			GYM25LA-E12		
			GYM25LA-E20		
		F	GYM25LA-F06	External	F044 F068
			GYM25LA-F12		
			GYM25LA-F20		
		G	GYM25LA-G08	External	F046 F070
			GYM25LA-G14		
			GYM25LA-G25		
		H	GYM25LA-H08	External	F048 F072
			GYM25LA-H14		
			GYM25LA-H25		

Holder	Angle of holder	Seat Size	Modular Blade	Type	Page
(Inch holder) **GYHLUS20D00-M25L** (Metric holder) **GYHL3225P00-M25L**	00°	J	GYM25LA-J08	External	F050 F074
			GYM25LA-J14		
			GYM25LA-J25		
	00°	D	GYM25LD-D12-040	Face	F086 F128
			GYM25LD-D12-050		
			GYM25LD-D12-060		
			GYM25LD-D12-075		F088 F130
			GYM25LD-D12-100		
			GYM25LD-D12-135		
			GYM25LD-D12-180		
		E	GYM25LD-E12-040	Face	F090 F122
			GYM25LD-E12-050		
			GYM25LD-E12-060		
			GYM25LD-E12-075		F092 F134
			GYM25LD-E12-100		
			GYM25LD-E12-135		
			GYM25LD-E12-180		
		F	GYM25LD-F12-035	Face	F094 F136
			GYM25LD-F12-040		
			GYM25LD-F12-050		F096 F138
			GYM25LD-F12-060		
			GYM25LD-F12-075		F098 F140
			GYM25LD-F12-100		
			GYM25LD-F12-135		F100 F142
			GYM25LD-F12-180		
			GYM25LD-F12-225		
			GYM25LD-F20-060		F096 F138
			GYM25LD-F20-075		
			GYM25LD-F20-100		F098 F140
			GYM25LD-F20-135		
			GYM25LD-F20-180		F100 F142
			GYM25LD-F20-225		
		G	GYM25LD-G14-040	Face	F102 F144
			GYM25LD-G14-050		
			GYM25LD-G14-060		F104 F146
			GYM25LD-G14-085		
			GYM25LD-G14-125		F106 F148
			GYM25LD-G14-180		
			GYM25LD-G14-250		F102, F144
			GYM25LD-G25-060		F104 F146
			GYM25LD-G25-085		
			GYM25LD-G25-125		F106 F148
			GYM25LD-G25-180		
			GYM25LD-G25-250		
		H	GYM25LD-H14-050	Face	F108 F150
			GYM25LD-H14-060		
			GYM25LD-H14-085		F110 F152
			GYM25LD-H14-125		
			GYM25LD-H14-180		F112 F154
			GYM25LD-H14-250		
			GYM25LD-H25-060		F108, F150
			GYM25LD-H25-085		F110 F152
			GYM25LD-H25-125		
			GYM25LD-H25-180		F112 F154
			GYM25LD-H25-250		

Holder	Angle of holder	Seat Size	Modular Blade	Type	Page
(Inch holder) **GYHLUS20D00-M25L** (Metric holder) **GYHL3225P00-M25L**	00°	J	GYM25LD-J14-050 GYM25LD-J14-070 GYM25LD-J14-110	Face	F114 F156
			GYM25LD-J14-170 GYM25LD-J14-250		F116 F158
			GYM25LD-J25-070 GYM25LD-J25-110		F114 F156
			GYM25LD-J25-170 GYM25LD-J25-250		F116 F158
(Inch holder) **GYHRUS24E00-M25R** (Metric holder) **GYHR3232P00-M25R**	00°	D	GYM25RA-D06 GYM25RA-D12 GYM25RA-D20	External	F040 F064
		E	GYM25RA-E06 GYM25RA-E12 GYM25RA-E20	External	F042 F066
		F	GYM25RA-F06 GYM25RA-F12 GYM25RA-F20	External	F044 F068
		G	GYM25RA-G08 GYM25RA-G14 GYM25RA-G25	External	F046 F070
		H	GYM25RA-H08 GYM25RA-H14 GYM25RA-H25	External	F048 F072
		J	GYM25RA-J08 GYM25RA-J14 GYM25RA-J25	External	F050 F074
	00°	D	GYM25RD-D12-040 GYM25RD-D12-050 GYM25RD-D12-060 GYM25RD-D12-075	Face	F086 F128
			GYM25RD-D12-100 GYM25RD-D12-135 GYM25RD-D12-180		F088 F130
		E	GYM25RD-E12-040 GYM25RD-E12-050 GYM25RD-E12-060 GYM25RD-E12-075	Face	F090 F132
			GYM25RD-E12-100 GYM25RD-E12-135 GYM25RD-E12-180		F092 F134
		F	GYM25RD-F12-035 GYM25RD-F12-040 GYM25RD-F12-050	Face	F094 F136
			GYM25RD-F12-060 GYM25RD-F12-075		F096 F138
			GYM25RD-F12-100 GYM25RD-F12-135		F098 F140
			GYM25RD-F12-180 GYM25RD-F12-225		F100 F142
			GYM25RD-F20-060 GYM25RD-F20-075		F096 F138
			GYM25RD-F20-100 GYM25RD-F20-135		F098 F140
			GYM25RD-F20-180 GYM25RD-F20-225		F100 F142

Holder	Angle of holder	Seat Size	Modular Blade	Type	Page
(Inch holder) **GYHRUS24E00-M25R** (Metric holder) **GYHR3232P00-M25R**	00°	G	GYM25RD-G14-040 GYM25RD-G14-050 GYM25RD-G14-060	Face	F102 F144
			GYM25RD-G14-085 GYM25RD-G14-125		F104 F146
			GYM25RD-G14-180 GYM25RD-G14-250		F106 F148
			GYM25RD-G25-060		F102, F144
			GYM25RD-G25-085 GYM25RD-G25-125		F104 F146
			GYM25RD-G25-180 GYM25RD-G25-250		F106 F148
		H	GYM25RD-H14-050 GYM25RD-H14-060	Face	F108 F150
			GYM25RD-H14-085 GYM25RD-H14-125		F110 F152
			GYM25RD-H14-180 GYM25RD-H14-250		F112 F154
			GYM25RD-H25-060		F108, F150
			GYM25RD-H25-085 GYM25RD-H25-125		F110 F152
			GYM25RD-H25-180 GYM25RD-H25-250		F112 F154
		J	GYM25RD-J14-050 GYM25RD-J14-070 GYM25RD-J14-110	Face	F114 F156
			GYM25RD-J14-170 GYM25RD-J14-250		F116 F158
			GYM25RD-J25-070 GYM25RD-J25-110		F114 F156
			GYM25RD-J25-170 GYM25RD-J25-250		F116 F158
(Inch holder) **GYHLUS24E00-M25L** (Metric holder) **GYHL3232P00-M25L**	00°	D	GYM25LA-D06 GYM25LA-D12 GYM25LA-D20	External	F040 F064
		E	GYM25LA-E06 GYM25LA-E12 GYM25LA-E20	External	F042 F066
		F	GYM25LA-F06 GYM25LA-F12 GYM25LA-F20	External	F044 F068
		G	GYM25LA-G08 GYM25LA-G14 GYM25LA-G25	External	F046 F070
		H	GYM25LA-H08 GYM25LA-H14 GYM25LA-H25	External	F048 F072
		J	GYM25LA-J08 GYM25LA-J14 GYM25LA-J25	External	F050 F074
	00°	D	GYM25LD-D12-040 GYM25LD-D12-050 GYM25LD-D12-060 GYM25LD-D12-075	Face	F086 F128
			GYM25LD-D12-100 GYM25LD-D12-135 GYM25LD-D12-180		F088 F130

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Modular Blades Selection Chart (For External and Face Grooving)

Holder	Angle of holder	Seat Size	Modular Blade	Type	Page
(Inch holder) **GYHLUS24E00-M25L** (Metric holder) **GYHL3232P00-M25L**	00°	E	GYM25LD-E12-040	Face	F090 F132
			GYM25LD-E12-050		
			GYM25LD-E12-060		
			GYM25LD-E12-075		
			GYM25LD-E12-100		F092 F134
			GYM25LD-E12-135		
			GYM25LD-E12-180		
		F	GYM25LD-F12-035	Face	F094 F136
			GYM25LD-F12-040		
			GYM25LD-F12-050		
			GYM25LD-F12-060		F096 F138
			GYM25LD-F12-075		
			GYM25LD-F12-100		F098 F140
			GYM25LD-F12-135		
			GYM25LD-F12-180		F100 F142
			GYM25LD-F12-225		
			GYM25LD-F20-060		F096 F138
			GYM25LD-F20-075		
			GYM25LD-F20-100		F098 F140
			GYM25LD-F20-135		
			GYM25LD-F20-180		F100 F142
			GYM25LD-F20-225		

Holder	Angle of holder	Seat Size	Modular Blade	Type	Page
(Inch holder) **GYHLUS24E00-M25L** (Metric holder) **GYHL3232P00-M25L**	00°	G	GYM25LD-G14-040	Face	F102 F144
			GYM25LD-G14-050		
			GYM25LD-G14-060		
			GYM25LD-G14-085		F104 F146
			GYM25LD-G14-125		
			GYM25LD-G14-180		F106 F148
			GYM25LD-G14-250		
			GYM25LD-G25-060		F102, F144
			GYM25LD-G25-085		F104 F146
			GYM25LD-G25-125		
			GYM25LD-G25-180		F106 F148
			GYM25LD-G25-250		
		H	GYM25LD-H14-050	Face	F108 F150
			GYM25LD-H14-060		
			GYM25LD-H14-085		F110 F152
			GYM25LD-H14-125		
			GYM25LD-H14-180		F112 F154
			GYM25LD-H14-250		
			GYM25LD-H25-060		F108, F150
			GYM25LD-H25-085		F110 F152
			GYM25LD-H25-125		
			GYM25LD-H25-180		F112 F154
			GYM25LD-H25-250		
		J	GYM25LD-J14-050	Face	F114 F156
			GYM25LD-J14-070		
			GYM25LD-J14-110		
			GYM25LD-J14-170		F116 F158
			GYM25LD-J14-250		
			GYM25LD-J25-070		F114 F156
			GYM25LD-J25-110		
			GYM25LD-J25-170		F116 F158
			GYM25LD-J25-250		

Modular Blades Selection Chart
(For External Grooving GY-PSC Type)

GY-PSC Holder External	Angle	Seat Size	Modular Blade	Hand of Modular Blade	Page
C3-GYHRDX00-M20R	00°	D	GYM20RA-D06 GYM20RA-D10 GYM20RB-D18	R	F186
		E	GYM20RA-E06 GYM20RA-E10 GYM20RB-E18		F188
		F	GYM20RA-F06 GYM20RA-F10 GYM20RB-F18		F190
		G	GYM20RA-G12		F192
		H	GYM20RA-H12		F194
C3-GYHLDX00-M20L	00°	D	GYM20LA-D06 GYM20LA-D10 GYM20LB-D18	L	F186
		E	GYM20LA-E06 GYM20LA-E10 GYM20LB-E18		F188
		F	GYM20LA-F06 GYM20LA-F10 GYM20LB-F18		F190
		G	GYM20LA-G12		F192
		H	GYM20LA-H12		F194
C3-GYHRCX90-M20L	90°	D	GYM20LA-D06 GYM20LA-D10 GYM20LB-D18	L	F196
		E	GYM20LA-E06 GYM20LA-E10 GYM20LB-E18		F198
		F	GYM20LA-F06 GYM20LA-F10 GYM20LB-F18		F200
		G	GYM20LA-G12		F202
		H	GYM20LA-H12		F204
C3-GYHLCX90-M20R	90°	D	GYM20RA-D06 GYM20RA-D10 GYM20RB-D18	R	F196
		E	GYM20RA-E06 GYM20RA-E10 GYM20RB-E18		F198
		F	GYM20RA-F06 GYM20RA-F10 GYM20RB-F18		F200
		G	GYM20RA-G12		F202
		H	GYM20RA-H12		F204
C4-GYHREX00-M25R	00°	D	GYM25RA-D06 GYM25RA-D12 GYM25RA-D20	R	F186
		E	GYM25RA-E06 GYM25RA-E12 GYM25RA-E20		F188
		F	GYM25RA-F06 GYM25RA-F12 GYM25RA-F20		F190
		G	GYM25RA-G08 GYM25RA-G14 GYM25RA-G25		F192
		H	GYM25RA-H08 GYM25RA-H14 GYM25RA-H25		F194
		J	GYM25RA-J08 GYM25RA-J14 GYM25RA-J25		F194

GY-PSC Holder External	Angle	Seat Size	Modular Blade	Hand of Modular Blade	Page
C4-GYHLEX00-M25L	00°	D	GYM25LA-D06 GYM25LA-D12 GYM25LA-D20	L	F186
		E	GYM25LA-E06 GYM25LA-E12 GYM25LA-E20		F188
		F	GYM25LA-F06 GYM25LA-F12 GYM25LA-F20		F190
		G	GYM25LA-G08 GYM25LA-G14 GYM25LA-G25		F192
		H	GYM25LA-H08 GYM25LA-H14 GYM25LA-H25		F194
		J	GYM25LA-J08 GYM25LA-J14 GYM25LA-J25		F194
C4-GYHRD90-M25L	90°	D	GYM25LA-D06 GYM25LA-D12 GYM25LA-D20	L	F196
		E	GYM25LA-E06 GYM25LA-E12 GYM25LA-E20		F198
		F	GYM25LA-F06 GYM25LA-F12 GYM25LA-F20		F200
		G	GYM25LA-G08 GYM25LA-G14 GYM25LA-G25		F202
		H	GYM25LA-H08 GYM25LA-H14 GYM25LA-H25		F204
		J	GYM25LA-J08 GYM25LA-J14 GYM25LA-J25		F204
C4-GYHLD90-M25R	90°	D	GYM25RA-D06 GYM25RA-D12 GYM25RA-D20	R	F196
		E	GYM25RA-E06 GYM25RA-E12 GYM25RA-E20		F198
		F	GYM25RA-F06 GYM25RA-F12 GYM25RA-F20		F200
		G	GYM25RA-G08 GYM25RA-G14 GYM25RA-G25		F202
		H	GYM25RA-H08 GYM25RA-H14 GYM25RA-H25		F204
		J	GYM25RA-J08 GYM25RA-J14 GYM25RA-J25		F204

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Modular Blades Selection Chart (For External Grooving GY-PSC Type)

GY-PSC Holder External	Angle	Seat Size	Modular Blade	Hand of Modular Blade	Page
C5-GYHREX00-M25R	00°	D	GYM25RA-D06 GYM25RA-D12 GYM25RA-D20	R	F186
		E	GYM25RA-E06 GYM25RA-E12 GYM25RA-E20		F188
		F	GYM25RA-F06 GYM25RA-F12 GYM25RA-F20		F190
		G	GYM25RA-G08 GYM25RA-G14 GYM25RA-G25		F192
		H	GYM25RA-H08 GYM25RA-H14 GYM25RA-H25		F194
		J	GYM25RA-J08 GYM25RA-J14 GYM25RA-J25		F194
C5-GYHLEX00-M25L	00°	D	GYM25LA-D06 GYM25LA-D12 GYM25LA-D20	L	F186
		E	GYM25LA-E06 GYM25LA-E12 GYM25LA-E20		F188
		F	GYM25LA-F06 GYM25LA-F12 GYM25LA-F20		F190
		G	GYM25LA-G08 GYM25LA-G14 GYM25LA-G25		F192
		H	GYM25LA-H08 GYM25LA-H14 GYM25LA-H25		F194
		J	GYM25LA-J08 GYM25LA-J14 GYM25LA-J25		F194
C5-GYHRD90-M25L	90°	D	GYM25LA-D06 GYM25LA-D12 GYM25LA-D20	L	F196
		E	GYM25LA-E06 GYM25LA-E12 GYM25LA-E20		F198
		F	GYM25LA-F06 GYM25LA-F12 GYM25LA-F20		F200
		G	GYM25LA-G08 GYM25LA-G14 GYM25LA-G25		F202
		H	GYM25LA-H08 GYM25LA-H14 GYM25LA-H25		F204
		J	GYM25LA-J08 GYM25LA-J14 GYM25LA-J25		F204

GY-PSC Holder External	Angle	Seat Size	Modular Blade	Hand of Modular Blade	Page
C5-GYHLD90-M25R	90°	D	GYM25RA-D06 GYM25RA-D12 GYM25RA-D20	R	F196
		E	GYM25RA-E06 GYM25RA-E12 GYM25RA-E20		F198
		F	GYM25RA-F06 GYM25RA-F12 GYM25RA-F20		F200
		G	GYM25RA-G08 GYM25RA-G14 GYM25RA-G25		F202
		H	GYM25RA-H08 GYM25RA-H14 GYM25RA-H25		F204
		J	GYM25RA-J08 GYM25RA-J14 GYM25RA-J25		F204
C6-GYHRF00-M25R	00°	D	GYM25RA-D06 GYM25RA-D12 GYM25RA-D20	R	F186
		E	GYM25RA-E06 GYM25RA-E12 GYM25RA-E20		F188
		F	GYM25RA-F06 GYM25RA-F12 GYM25RA-F20		F190
		G	GYM25RA-G08 GYM25RA-G14 GYM25RA-G25		F192
		H	GYM25RA-H08 GYM25RA-H14 GYM25RA-H25		F194
		J	GYM25RA-J08 GYM25RA-J14 GYM25RA-J25		F194
C6-GYHLF00-M25L	00°	D	GYM25LA-D06 GYM25LA-D12 GYM25LA-D20	L	F186
		E	GYM25LA-E06 GYM25LA-E12 GYM25LA-E20		F188
		F	GYM25LA-F06 GYM25LA-F12 GYM25LA-F20		F190
		G	GYM25LA-G08 GYM25LA-G14 GYM25LA-G25		F192
		H	GYM25LA-H08 GYM25LA-H14 GYM25LA-H25		F194
		J	GYM25LA-J08 GYM25LA-J14 GYM25LA-J25		F194

GY-PSC Holder External	Angle	Seat Size	Modular Blade	Hand of Modular Blade	Page
C6-GYHRE90-M25L	90°	D	GYM25LA-D06 GYM25LA-D12 GYM25LA-D20	L	F196
		E	GYM25LA-E06 GYM25LA-E12 GYM25LA-E20		F198
		F	GYM25LA-F06 GYM25LA-F12 GYM25LA-F20		F200
		G	GYM25LA-G08 GYM25LA-G14 GYM25LA-G25		F202
		H	GYM25LA-H08 GYM25LA-H14 GYM25LA-H25		F204
		J	GYM25LA-J08 GYM25LA-J14 GYM25LA-J25		F204
C6-GYHLE90-M25R	90°	D	GYM25RA-D06 GYM25RA-D12 GYM25RA-D20	R	F196
		E	GYM25RA-E06 GYM25RA-E12 GYM25RA-E20		F198
		F	GYM25RA-F06 GYM25RA-F12 GYM25RA-F20		F200
		G	GYM25RA-G08 GYM25RA-G14 GYM25RA-G25		F202
		H	GYM25RA-H08 GYM25RA-H14 GYM25RA-H25		F204
		J	GYM25RA-J08 GYM25RA-J14 GYM25RA-J25		F204

QUICK INDEX

Modular Blades Selection Chart (For Internal Grooving)

Internal Holder	Inch or Metric	Angle	Seat Size	Modular Blade	Hand of Modular Blade	Page
GYDRUS20L90C-M20L	Inch	90°	D	GYM20LA-D10	L	F170
			E	GYM20LA-E10		F172
			F	GYM20LA-F10		F174
			G	GYM20LA-G12		F174
			H	GYM20LA-H12		F176
GYDLUS20L90C-M20R	Inch	90°	D	GYM20RA-D10	R	F170
			E	GYM20RA-E10		F172
			F	GYM20RA-F10		F174
			G	GYM20RA-G12		F174
			H	GYM20RA-H12		F176
GYDRUS20S90C-M20L	Inch	90°	D	GYM20LA-D10	L	F170
			E	GYM20LA-E10		F172
			F	GYM20LA-F10		F174
			G	GYM20LA-G12		F174
			H	GYM20LA-H12		F176
GYDLUS20S90C-M20R	Inch	90°	D	GYM20RA-D10	R	F170
			E	GYM20RA-E10		F172
			F	GYM20RA-F10		F174
			G	GYM20RA-G12		F174
			H	GYM20RA-H12		F176
GYDRUS24M90D-M20L	Inch	90°	D	GYM20LA-D10	L	F170
			E	GYM20LA-E10		F172
			F	GYM20LA-F10		F174
			G	GYM20LA-G12		F174
			H	GYM20LA-H12		F176
GYDLUS24M90D-M20R	Inch	90°	D	GYM20RA-D10	R	F170
			E	GYM20RA-E10		F172
			F	GYM20RA-F10		F174
			G	GYM20RA-G12		F174
			H	GYM20RA-H12		F176
GYDRUS24M90D-M25L	Inch	90°	D	GYM25LA-D12	L	F170
			E	GYM25LA-E12		F172
			F	GYM25LA-F12		F174
			G	GYM25LA-G14		F174
			H	GYM25LA-H14		F176
			J	GYM25LA-J14		F176
GYDLUS24M90D-M25R	Inch	90°	D	GYM25RA-D12	R	F170
			E	GYM25RA-E12		F172
			F	GYM25RA-F12		F174
			G	GYM25RA-G14		F174
			H	GYM25RA-H14		F176
			J	GYM25RA-J14		F176
GYDRUS24T90D-M20L	Inch	90°	D	GYM20LA-D10	L	F170
			E	GYM20LA-E10		F172
			F	GYM20LA-F10		F174
			G	GYM20LA-G12		F174
			H	GYM20LA-H12		F176
GYDLUS24T90D-M20R	Inch	90°	D	GYM20RA-D10	R	F170
			E	GYM20RA-E10		F172
			F	GYM20RA-F10		F174
			G	GYM20RA-G12		F174
			H	GYM20RA-H12		F176
GYDRUS24T90D-M25L	Inch	90°	D	GYM25LA-D12	L	F170
			E	GYM25LA-E12		F172
			F	GYM25LA-F12		F174
			G	GYM25LA-G14		F174
			H	GYM25LA-H14		F176
			J	GYM25LA-J14		F176

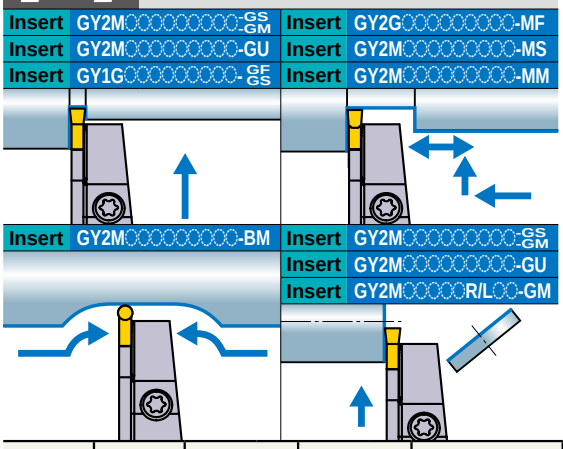
Internal Holder	Inch or Metric	Angle	Seat Size	Modular Blade	Hand of Modular Blade	Page
GYDLUS24T90D-M25R	Inch	90°	D	GYM25RA-D12	R	F170
			E	GYM25RA-E12		F172
			F	GYM25RA-F12		F174
			G	GYM25RA-G14		F174
			H	GYM25RA-H14		F176
			J	GYM25RA-J14		F176
GYDRUS32P90F-M25L	Inch	90°	D	GYM25LA-D12	L	F170
			E	GYM25LA-E12		F172
			F	GYM25LA-F12		F174
			G	GYM25LA-G14		F174
			H	GYM25LA-H14		F176
			J	GYM25LA-J14		F176
GYDLUS32P90F-M25R	Inch	90°	D	GYM25RA-D12	R	F170
			E	GYM25RA-E12		F172
			F	GYM25RA-F12		F174
			G	GYM25RA-G14		F174
			H	GYM25RA-H14		F176
			J	GYM25RA-J14		F176
GYDRUS32T90F-M25L	Inch	90°	D	GYM25LA-D12	L	F170
			E	GYM25LA-E12		F172
			F	GYM25LA-F12		F174
			G	GYM25LA-G14		F174
			H	GYM25LA-H14		F176
			J	GYM25LA-J14		F176
GYDLUS32T90F-M25R	Inch	90°	D	GYM25RA-D12	R	F170
			E	GYM25RA-E12		F172
			F	GYM25RA-F12		F174
			G	GYM25RA-G14		F174
			H	GYM25RA-H14		F176
			J	GYM25RA-J14		F176

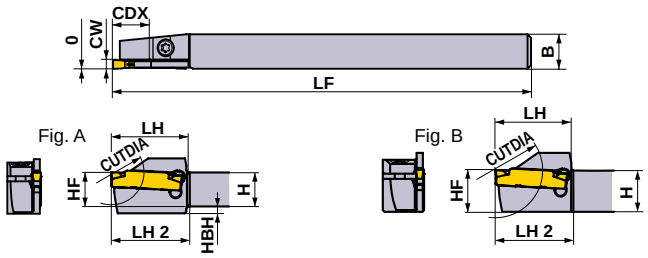
Internal Holder	Inch or Metric	Angle	Seat Size	Modular Blade	Hand of Modular Blade	Page
GYDR32L90C-M20L	Metric	90°	D	GYM20LA-D10	L	F178
			E	GYM20LA-E10		F180
			F	GYM20LA-F10		F182
			G	GYM20LA-G12		F182
			H	GYM20LA-H12		F184
GYDL32L90C-M20R	Metric	90°	D	GYM20RA-D10	R	F178
			E	GYM20RA-E10		F180
			F	GYM20RA-F10		F182
			G	GYM20RA-G12		F182
			H	GYM20RA-H12		F184
GYDR32S90C-M20L	Metric	90°	D	GYM20LA-D10	L	F178
			E	GYM20LA-E10		F180
			F	GYM20LA-F10		F182
			G	GYM20LA-G12		F182
			H	GYM20LA-H12		F184
GYDL32S90C-M20R	Metric	90°	D	GYM20RA-D10	R	F178
			E	GYM20RA-E10		F180
			F	GYM20RA-F10		F182
			G	GYM20RA-G12		F182
			H	GYM20RA-H12		F184
GYDR40M90D-M20L	Metric	90°	D	GYM20LA-D10	L	F178
			E	GYM20LA-E10		F180
			F	GYM20LA-F10		F182
			G	GYM20LA-G12		F182
			H	GYM20LA-H12		F184
GYDL40M90D-M20R	Metric	90°	D	GYM20RA-D10	R	F178
			E	GYM20RA-E10		F180
			F	GYM20RA-F10		F182
			G	GYM20RA-G12		F182
			H	GYM20RA-H12		F184
GYDR40M90D-M25L	Metric	90°	D	GYM25LA-D12	L	F178
			E	GYM25LA-E12		F180
			F	GYM25LA-F12		F182
			G	GYM25LA-G14		F182
			H	GYM25LA-H14		F184
			J	GYM25LA-J14		F184
GYDL40M90D-M25R	Metric	90°	D	GYM25RA-D12	R	F178
			E	GYM25RA-E12		F180
			F	GYM25RA-F12		F182
			G	GYM25RA-G14		F182
			H	GYM25RA-H14		F184
			J	GYM25RA-J14		F184
GYDR40T90D-M20L	Metric	90°	D	GYM20LA-D10	L	F178
			E	GYM20LA-E10		F180
			F	GYM20LA-F10		F182
			G	GYM20LA-G12		F182
			H	GYM20LA-H12		F184
GYDL40T90D-M20R	Metric	90°	D	GYM20RA-D10	R	F178
			E	GYM20RA-E10		F180
			F	GYM20RA-F10		F182
			G	GYM20RA-G12		F182
			H	GYM20RA-H12		F184
GYDR40T90D-M25L	Metric	90°	D	GYM25LA-D12	L	F178
			E	GYM25LA-E12		F180
			F	GYM25LA-F12		F182
			G	GYM25LA-G14		F182
			H	GYM25LA-H14		F184
			J	GYM25LA-J14		F184

Internal Holder	Inch or Metric	Angle	Seat Size	Modular Blade	Hand of Modular Blade	Page
GYDL40T90D-M25R	Metric	90°	D	GYM25RA-D12	R	F178
			E	GYM25RA-E12		F180
			F	GYM25RA-F12		F182
			G	GYM25RA-G14		F182
			H	GYM25RA-H14		F184
			J	GYM25RA-J14		F184
GYDR50P90F-M25L	Metric	90°	D	GYM25LA-D12	L	F178
			E	GYM25LA-E12		F180
			F	GYM25LA-F12		F182
			G	GYM25LA-G14		F182
			H	GYM25LA-H14		F184
			J	GYM25LA-J14		F184
GYDL50P90F-M25R	Metric	90°	D	GYM25RA-D12	R	F178
			E	GYM25RA-E12		F180
			F	GYM25RA-F12		F182
			G	GYM25RA-G14		F182
			H	GYM25RA-H14		F184
			J	GYM25RA-J14		F184
GYDR50T90F-M25L	Metric	90°	D	GYM25LA-D12	L	F178
			E	GYM25LA-E12		F180
			F	GYM25LA-F12		F182
			G	GYM25LA-G14		F182
			H	GYM25LA-H14		F184
			J	GYM25LA-J14		F184
GYDL50T90F-M25R	Metric	90°	D	GYM25RA-D12	R	F178
			E	GYM25RA-E12		F180
			F	GYM25RA-F12		F182
			G	GYM25RA-G14		F182
			H	GYM25RA-H14		F184
			J	GYM25RA-J14		F184

GY SERIES (EXTERNAL GROOVING for Swiss style lathes)

1-1 00° type holder (Inch) NEW





Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch) ✶4	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Fig.
C	.059	.433	.866	Mono Block	R	GYSRUS06B00-C11	●	A
					L	GYSLUS06B00-C11	●	A
		.512	1.024	Mono Block	R	GYSRUS08B00-C13	●	B
					L	GYSLUS08B00-C13	●	B
		.669 ✶1	1.338 ✶2	Mono Block	R	GYSRUS10B00-C17	●	B
					L	GYSLUS10B00-C17	●	B
				Mono Block	R	GYSRUS12B00-C17	●	B
					L	GYSLUS12B00-C17	●	B
D	.079 .088	.433	.866	Mono Block	R	GYSRUS06B00-D11	●	A
					L	GYSLUS06B00-D11	●	A
		.512	1.024	Mono Block	R	GYSRUS08B00-D13	●	B
					L	GYSLUS08B00-D13	●	B
		.669 ✶1	1.338 ✶2	Mono Block	R	GYSRUS10B00-D17	●	B
					L	GYSLUS10B00-D17	●	B
				Mono Block	R	GYSRUS12B00-D17	●	B
					L	GYSLUS12B00-D17	●	B
E	.094 .098 .108	.433	.866	Mono Block	R	GYSRUS06B00-E11	●	A
					L	GYSLUS06B00-E11	●	A
		.512	1.024	Mono Block	R	GYSRUS08B00-E13	●	B
					L	GYSLUS08B00-E13	●	B
		.669 ✶1	1.338 ✶2	Mono Block	R	GYSRUS10B00-E17	●	B
					L	GYSLUS10B00-E17	●	B
				Mono Block	R	GYSRUS12B00-E17	●	B
					L	GYSLUS12B00-E17	●	B
		.787 ✶1	1.574 ✶2	Mono Block	R	GYSRUS10B00-E20	●	B
					L	GYSLUS10B00-E20	●	B
				Mono Block	R	GYSRUS12B00-E20	●	B
					L	GYSLUS12B00-E20	●	B
F	.118 .125 .128	.512	1.024	Mono Block	R	GYSRUS08B00-F13	●	B
					L	GYSLUS08B00-F13	●	B
		.669 ✶1	1.338 ✶2	Mono Block	R	GYSRUS10B00-F17	●	B
					L	GYSLUS10B00-F17	●	B
				Mono Block	R	GYSRUS12B00-F17	●	B
					L	GYSLUS12B00-F17	●	B
		.787 ✶1	1.574 ✶2	Mono Block	R	GYSRUS10B00-F20	●	B
					L	GYSLUS10B00-F20	●	B
				Mono Block	R	GYSRUS12B00-F20	●	B
					L	GYSLUS12B00-F20	●	B

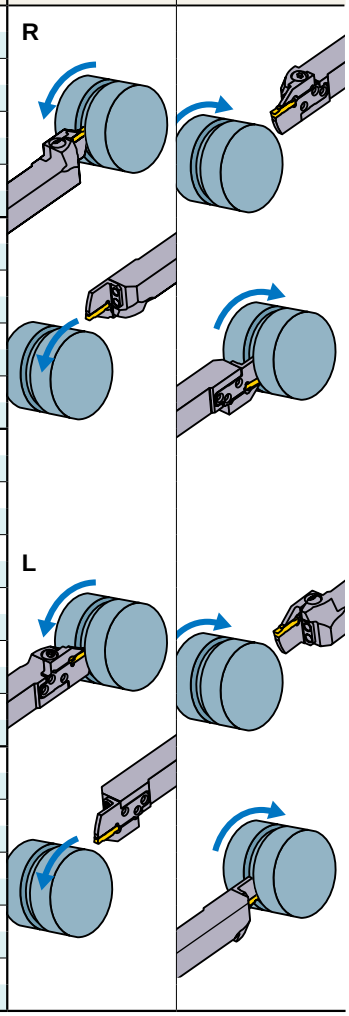
✶1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
✶4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F208.

● : Inventory maintained.

SPARE PARTS

Holder Number	 Clamp Screw	 Wrench
GYSR/LUS06B00-○11	CS350990T (Clamp Torque : 22 lbf-in)	TKY10R
GYSR/LUS08B00-○13		
GYSR/LUS10B00-○18	TS4SBL (Clamp Torque : 31 lbf-in)	TKY15R
GYSR/LUS12B00-○17		

Dimensions (inch) *3							Cutting Mode	
H	**B**	**LF**	**LH**	**LH 2**	**HF**	**HBH**	Clockwise	Anticlockwise
.375	.375	4.500	.866	.620	.375	.125	R	
.375	.375	4.500	.866	.620	.375	.125		
.500	.500	4.500	.866	.620	.500	–		
.500	.500	4.500	.866	.620	.500	–		
.625	.625	4.500	1.063	.638	.625	–		
.625	.625	4.500	1.063	.638	.625	–		
.750	.750	4.500	1.102	.638	.750	–		
.750	.750	4.500	1.102	.638	.750	–		
.375	.375	4.500	.866	.899	.375	.125		
.375	.375	4.500	.866	.899	.375	.125		
.500	.500	4.500	.866	.899	.500	–		
.500	.500	4.500	.866	.899	.500	–		
.625	.625	4.500	1.063	.918	.625	–		
.625	.625	4.500	1.063	.918	.625	–		
.750	.750	4.500	1.102	.878	.750	–		
.750	.750	4.500	1.102	.878	.750	–		
.375	.375	4.500	.866	.901	.375	.125		
.375	.375	4.500	.866	.901	.375	.125		
.500	.500	4.500	.866	.901	.500	–		
.500	.500	4.500	.866	.901	.500	–		
.625	.625	4.500	1.063	.920	.625	–	L	
.625	.625	4.500	1.063	.920	.625	–		
.750	.750	4.500	1.102	.880	.750	–		
.750	.750	4.500	1.102	.880	.750	–		
.625	.625	4.500	1.220	.920	.625	–		
.625	.625	4.500	1.220	.920	.625	–		
.750	.750	4.500	1.220	.880	.750	–		
.750	.750	4.500	1.220	.880	.750	–		
.500	.500	4.500	.866	.903	.500	–		
.500	.500	4.500	.866	.903	.500	–		
.625	.625	4.500	1.063	.925	.625	–		
.625	.625	4.500	1.063	.925	.625	–		
.750	.750	4.500	1.102	.885	.750	–		
.750	.750	4.500	1.102	.885	.750	–		
.625	.625	4.500	1.220	.925	.625	–		
.625	.625	4.500	1.220	.925	.625	–		
.750	.750	4.500	1.220	.885	.750	–		
.750	.750	4.500	1.220	.885	.750	–		



Select an Insert

Seat Size	Insert Number
C	**GY○○0150C○○○○–Breaker**
D	**GY○○0200/0224D○○○○–Breaker**
E	**GY○○0239/0250/0274E○○○○–Breaker**
F	**GY○○0300/0318/0324F○○○○–Breaker**

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
C	.059", 1.50mm		●	●		
D	.079", 2.00mm	●	●	●	●	●
E	.094", 2.39mm	●	●	●		●
	.098", 2.50mm	●	●	●	●	●
F	.118", 3.00mm	●	●	●	●	●
	.125", 3.18mm	●	●	●		●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
D	.079", 2.00mm	●	●	●	●
	.088", 2.24mm	●			
E	.094", 2.39mm	●			
	.098", 2.50mm	●	●	●	●
	.108", 2.74mm	●			
F	.118", 3.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24mm	●			

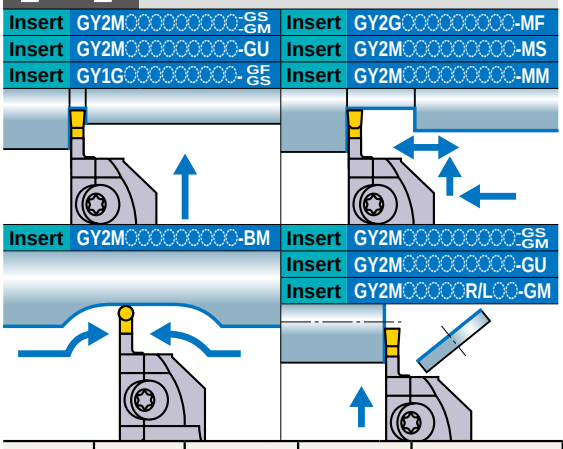
● : Gauge insert shown dimensions

GROOVING

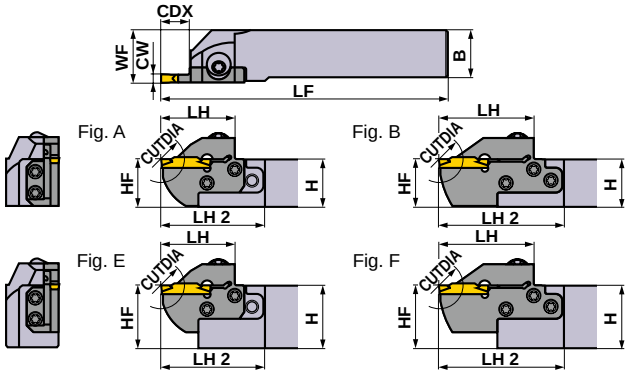
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F208

GY SERIES (EXTERNAL GROOVING)

1-1 00° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

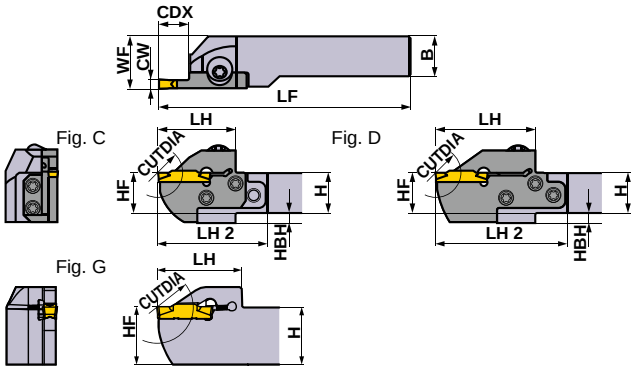


Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
D	.079 .088	.236	.472	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-D06	●	C
					L	GYHLUS10B00-M20L	●	GYM20LA-D06	●	C
				Modular	R	GYHRUS12C00-M20R	●	GYM20RA-D06	●	A
					L	GYHLUS12C00-M20L	●	GYM20LA-D06	●	A
				Modular	R	GYHRUS12C00-M25R	●	GYM25RA-D06	●	C
					L	GYHLUS12C00-M25L	●	GYM25LA-D06	●	C
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-D06	●	A
					L	GYHLUS16D00-M25L	●	GYM25LA-D06	●	A
				Mono Block	R	GYQRUS16D00-D06	●	—	—	G
					L	GYQLUS16D00-D06	●	—	—	G
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-D06	●	E
					L	GYHLUS20D00-M25L	●	GYM25LA-D06	●	E
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-D06	●	E
					L	GYHLUS24E00-M25L	●	GYM25LA-D06	●	E
		.394	.787	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-D10	●	C
					L	GYHLUS10B00-M20L	●	GYM20LA-D10	●	C
				Modular	R	GYHRUS12C00-M20R	●	GYM20RA-D10	●	A
					L	GYHLUS12C00-M20L	●	GYM20LA-D10	●	A
		.472	.945	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-D12	●	C
					L	GYHLUS12C00-M25L	●	GYM25LA-D12	●	C
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-D12	●	A
					L	GYHLUS16D00-M25L	●	GYM25LA-D12	●	A
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-D12	●	E
					L	GYHLUS20D00-M25L	●	GYM25LA-D12	●	E
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-D12	●	E
					L	GYHLUS24E00-M25L	●	GYM25LA-D12	●	E
		.709 ✶4	1.417	Modular	R	GYHRUS10B00-M20R	●	GYM20RB-D18	●	D
					L	GYHLUS10B00-M20L	●	GYM20LB-D18	●	D
				Modular	R	GYHRUS12C00-M20R	●	GYM20RB-D18	●	B
					L	GYHLUS12C00-M20L	●	GYM20LB-D18	●	B
		.787 ✶1	1.575 ✶2	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-D20	●	D
					L	GYHLUS12C00-M25L	●	GYM25LA-D20	●	D
				Mono Block	R	GYQRUS16D00-D20	●	—	—	G
					L	GYQLUS16D00-D20	●	—	—	G
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-D20	●	B
					L	GYHLUS16D00-M25L	●	GYM25LA-D20	●	B
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-D20	●	F
					L	GYHLUS20D00-M25L	●	GYM25LA-D20	●	F
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-D20	●	F
					L	GYHLUS24E00-M25L	●	GYM25LA-D20	●	F

✶1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.
✶4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

● : **Inventory maintained.**



Right hand tool holder shown.

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw	Wrench *
GYQR/LUS○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/LUS○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/LUS○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (inch) *3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
.625	.625	4.264	1.102	1.761	.625	.812	.125	R	
.625	.625	4.264	1.102	1.761	.625	.812	.125		
.750	.750	4.764	1.102	1.698	.750	.875	—		
.750	.750	4.764	1.102	1.698	.750	.875	—		
.750	.750	4.685	1.220	2.060	.750	1.000	.250		
.750	.750	4.685	1.220	2.060	.750	1.000	.250		
1.000	1.000	5.685	1.220	1.934	1.000	1.125	—		
1.000	1.000	5.685	1.220	1.934	1.000	1.125	—		
1.000	1.000	6.000	1.417	—	1.000	1.006	—		
1.000	1.000	6.000	1.417	—	1.000	1.006	—		
1.250	1.250	5.685	1.220	1.942	1.250	1.375	—		
1.250	1.250	5.685	1.220	1.942	1.250	1.375	—		
1.500	1.500	6.685	1.220	1.926	1.500	1.625	—		
1.500	1.500	6.685	1.220	1.926	1.500	1.625	—		
.625	.625	4.500	1.339	1.997	.625	.812	.125		
.625	.625	4.500	1.339	1.997	.625	.812	.125		
.750	.750	5.000	1.339	1.934	.750	.875	—		
.750	.750	5.000	1.339	1.934	.750	.875	—		
.750	.750	5.000	1.535	2.375	.750	1.000	.250		
.750	.750	5.000	1.535	2.375	.750	1.000	.250		
1.000	1.000	6.000	1.535	2.249	1.000	1.125	—	L	
1.000	1.000	6.000	1.535	2.249	1.000	1.125	—		
1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
.625	.625	4.736	1.575	2.233	.625	.812	.125		
.625	.625	4.736	1.575	2.233	.625	.812	.125		
.750	.750	5.236	1.575	2.170	.750	.875	—		
.750	.750	5.236	1.575	2.170	.750	.875	—		
.750	.750	5.236	1.772	2.611	.750	1.000	.250		
.750	.750	5.236	1.772	2.611	.750	1.000	.250		
1.000	1.000	6.000	1.614	—	1.000	1.004	—		
1.000	1.000	6.000	1.614	—	1.000	1.004	—		
1.000	1.000	6.236	1.772	2.485	1.000	1.125	—		
1.000	1.000	6.236	1.772	2.485	1.000	1.125	—		
1.250	1.250	6.236	1.772	2.493	1.250	1.375	—		
1.250	1.250	6.236	1.772	2.493	1.250	1.375	—		
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—		
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—		

Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
D	.079", 2.00mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

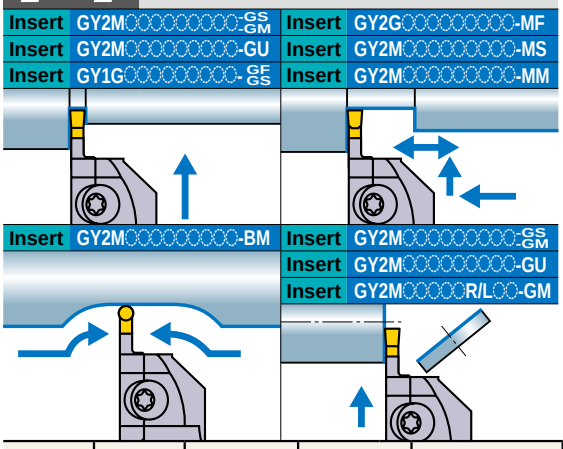
Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
D	.079", 2.00mm	●	●	●	●
	.088", 2.24mm	●			

● : Gauge insert shown dimensions

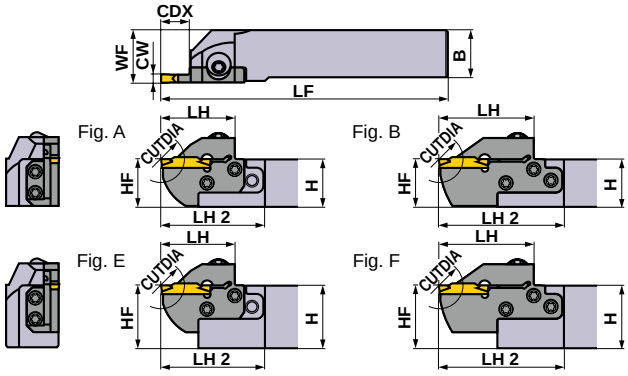
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

1-1 00° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

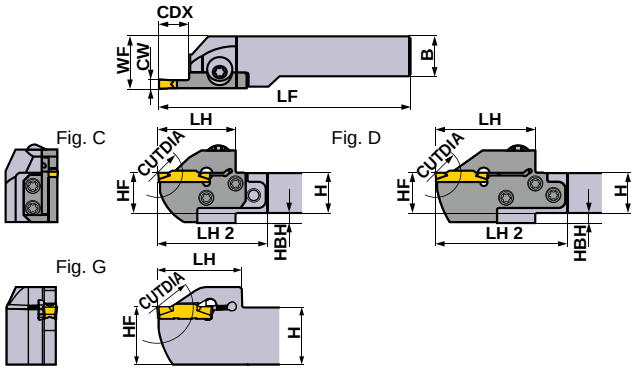


Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
E	.094 .098 .108	.236	.472	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-E06	●	C
					L	GYHLUS10B00-M20L	●	GYM20LA-E06	●	C
				Modular	R	GYHRUS12C00-M20R	●	GYM20RA-E06	●	A
					L	GYHLUS12C00-M20L	●	GYM20LA-E06	●	A
				Modular	R	GYHRUS12C00-M25R	●	GYM25RA-E06	●	C
					L	GYHLUS12C00-M25L	●	GYM25LA-E06	●	C
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-E06	●	A
					L	GYHLUS16D00-M25L	●	GYM25LA-E06	●	A
				Mono Block	R	GYQRUS16D00-E06	●	—	—	G
					L	GYQLUS16D00-E06	●	—	—	G
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-E06	●	E
					L	GYHLUS20D00-M25L	●	GYM25LA-E06	●	E
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-E06	●	E
					L	GYHLUS24E00-M25L	●	GYM25LA-E06	●	E
		.394	.787	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-E10	●	C
					L	GYHLUS10B00-M20L	●	GYM20LA-E10	●	C
				Modular	R	GYHRUS12C00-M20R	●	GYM20RA-E10	●	A
					L	GYHLUS12C00-M20L	●	GYM20LA-E10	●	A
		.472	.945	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-E12	●	C
					L	GYHLUS12C00-M25L	●	GYM25LA-E12	●	C
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-E12	●	A
					L	GYHLUS16D00-M25L	●	GYM25LA-E12	●	A
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-E12	●	E
					L	GYHLUS20D00-M25L	●	GYM25LA-E12	●	E
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-E12	●	E
					L	GYHLUS24E00-M25L	●	GYM25LA-E12	●	E
		.709 ✶4	1.417	Modular	R	GYHRUS10B00-M20R	●	GYM20RB-E18	●	D
					L	GYHLUS10B00-M20L	●	GYM20LB-E18	●	D
				Modular	R	GYHRUS12C00-M20R	●	GYM20RB-E18	●	B
					L	GYHLUS12C00-M20L	●	GYM20LB-E18	●	B
		.787 ✶1	1.575 ✶2	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-E20	●	D
					L	GYHLUS12C00-M25L	●	GYM25LA-E20	●	D
				Mono Block	R	GYQRUS16D00-E20	●	—	—	G
					L	GYQLUS16D00-E20	●	—	—	G
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-E20	●	B
					L	GYHLUS16D00-M25L	●	GYM25LA-E20	●	B
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-E20	●	F
					L	GYHLUS20D00-M25L	●	GYM25LA-E20	●	F
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-E20	●	F
					L	GYHLUS24E00-M25L	●	GYM25LA-E20	●	F

✶1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.
✶4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

● : **Inventory maintained.**



Right hand tool holder shown.

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench *
GYQR/LUS○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/LUS○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/LUS○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (inch) *3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
.625	.625	4.264	1.102	1.761	.625	.812	.125	R	
.625	.625	4.264	1.102	1.761	.625	.812	.125		
.750	.750	4.764	1.102	1.698	.750	.875	—		
.750	.750	4.764	1.102	1.698	.750	.875	—		
.750	.750	4.685	1.220	2.060	.750	1.000	.250		
.750	.750	4.685	1.220	2.060	.750	1.000	.250		
1.000	1.000	5.685	1.220	1.934	1.000	1.125	—		
1.000	1.000	5.685	1.220	1.934	1.000	1.125	—		
1.000	1.000	6.000	1.417	—	1.000	1.008	—		
1.000	1.000	6.000	1.417	—	1.000	1.008	—		
1.250	1.250	5.685	1.220	1.942	1.250	1.375	—		
1.250	1.250	5.685	1.220	1.942	1.250	1.375	—		
1.500	1.500	6.685	1.220	1.926	1.500	1.625	—		
1.500	1.500	6.685	1.220	1.926	1.500	1.625	—		
.625	.625	4.500	1.339	1.997	.625	.812	.125		
.625	.625	4.500	1.339	1.997	.625	.812	.125		
.750	.750	5.000	1.339	1.934	.750	.875	—		
.750	.750	5.000	1.339	1.934	.750	.875	—		
.750	.750	5.000	1.535	2.375	.750	1.000	.250		
.750	.750	5.000	1.535	2.375	.750	1.000	.250		
1.000	1.000	6.000	1.535	2.249	1.000	1.125	—	L	
1.000	1.000	6.000	1.535	2.249	1.000	1.125	—		
1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
.625	.625	4.736	1.575	2.233	.625	.812	.125		
.625	.625	4.736	1.575	2.233	.625	.812	.125		
.750	.750	5.236	1.575	2.170	.750	.875	—		
.750	.750	5.236	1.575	2.170	.750	.875	—		
.750	.750	5.236	1.772	2.611	.750	1.000	.250		
.750	.750	5.236	1.772	2.611	.750	1.000	.250		
1.000	1.000	6.000	1.614	—	1.000	1.004	—		
1.000	1.000	6.000	1.614	—	1.000	1.004	—		
1.000	1.000	6.236	1.772	2.485	1.000	1.125	—		
1.000	1.000	6.236	1.772	2.485	1.000	1.125	—		
1.250	1.250	6.236	1.772	2.493	1.250	1.375	—		
1.250	1.250	6.236	1.772	2.493	1.250	1.375	—		
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—		
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—		

Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
E	.094", 2.39mm	●	●	●		●
	.098", 2.50mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
E	.094", 2.39mm	●			
	.098", 2.50mm	●	●	●	●
	.108", 2.74mm	●			

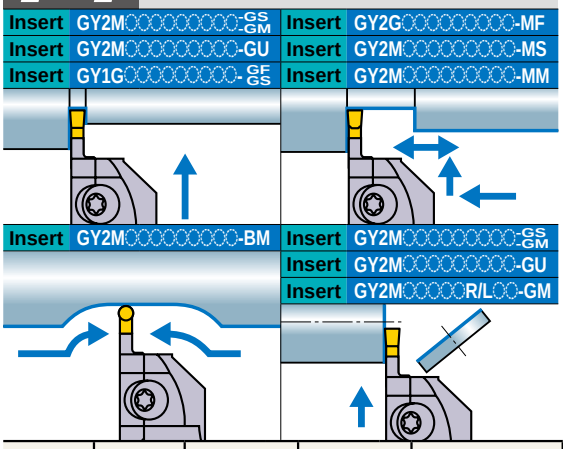
● : Gauge insert shown dimensions

GROOVING

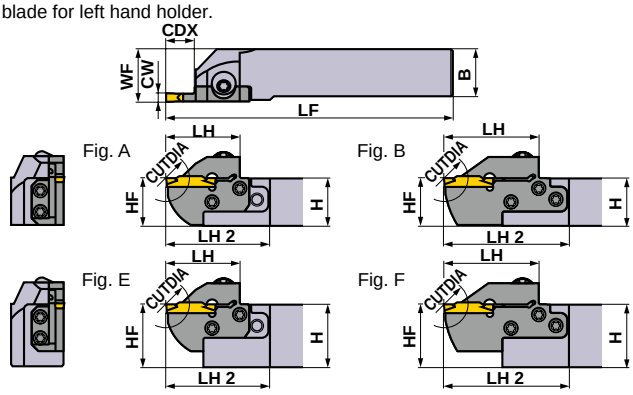
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

1-1 00° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

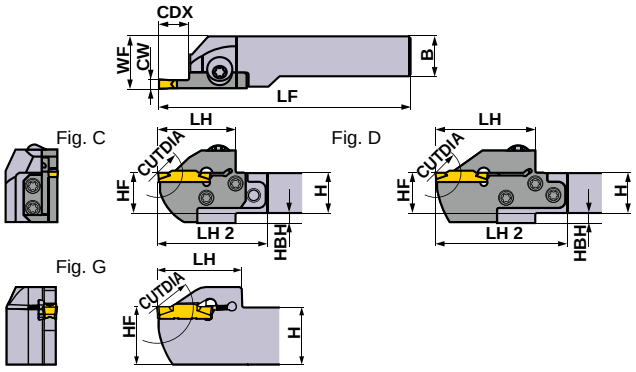


Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
F	.118 .125 .128	.236	.472	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-F06	●	C
					L	GYHLUS10B00-M20L	●	GYM20LA-F06	●	C
				Modular	R	GYHRUS12C00-M20R	●	GYM20RA-F06	●	A
					L	GYHLUS12C00-M20L	●	GYM20LA-F06	●	A
				Modular	R	GYHRUS12C00-M25R	●	GYM25RA-F06	●	C
					L	GYHLUS12C00-M25L	●	GYM25LA-F06	●	C
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-F06	●	A
					L	GYHLUS16D00-M25L	●	GYM25LA-F06	●	A
				Mono Block	R	GYQRUS16D00-F06	●	—	—	G
					L	GYQLUS16D00-F06	●	—	—	G
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-F06	●	E
					L	GYHLUS20D00-M25L	●	GYM25LA-F06	●	E
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-F06	●	E
					L	GYHLUS24E00-M25L	●	GYM25LA-F06	●	E
		.394	.787	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-F10	●	C
					L	GYHLUS10B00-M20L	●	GYM20LA-F10	●	C
				Modular	R	GYHRUS12C00-M20R	●	GYM20RA-F10	●	A
					L	GYHLUS12C00-M20L	●	GYM20LA-F10	●	A
		.472	.945	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-F12	●	C
					L	GYHLUS12C00-M25L	●	GYM25LA-F12	●	C
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-F12	●	A
					L	GYHLUS16D00-M25L	●	GYM25LA-F12	●	A
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-F12	●	E
					L	GYHLUS20D00-M25L	●	GYM25LA-F12	●	E
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-F12	●	E
					L	GYHLUS24E00-M25L	●	GYM25LA-F12	●	E
		.709 ✶4	1.417	Modular	R	GYHRUS10B00-M20R	●	GYM20RB-F18	●	D
					L	GYHLUS10B00-M20L	●	GYM20LB-F18	●	D
				Modular	R	GYHRUS12C00-M20R	●	GYM20RB-F18	●	B
					L	GYHLUS12C00-M20L	●	GYM20LB-F18	●	B
		.787 ✶1	1.575 ✶2	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-F20	●	D
					L	GYHLUS12C00-M25L	●	GYM25LA-F20	●	D
				Mono Block	R	GYQRUS16D00-F20	●	—	—	G
					L	GYQLUS16D00-F20	●	—	—	G
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-F20	●	B
					L	GYHLUS16D00-M25L	●	GYM25LA-F20	●	B
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-F20	●	F
					L	GYHLUS20D00-M25L	●	GYM25LA-F20	●	F
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-F20	●	F
					L	GYHLUS24E00-M25L	●	GYM25LA-F20	●	F

✶1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.
✶4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

● : Inventory maintained.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/LUS○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/LUS○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/LUS○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (inch) ∗3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
.625	.625	4.264	1.102	1.761	.625	.812	.125	R	
.625	.625	4.264	1.102	1.761	.625	.812	.125		
.750	.750	4.764	1.102	1.698	.750	.875	—		
.750	.750	4.764	1.102	1.698	.750	.875	—		
.750	.750	4.685	1.220	2.060	.750	1.000	.250		
.750	.750	4.685	1.220	2.060	.750	1.000	.250		
1.000	1.000	5.685	1.220	1.934	1.000	1.125	—		
1.000	1.000	5.685	1.220	1.934	1.000	1.125	—		
1.000	1.000	6.000	1.417	—	1.000	1.012	—		
1.000	1.000	6.000	1.417	—	1.000	1.012	—		
1.250	1.250	5.685	1.220	1.942	1.250	1.375	—		
1.250	1.250	5.685	1.220	1.942	1.250	1.375	—		
1.500	1.500	6.685	1.220	1.926	1.500	1.625	—		
1.500	1.500	6.685	1.220	1.926	1.500	1.625	—		
.625	.625	4.500	1.339	1.997	.625	.812	.125		
.625	.625	4.500	1.339	1.997	.625	.812	.125		
.750	.750	5.000	1.339	1.934	.750	.875	—		
.750	.750	5.000	1.339	1.934	.750	.875	—		
.750	.750	5.000	1.535	2.375	.750	1.000	.250		
.750	.750	5.000	1.535	2.375	.750	1.000	.250		
1.000	1.000	6.000	1.535	2.249	1.000	1.125	—	L	
1.000	1.000	6.000	1.535	2.249	1.000	1.125	—		
1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
.625	.625	4.736	1.575	2.233	.625	.812	.125		
.625	.625	4.736	1.575	2.233	.625	.812	.125		
.750	.750	5.236	1.575	2.170	.750	.875	—		
.750	.750	5.236	1.575	2.170	.750	.875	—		
.750	.750	5.236	1.772	2.611	.750	1.000	.250		
.750	.750	5.236	1.772	2.611	.750	1.000	.250		
1.000	1.000	6.000	1.614	—	1.000	1.010	—		
1.000	1.000	6.000	1.614	—	1.000	1.010	—		
1.000	1.000	6.236	1.772	2.485	1.000	1.125	—		
1.000	1.000	6.236	1.772	2.485	1.000	1.125	—		
1.250	1.250	6.236	1.772	2.493	1.250	1.375	—		
1.250	1.250	6.236	1.772	2.493	1.250	1.375	—		
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—		
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—		

Select an Insert

Seat Size	Insert Number
F	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
F	.118", 3.00mm	●	●	●	●	●
	.125", 3.18mm	●	●	●		●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
F	.118", 3.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24mm	●			

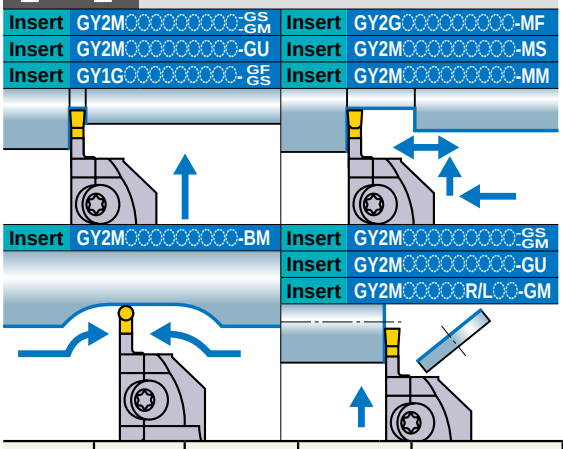
● : Gauge insert shown dimensions

GROOVING

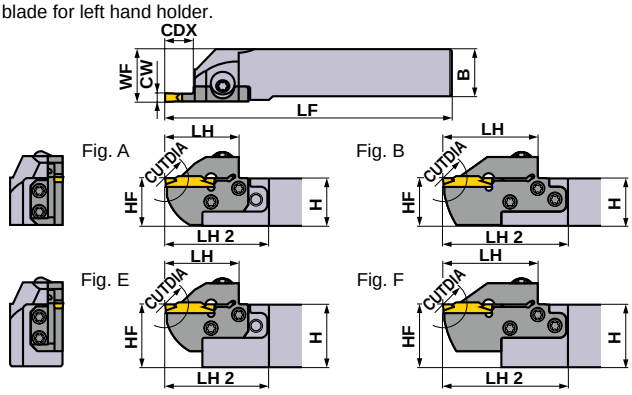
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

1-1 00° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

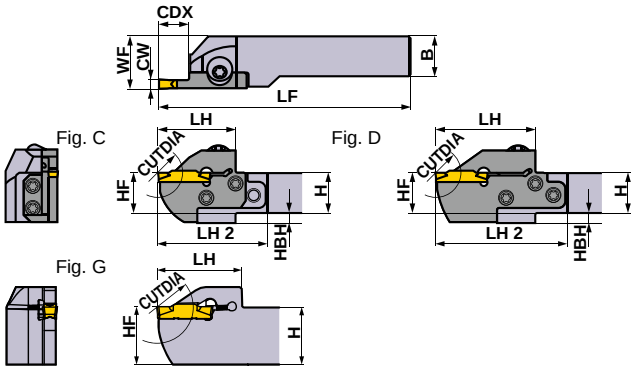


Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
G	.157 .167	.315	.630	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-G08	●	C
					L	GYHLUS12C00-M25L	●	GYM25LA-G08	●	C
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-G08	●	A
					L	GYHLUS16D00-M25L	●	GYM25LA-G08	●	A
				Mono Block	R	GYQRUS16D00-G08	●	—	—	G
					L	GYQLUS16D00-G08	●	—	—	G
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-G08	●	E
					L	GYHLUS20D00-M25L	●	GYM25LA-G08	●	E
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-G08	●	E
					L	GYHLUS24E00-M25L	●	GYM25LA-G08	●	E
		.472	.945	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-G12	●	C
					L	GYHLUS10B00-M20L	●	GYM20LA-G12	●	C
				Modular	R	GYHRUS12C00-M20R	●	GYM20RA-G12	●	A
					L	GYHLUS12C00-M20L	●	GYM20LA-G12	●	A
		.551	1.102	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-G14	●	C
					L	GYHLUS12C00-M25L	●	GYM25LA-G14	●	C
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-G14	●	A
					L	GYHLUS16D00-M25L	●	GYM25LA-G14	●	A
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-G14	●	E
					L	GYHLUS20D00-M25L	●	GYM25LA-G14	●	E
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-G14	●	E
					L	GYHLUS24E00-M25L	●	GYM25LA-G14	●	E
		.984 ✶1	1.969 ✶2	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-G25	●	D
					L	GYHLUS12C00-M25L	●	GYM25LA-G25	●	D
				Mono Block	R	GYQRUS16D00-G25	●	—	—	G
					L	GYQLUS16D00-G25	●	—	—	G
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-G25	●	B
					L	GYHLUS16D00-M25L	●	GYM25LA-G25	●	B
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-G25	●	F
					L	GYHLUS20D00-M25L	●	GYM25LA-G25	●	F
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-G25	●	F
					L	GYHLUS24E00-M25L	●	GYM25LA-G25	●	F

✶1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : Inventory maintained.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/LUS○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/LUS○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/LUS○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (inch) ∗3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
.750	.750	4.764	1.299	2.139	.750	1.000	.250	R	
.750	.750	4.764	1.299	2.139	.750	1.000	.250		
1.000	1.000	5.764	1.299	2.013	1.000	1.125	—		
1.000	1.000	5.764	1.299	2.013	1.000	1.125	—		
1.000	1.000	6.000	1.614	—	1.000	1.014	—		
1.000	1.000	6.000	1.614	—	1.000	1.014	—		
1.250	1.250	5.764	1.299	2.021	1.250	1.375	—		
1.250	1.250	5.764	1.299	2.021	1.250	1.375	—		
1.500	1.500	6.764	1.299	2.005	1.500	1.625	—		
1.500	1.500	6.764	1.299	2.005	1.500	1.625	—		
.625	.625	4.500	1.339	1.997	.625	.812	.125		
.625	.625	4.500	1.339	1.997	.625	.812	.125		
.750	.750	5.000	1.339	1.934	.750	.875	—		
.750	.750	5.000	1.339	1.934	.750	.875	—		
.750	.750	5.000	1.535	2.375	.750	1.000	.250		
.750	.750	5.000	1.535	2.375	.750	1.000	.250		
1.000	1.000	6.000	1.535	2.249	1.000	1.125	—		
1.000	1.000	6.000	1.535	2.249	1.000	1.125	—		
1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
.750	.750	5.433	1.969	2.808	.750	1.000	.250	L	
.750	.750	5.433	1.969	2.808	.750	1.000	.250		
1.000	1.000	6.000	1.811	—	1.000	1.014	—		
1.000	1.000	6.000	1.811	—	1.000	1.014	—		
1.000	1.000	6.433	1.969	2.682	1.000	1.125	—		
1.000	1.000	6.433	1.969	2.682	1.000	1.125	—		
1.250	1.250	6.433	1.969	2.690	1.250	1.375	—		
1.250	1.250	6.433	1.969	2.690	1.250	1.375	—		
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—		
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—		

Select an Insert

Seat Size	Insert Number
G	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
G	.157", 4.00mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
G	.157", 4.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24mm	●			

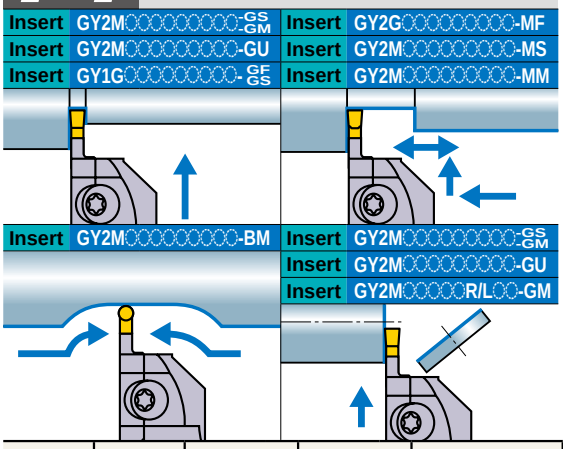
● : Gauge insert shown dimensions

GROOVING

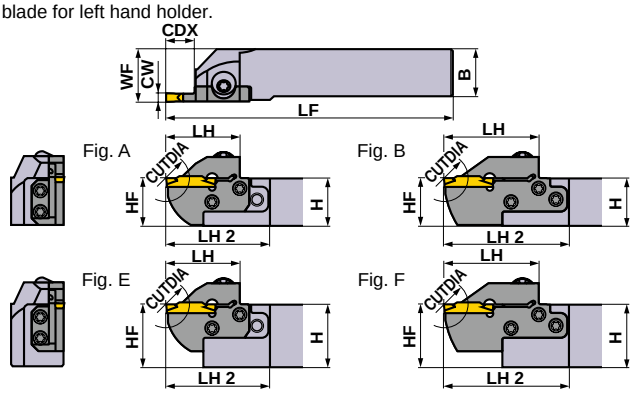
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

1-1 00° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

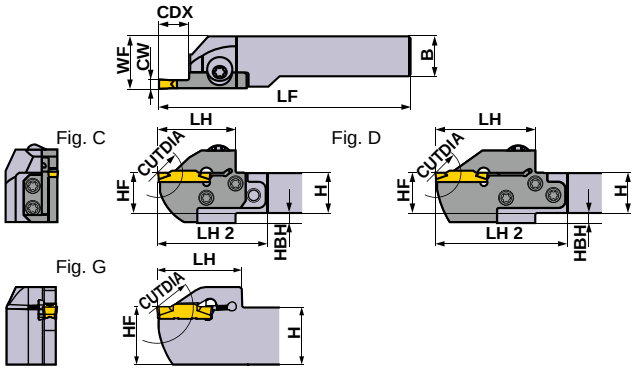


Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	.187 .197 .206	.315	.630	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-H08	●	C
					L	GYHLUS12C00-M25L	●	GYM25LA-H08	●	C
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-H08	●	A
					L	GYHLUS16D00-M25L	●	GYM25LA-H08	●	A
				Mono Block	R	GYQRUS16D00-H08	●	—	—	G
					L	GYQLUS16D00-H08	●	—	—	G
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-H08	●	E
					L	GYHLUS20D00-M25L	●	GYM25LA-H08	●	E
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-H08	●	E
					L	GYHLUS24E00-M25L	●	GYM25LA-H08	●	E
		.472	.945	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-H12	●	C
					L	GYHLUS10B00-M20L	●	GYM20LA-H12	●	C
				Modular	R	GYHRUS12C00-M20R	●	GYM20RA-H12	●	A
					L	GYHLUS12C00-M20L	●	GYM20LA-H12	●	A
		.551	1.102	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-H14	●	C
					L	GYHLUS12C00-M25L	●	GYM25LA-H14	●	C
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-H14	●	A
					L	GYHLUS16D00-M25L	●	GYM25LA-H14	●	A
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-H14	●	E
					L	GYHLUS20D00-M25L	●	GYM25LA-H14	●	E
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-H14	●	E
					L	GYHLUS24E00-M25L	●	GYM25LA-H14	●	E
		.984 ✱1	1.969 ✱2	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-H25	●	D
					L	GYHLUS12C00-M25L	●	GYM25LA-H25	●	D
				Mono Block	R	GYQRUS16D00-H25	●	—	—	G
					L	GYQLUS16D00-H25	●	—	—	G
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-H25	●	B
					L	GYHLUS16D00-M25L	●	GYM25LA-H25	●	B
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-H25	●	F
					L	GYHLUS20D00-M25L	●	GYM25LA-H25	●	F
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-H25	●	F
					L	GYHLUS24E00-M25L	●	GYM25LA-H25	●	F

✱1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
✱2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
✱3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : **Inventory maintained.**



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/LUS○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/LUS○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/LUS○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (inch) ∗3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
.750	.750	4.764	1.299	2.139	.750	1.000	.250	R	
.750	.750	4.764	1.299	2.139	.750	1.000	.250		
1.000	1.000	5.764	1.299	2.013	1.000	1.125	—		
1.000	1.000	5.764	1.299	2.013	1.000	1.125	—		
1.000	1.000	6.000	1.614	—	1.000	1.014	—		
1.000	1.000	6.000	1.614	—	1.000	1.014	—		
1.250	1.250	5.764	1.299	2.021	1.250	1.375	—		
1.250	1.250	5.764	1.299	2.021	1.250	1.375	—		
1.500	1.500	6.764	1.299	2.005	1.500	1.625	—		
1.500	1.500	6.764	1.299	2.005	1.500	1.625	—		
.625	.625	4.500	1.339	1.997	.625	.812	.125		
.625	.625	4.500	1.339	1.997	.625	.812	.125		
.750	.750	5.000	1.339	1.934	.750	.875	—		
.750	.750	5.000	1.339	1.934	.750	.875	—		
.750	.750	5.000	1.535	2.375	.750	1.000	.250		
.750	.750	5.000	1.535	2.375	.750	1.000	.250		
1.000	1.000	6.000	1.535	2.249	1.000	1.125	—		
1.000	1.000	6.000	1.535	2.249	1.000	1.125	—		
1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
.750	.750	5.433	1.969	2.808	.750	1.000	.250	L	
.750	.750	5.433	1.969	2.808	.750	1.000	.250		
1.000	1.000	6.000	1.811	—	1.000	1.014	—		
1.000	1.000	6.000	1.811	—	1.000	1.014	—		
1.000	1.000	6.433	1.969	2.682	1.000	1.125	—		
1.000	1.000	6.433	1.969	2.682	1.000	1.125	—		
1.250	1.250	6.433	1.969	2.690	1.250	1.375	—		
1.250	1.250	6.433	1.969	2.690	1.250	1.375	—		
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—		
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—		

Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
H	.187", 4.75mm	●	●	●		●
	.197", 5.00mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
H	.187", 4.75mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24mm	●			

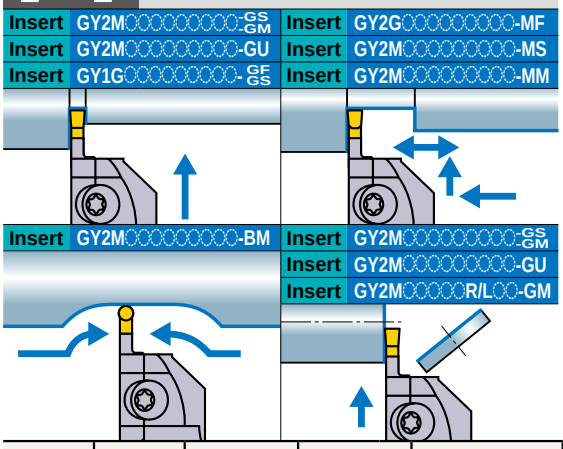
● : Gauge insert shown dimensions

GROOVING

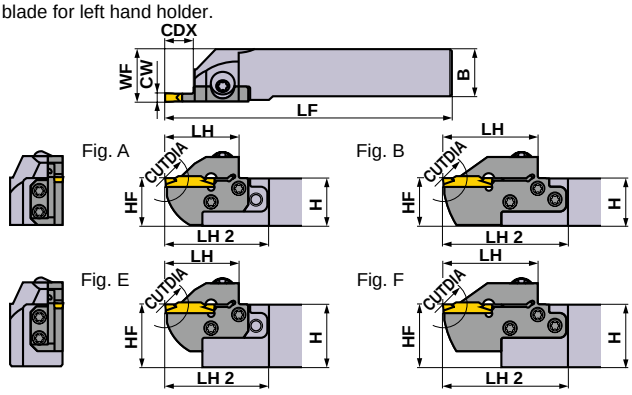
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

1-1 00° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

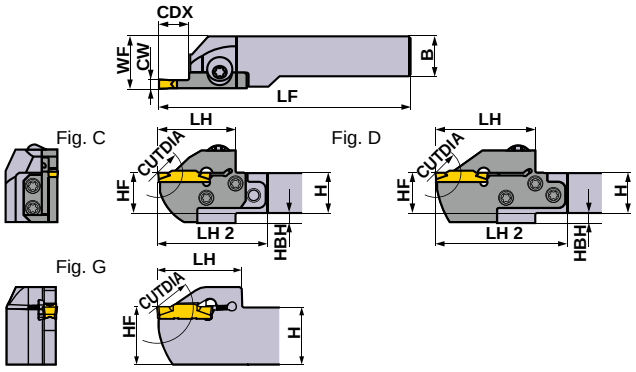


Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
J	.236 .248 .250	.315	.630	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-J08	●	C
					L	GYHLUS12C00-M25L	●	GYM25LA-J08	●	C
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-J08	●	A
					L	GYHLUS16D00-M25L	●	GYM25LA-J08	●	A
				Mono Block	R	GYQRUS16D00-J08	●	—	—	G
					L	GYQLUS16D00-J08	●	—	—	G
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-J08	●	E
					L	GYHLUS20D00-M25L	●	GYM25LA-J08	●	E
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-J08	●	E
					L	GYHLUS24E00-M25L	●	GYM25LA-J08	●	E
		.551	1.102	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-J14	●	C
					L	GYHLUS12C00-M25L	●	GYM25LA-J14	●	C
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-J14	●	A
					L	GYHLUS16D00-M25L	●	GYM25LA-J14	●	A
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-J14	●	E
					L	GYHLUS20D00-M25L	●	GYM25LA-J14	●	E
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-J14	●	E
					L	GYHLUS24E00-M25L	●	GYM25LA-J14	●	E
		.984 ✶1	1.969 ✶2	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-J25	●	D
					L	GYHLUS12C00-M25L	●	GYM25LA-J25	●	D
				Mono Block	R	GYQRUS16D00-J25	●	—	—	G
					L	GYQLUS16D00-J25	●	—	—	G
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-J25	●	B
					L	GYHLUS16D00-M25L	●	GYM25LA-J25	●	B
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-J25	●	F
					L	GYHLUS20D00-M25L	●	GYM25LA-J25	●	F
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-J25	●	F
					L	GYHLUS24E00-M25L	●	GYM25LA-J25	●	F

✶1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : Inventory maintained.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/LUS○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/LUS○○○○○-M25R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (inch) ∗3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
.750	.750	4.764	1.299	2.139	.750	1.000	.250	R	
.750	.750	4.764	1.299	2.139	.750	1.000	.250		
1.000	1.000	5.764	1.299	2.013	1.000	1.125	—		
1.000	1.000	5.764	1.299	2.013	1.000	1.125	—		
1.000	1.000	6.000	1.614	—	1.000	1.014	—		
1.000	1.000	6.000	1.614	—	1.000	1.014	—		
1.250	1.250	5.764	1.299	2.021	1.250	1.375	—		
1.250	1.250	5.764	1.299	2.021	1.250	1.375	—		
1.500	1.500	6.764	1.299	2.005	1.500	1.625	—		
1.500	1.500	6.764	1.299	2.005	1.500	1.625	—		
.750	.750	5.000	1.535	2.375	.750	1.000	.250		
.750	.750	5.000	1.535	2.375	.750	1.000	.250		
1.000	1.000	6.000	1.535	2.249	1.000	1.125	—		
1.000	1.000	6.000	1.535	2.249	1.000	1.125	—		
1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
.750	.750	5.433	1.969	2.808	.750	1.000	.250	L	
.750	.750	5.433	1.969	2.808	.750	1.000	.250		
1.000	1.000	6.000	1.811	—	1.000	1.014	—		
1.000	1.000	6.000	1.811	—	1.000	1.014	—		
1.000	1.000	6.433	1.969	2.682	1.000	1.125	—		
1.000	1.000	6.433	1.969	2.682	1.000	1.125	—		
1.250	1.250	6.433	1.969	2.690	1.250	1.375	—		
1.250	1.250	6.433	1.969	2.690	1.250	1.375	—		
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—		
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—		

Select an Insert

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○−Breaker

For Grooving/Cutting off ➤ F013

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
J	.236", 6.00mm	●	●	●		
	.250", 6.35mm	●	●	●		

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
J	.236", 6.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.248", 6.31mm	●			
	.250", 6.35mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			

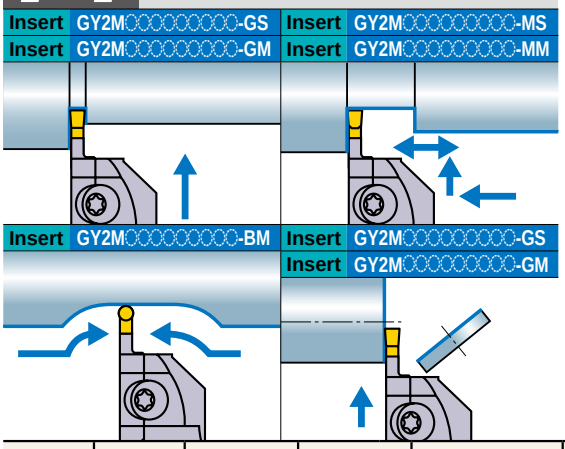
● : Gauge insert shown dimensions

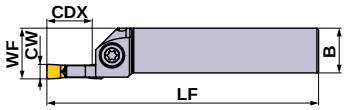
GROOVING

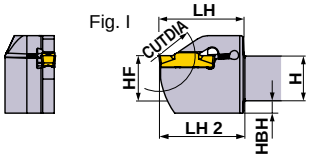
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

1-1 00° type holder (Inch)







Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
K	.315	⁎1 .984	⁎2 1.968	Mono Block	R	**GYPRUS16D00-K25**	●	—	—	I
					L	**GYPLUS16D00-K25**	●	—	—	I
				Mono Block	R	**GYPRUS20D00-K25**	●	—	—	K
					L	**GYPLUS20D00-K25**	●	—	—	K

⁎1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
⁎2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
⁎3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : **Inventory maintained.**

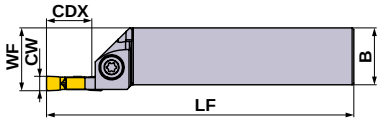
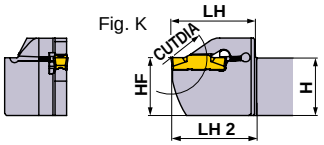


Fig. K



Right hand tool holder shown.

SPARE PARTS

Holder Number	Clamp Screw	Wrench
GYPR/LUS○○○00-K25	GY06013M (Clamp Torque : 53 lbf-in)	TKY30R

	Dimensions (inch) *3								Cutting Mode	
	H	**B**	**LF**	**LH**	**LH 2**	**HF**	**WF**	**HBH**	Clockwise	Anticlockwise
	1.000	1.000	6.000	1.850	1.875	1.000	1.161	.260	R	
	1.000	1.000	6.000	1.850	1.875	1.000	1.161	.260		
	1.250	1.250	7.000	1.850	2.875	1.250	1.377	—		
	1.250	1.250	7.000	1.850	2.875	1.250	1.377	—		
									L	

Select an Insert

Seat Size	Insert Number
K	**GY○○0800K○○○○–Breaker**

For Grooving/Cutting off ➤ F013

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
K	.315", 8.00mm		●	●		

For Multifunctional Grooving ➤ F014, F015

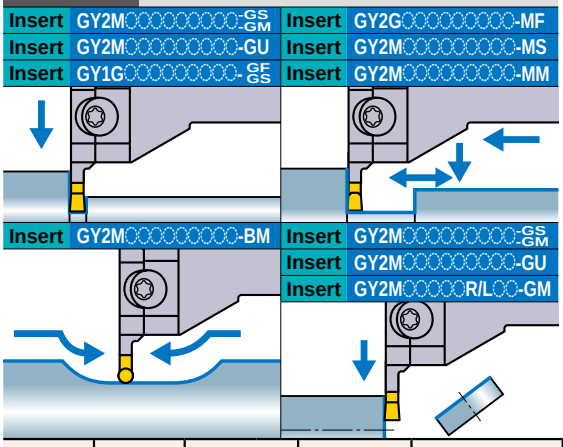
Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
K	.315", 8.00mm				●
	RE .031"		●	●	
	RE .047"			●	

● : Gauge insert shown dimensions

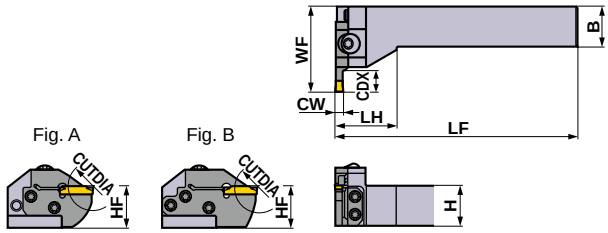
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

2-1 90° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
D	.079 .088	.236	.472	Modular	R	GYHRUS12C90-M20L	●	GYM20LA-D06	●	A
					L	GYHLUS12C90-M20R	●	GYM20RA-D06	●	A
				Modular	R	GYHRUS16D90-M25L	●	GYM25LA-D06	●	A
					L	GYHLUS16D90-M25R	●	GYM25RA-D06	●	A
		.394	.787	Modular	R	GYHRUS12C90-M20L	●	GYM20LA-D10	●	A
					L	GYHLUS12C90-M20R	●	GYM20RA-D10	●	A
		.472	.945	Modular	R	GYHRUS16D90-M25L	●	GYM25LA-D12	●	A
					L	GYHLUS16D90-M25R	●	GYM25RA-D12	●	A
		.709 ✶4	1.417	Modular	R	GYHRUS12C90-M20L	●	GYM20LB-D18	●	B
					L	GYHLUS12C90-M20R	●	GYM20RB-D18	●	B
		.787 ✶1	1.575 ✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LA-D20	●	B
					L	GYHLUS16D90-M25R	●	GYM25RA-D20	●	B
E	.094 .098 .108	.236	.472	Modular	R	GYHRUS12C90-M20L	●	GYM20LA-E06	●	A
					L	GYHLUS12C90-M20R	●	GYM20RA-E06	●	A
				Modular	R	GYHRUS16D90-M25L	●	GYM25LA-E06	●	A
					L	GYHLUS16D90-M25R	●	GYM25RA-E06	●	A
		.394	.787	Modular	R	GYHRUS12C90-M20L	●	GYM20LA-E10	●	A
					L	GYHLUS12C90-M20R	●	GYM20RA-E10	●	A
		.472	.945	Modular	R	GYHRUS16D90-M25L	●	GYM25LA-E12	●	A
					L	GYHLUS16D90-M25R	●	GYM25RA-E12	●	A
		.709 ✶4	1.417	Modular	R	GYHRUS12C90-M20L	●	GYM20LB-E18	●	B
					L	GYHLUS12C90-M20R	●	GYM20RB-E18	●	B
		.787 ✶1	1.575 ✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LA-E20	●	B
					L	GYHLUS16D90-M25R	●	GYM25RA-E20	●	B

✶1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
✶4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

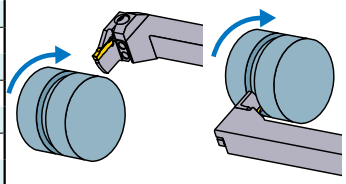
● : **Inventory maintained.**

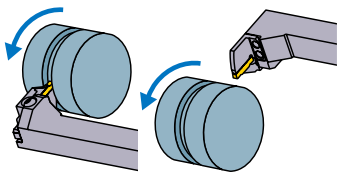
* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHRUS12C90-M20L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHLUS12C90-M20R			
GYHRUS16D90-M25L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

Dimensions (inch) *3						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
.750	.750	5.000	1.375	.750	1.545	**R**
.750	.750	5.000	1.375	.750	1.545	
1.000	1.000	6.000	1.500	1.000	1.779	
1.000	1.000	6.000	1.500	1.000	1.779	
.750	.750	5.000	1.375	.750	1.781	
.750	.750	5.000	1.375	.750	1.781	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
.750	.750	5.000	1.375	.750	2.017	
.750	.750	5.000	1.375	.750	2.017	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.330	
.750	.750	5.000	1.375	.750	1.545	**L**
.750	.750	5.000	1.375	.750	1.545	
1.000	1.000	6.000	1.500	1.000	1.779	
1.000	1.000	6.000	1.500	1.000	1.779	
.750	.750	5.000	1.375	.750	1.781	
.750	.750	5.000	1.375	.750	1.781	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
.750	.750	5.000	1.375	.750	2.017	
.750	.750	5.000	1.375	.750	2.017	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.330	





Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○−Breaker
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
D	.079", 2.00mm	●	●	●	●	●
E	.094", 2.39mm	●	●	●		●
	.098", 2.50mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

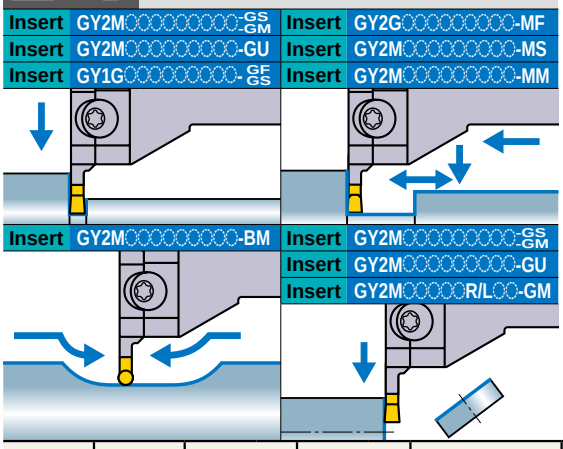
Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
D	.079", 2.00mm	●	●	●	●
	.088", 2.24mm	●			
E	.094", 2.39mm	●			
	.098", 2.50mm	●	●	●	●
	.108", 2.74mm	●			

● : Gauge insert shown dimensions

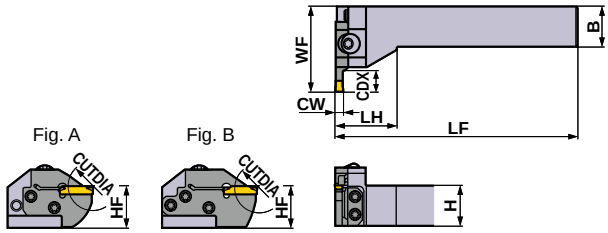
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

2-1 90° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	.118 .125 .128	.236	.472	Modular	R	GYHRUS12C90-M20L	●	GYM20LA-F06	●	A
					L	GYHLUS12C90-M20R	●	GYM20RA-F06	●	A
				Modular	R	GYHRUS16D90-M25L	●	GYM25LA-F06	●	A
					L	GYHLUS16D90-M25R	●	GYM25RA-F06	●	A
		.394	.787	Modular	R	GYHRUS12C90-M20L	●	GYM20LA-F10	●	A
					L	GYHLUS12C90-M20R	●	GYM20RA-F10	●	A
		.472	.945	Modular	R	GYHRUS16D90-M25L	●	GYM25LA-F12	●	A
					L	GYHLUS16D90-M25R	●	GYM25RA-F12	●	A
		.709 ✶4	1.417	Modular	R	GYHRUS12C90-M20L	●	GYM20LB-F18	●	B
					L	GYHLUS12C90-M20R	●	GYM20RB-F18	●	B
		.787 ✶1	1.575 ✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LA-F20	●	B
					L	GYHLUS16D90-M25R	●	GYM25RA-F20	●	B
G	.157 .167	.315	.630	Modular	R	GYHRUS16D90-M25L	●	GYM25LA-G08	●	A
					L	GYHLUS16D90-M25R	●	GYM25RA-G08	●	A
		.472	.945	Modular	R	GYHRUS12C90-M20L	●	GYM20LA-G12	●	A
					L	GYHLUS12C90-M20R	●	GYM20RA-G12	●	A
		.551	1.102	Modular	R	GYHRUS16D90-M25L	●	GYM25LA-G14	●	A
					L	GYHLUS16D90-M25R	●	GYM25RA-G14	●	A
		.984 ✶1	1.969 ✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LA-G25	●	B
					L	GYHLUS16D90-M25R	●	GYM25RA-G25	●	B

✶1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
✶4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

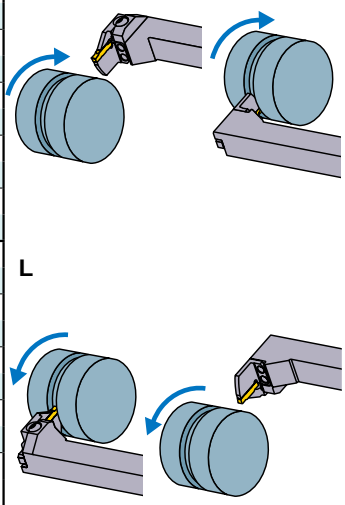
● : Inventory maintained.

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHRUS12C90-M20L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHLUS12C90-M20R			
GYHRUS16D90-M25L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

Dimensions (inch) *3						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
.750	.750	5.000	1.375	.750	1.545	**R**
.750	.750	5.000	1.375	.750	1.545	
1.000	1.000	6.000	1.500	1.000	1.779	
1.000	1.000	6.000	1.500	1.000	1.779	
.750	.750	5.000	1.375	.750	1.781	
.750	.750	5.000	1.375	.750	1.781	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
.750	.750	5.000	1.375	.750	2.017	
.750	.750	5.000	1.375	.750	2.017	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	1.857	**L**
1.000	1.000	6.000	1.500	1.000	1.857	
.750	.750	5.000	1.375	.750	1.781	
.750	.750	5.000	1.375	.750	1.781	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker
G	GY○○0400/0424G○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
F	.118", 3.00mm	●	●	●	●	●
	.125", 3.18mm	●	●	●		●
G	.157", 4.00mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

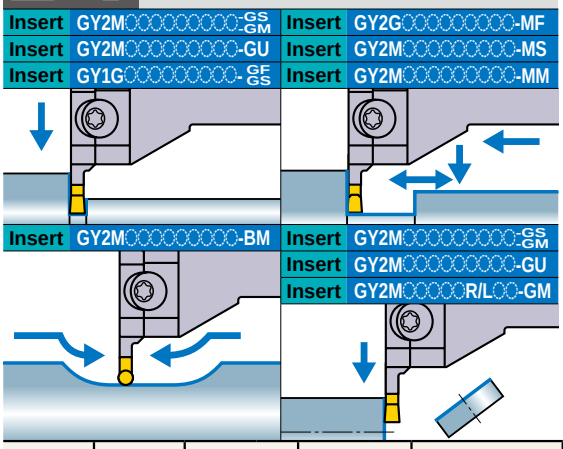
Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
F	.118", 3.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24mm	●			
G	.157", 4.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24mm	●			

● : Gauge insert shown dimensions

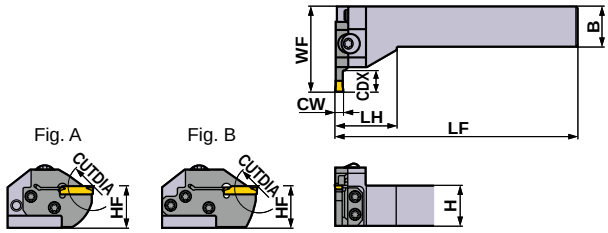
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

2-1 90° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	.187 .197 .206	.315	.630	Modular	R	**GYHRUS16D90-M25L**	●	**GYM25LA-H08**	●	A
					L	GYH**LUS16D90-M25R**	●	GYM**25RA-H08**	●	A
		.472	.945	Modular	R	GYH**RUS12C90-M20L**	●	GYM**20LA-H12**	●	A
					L	GYH**LUS12C90-M20R**	●	GYM**20RA-H12**	●	A
		.551	1.102	Modular	R	GYH**RUS16D90-M25L**	●	GYM**25LA-H14**	●	A
					L	GYH**LUS16D90-M25R**	●	GYM**25RA-H14**	●	A
		.984 ✶1	1.969 ✶2	Modular	R	GYH**RUS16D90-M25L**	●	GYM**25LA-H25**	●	B
					L	GYH**LUS16D90-M25R**	●	GYM**25RA-H25**	●	B
J	.236 .248 .250	.315	.630	Modular	R	**GYHRUS16D90-M25L**	●	**GYM25LA-J08**	●	A
					L	GYH**LUS16D90-M25R**	●	GYM**25RA-J08**	●	A
		.551	1.102	Modular	R	GYH**RUS16D90-M25L**	●	GYM**25LA-J14**	●	A
					L	GYH**LUS16D90-M25R**	●	GYM**25RA-J14**	●	A
		.984 ✶1	1.969 ✶2	Modular	R	GYH**RUS16D90-M25L**	●	GYM**25LA-J25**	●	B
					L	GYH**LUS16D90-M25R**	●	GYM**25RA-J25**	●	B

✶1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.

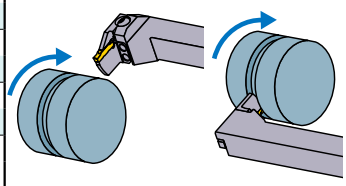
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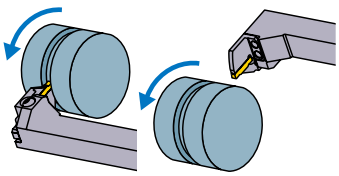
* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHRUS12C90-M20L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHLUS12C90-M20R			
GYHRUS16D90-M25L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

Dimensions (inch) *3						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
1.000	1.000	6.000	1.500	1.000	1.857	**R**
1.000	1.000	6.000	1.500	1.000	1.857	
.750	.750	5.000	1.375	.750	1.781	
.750	.750	5.000	1.375	.750	1.781	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	1.857	**L**
1.000	1.000	6.000	1.500	1.000	1.857	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	





Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○−Breaker
J	GY○○0600/0631/0635J○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
H	.187", 4.75mm	●	●	●		●
	.197", 5.00mm	●	●	●	●	●
J	.236", 6.00mm	●	●	●		
	.250", 6.35mm	●	●	●		

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
H	.187", 4.75mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24mm	●			
J	.236", 6.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.248", 6.31mm	●			
	.250", 6.35mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			

● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL RECESSING)

3-1 50° type holder (Inch) NEW

(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

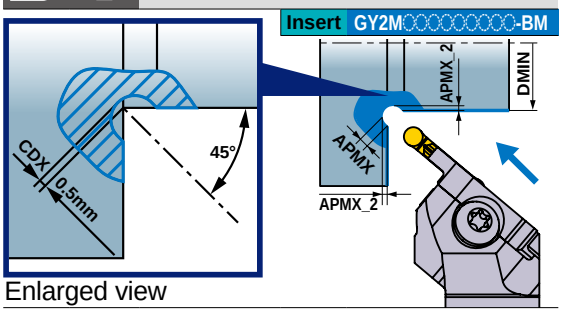
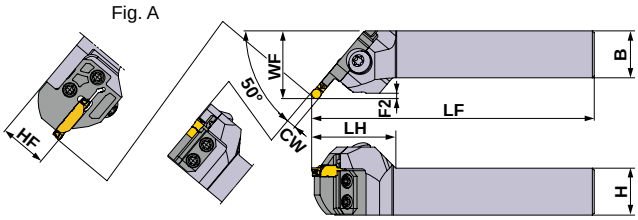


Fig. A



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	DMIN (inch)	APMX (inch)	APMX_2 (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
D	.079 .088	.020	1.181	.059	.025	Modular	R	GYHRUS12C50-M20L	●	GYM20LC-D005	●	A
							L	GYHLUS12C50-M20R	●	GYM20RC-D005	●	A
						Modular	R	GYHRUS16D50-M25L	●	GYM25LC-D005	●	A
							L	GYHLUS16D50-M25R	●	GYM25RC-D005	●	A
E	.094 .098 .108			.069	.028	Modular	R	GYHRUS12C50-M20L	●	GYM20LC-E005	●	A
							L	GYHLUS12C50-M20R	●	GYM20RC-E005	●	A
						Modular	R	GYHRUS16D50-M25L	●	GYM25LC-E005	●	A
							L	GYHLUS16D50-M25R	●	GYM25RC-E005	●	A
F	.118 .125 .128			.082	.032	Modular	R	GYHRUS12C50-M20L	●	GYM20LC-F005	●	A
							L	GYHLUS12C50-M20R	●	GYM20RC-F005	●	A
						Modular	R	GYHRUS16D50-M25L	●	GYM25LC-F005	●	A
							L	GYHLUS16D50-M25R	●	GYM25RC-F005	●	A
G	.157 .167			.098	.037	Modular	R	GYHRUS12C50-M20L	●	GYM20LC-G005	●	A
							L	GYHLUS12C50-M20R	●	GYM20RC-G005	●	A
						Modular	R	GYHRUS16D50-M25L	●	GYM25LC-G005	●	A
							L	GYHLUS16D50-M25R	●	GYM25RC-G005	●	A
H	.187 .197 .206		.787	.113	.041	Modular	R	GYHRUS12C50-M20L	●	GYM20LC-H005	●	A
							L	GYHLUS12C50-M20R	●	GYM20RC-H005	●	A
						Modular	R	GYHRUS16D50-M25L	●	GYM25LC-H005	●	A
							L	GYHLUS16D50-M25R	●	GYM25RC-H005	●	A
J	.236 .248 .250			.144	.051	Modular	R	GYHRUS16D50-M25L	●	GYM25LC-J005	●	A
							L	GYHLUS16D50-M25R	●	GYM25RC-J005	●	A

✶1 Blades for external and face grooving cannot be used since it interferes with work materials.
✶2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **WF** and **F2** values may vary.

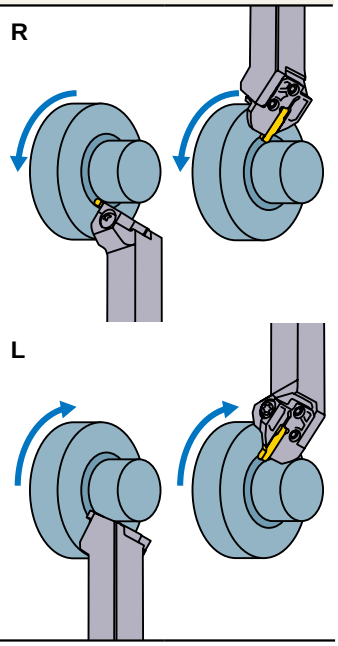
● : **Inventory maintained.**

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR/LUS12C50-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D50-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

	Dimensions (inch) *2							Cutting Mode
	H	**B**	**LF**	**LH**	**HF**	**WF**	**F2**	
	.750	.750	5.007	1.632	.750	1.232	.076	R
	.750	.750	5.007	1.632	.750	1.232	.076	
	1.000	1.000	6.007	1.819	1.000	1.357	.076	
	1.000	1.000	6.007	1.819	1.000	1.357	.076	
	.750	.750	5.003	1.628	.750	1.241	.084	
	.750	.750	5.003	1.628	.750	1.241	.084	
	1.000	1.000	6.003	1.815	1.000	1.366	.084	
	1.000	1.000	6.003	1.815	1.000	1.366	.084	
	.750	.750	5.000	1.625	.750	1.250	.094	
	.750	.750	5.000	1.625	.750	1.250	.094	
	1.000	1.000	6.000	1.813	1.000	1.375	.094	
	1.000	1.000	6.000	1.813	1.000	1.375	.094	
	.750	.750	4.989	1.614	.750	1.265	.109	L
	.750	.750	4.989	1.614	.750	1.265	.109	
	1.000	1.000	5.989	1.802	1.000	1.390	.109	
	1.000	1.000	5.989	1.802	1.000	1.390	.109	
	.750	.750	4.980	1.605	.750	1.281	.125	
	.750	.750	4.980	1.605	.750	1.281	.125	
	1.000	1.000	5.980	1.792	1.000	1.406	.125	
	1.000	1.000	5.980	1.792	1.000	1.406	.125	
	1.000	1.000	5.978	1.791	1.000	1.429	.148	
	1.000	1.000	5.978	1.791	1.000	1.429	.148	



Select an Insert

Insert Number
GY2M○○○○○○○○○N-BM

For Multifunctional Grooving ➤ **F015**

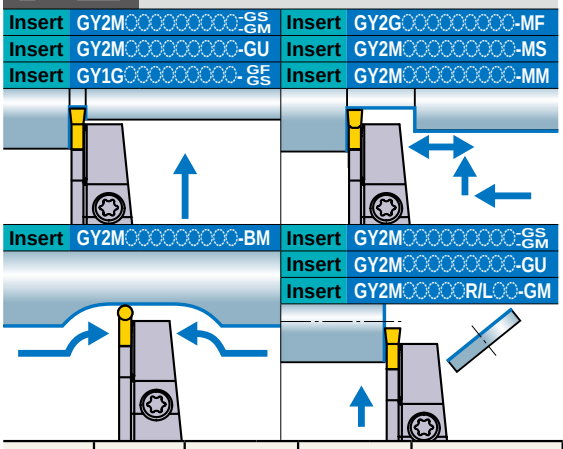
Seat Size	Breaker / CW	BM Ball nose
D	.079", 2.00mm	●
E	.098", 2.50mm	●
F	.118", 3.00mm	●
	.125", 3.18mm	●
G	.157", 4.00mm	●
H	.187", 4.75mm	●
	.197", 5.00mm	●
J	.236", 6.00mm	●
	.250", 6.35mm	●

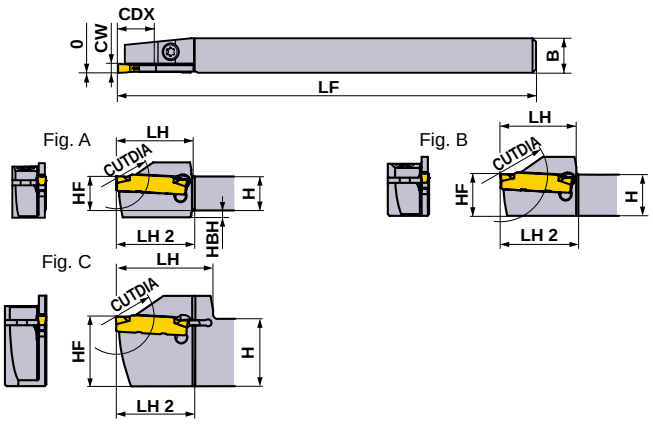
● : Gauge insert shown dimensions

IDENTIFICATION	➤ **F010, F011**
CUTTING CONDITIONS	➤ **F210**
INSTRUCTION MANUAL	➤ **F210**

GY SERIES (EXTERNAL GROOVING for Swiss style lathes)

1-2 00° type holder (Metric) NEW





Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm) ✶4	CUTDIA (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Fig.
C	1.50	11	22	Mono Block	R	GYSR1010JX00-C11	●	A
					L	GYSL1010JX00-C11	●	A
		13	26	Mono Block	R	GYSR1212JX00-C13	●	B
					L	GYSL1212JX00-C13	●	B
		17 ✶1	34 ✶2	Mono Block	R	GYSR1616JX00-C17	●	B
					L	GYSL1616JX00-C17	●	B
		18 ✶1	36 ✶2	Mono Block	R	GYSR2012JX00-C18	●	C
					L	GYSL2012JX00-C18	●	C
D	2.00 2.24	11	22	Mono Block	R	GYSR1010JX00-D11	●	A
					L	GYSL1010JX00-D11	●	A
		13	26	Mono Block	R	GYSR1212JX00-D13	●	B
					L	GYSL1212JX00-D13	●	B
		17	34	Mono Block	R	GYSR1616JX00-D17	●	B
					L	GYSL1616JX00-D17	●	B
		18	36	Mono Block	R	GYSR2012JX00-D18	●	C
					L	GYSL2012JX00-D18	●	C
E	2.39 2.50 2.74	11	22	Mono Block	R	GYSR1010JX00-E11	●	A
					L	GYSL1010JX00-E11	●	A
		13	26	Mono Block	R	GYSR1212JX00-E13	●	B
					L	GYSL1212JX00-E13	●	B
		17	34	Mono Block	R	GYSR1616JX00-E17	●	B
					L	GYSL1616JX00-E17	●	B
		18	36	Mono Block	R	GYSR2012JX00-E18	●	C
					L	GYSL2012JX00-E18	●	C
F	3.00 3.18 3.24	11	22	Mono Block	R	GYSR1010JX00-F11	●	A
					L	GYSL1010JX00-F11	●	A
		13	26	Mono Block	R	GYSR1212JX00-F13	●	B
					L	GYSL1212JX00-F13	●	B
		17	34	Mono Block	R	GYSR1616JX00-F17	●	B
					L	GYSL1616JX00-F17	●	B
		18	36	Mono Block	R	GYSR2012JX00-F18	●	C
					L	GYSL2012JX00-F18	●	C

✶1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
✶4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F208.

● : Inventory maintained.

SPARE PARTS

Holder Number	 Clamp Screw	 Wrench
GYSR/L1010JX00-◌11	CS350990T (Clamp Torque : 22 lbf-in)	TKY10R
GYSR/L1212JX00-◌13		
GYSR/L2012JX00-◌18		
GYSR/L1616JX00-◌17	TS4SBL (Clamp Torque : 31 lbf-in)	TKY15R

Dimensions (mm) *3							Cutting Mode	
H	**B**	**LF**	**LH**	**LH 2**	**HF**	**HBH**	Clockwise	Anticlockwise
10	10	120	22	16	10	2	R	
10	10	120	22	16	10	2		
12	12	120	22	16	12	—		
12	12	120	22	16	12	—		
16	16	120	27	17	16	—		
16	16	120	27	17	16	—		
20	12	120	28	16	20	—		
20	12	120	28	16	20	—		
10	10	120	22	23	10	2		
10	10	120	22	23	10	2		
12	12	120	22	23	12	—		
12	12	120	22	23	12	—		
16	16	120	27	24	16	—		
16	16	120	27	24	16	—		
20	12	120	28	23	20	—		
20	12	120	28	23	20	—		
10	10	120	22	23	10	2	L	
10	10	120	22	23	10	2		
12	12	120	22	23	12	—		
12	12	120	22	23	12	—		
16	16	120	27	24	16	—		
16	16	120	27	24	16	—		
20	12	120	28	23	20	—		
20	12	120	28	23	20	—		
10	10	120	22	23	10	2		
10	10	120	22	23	10	2		
12	12	120	22	23	12	—		
12	12	120	22	23	12	—		
16	16	120	27	24	16	—		
16	16	120	27	24	16	—		
20	12	120	28	23	20	—		
20	12	120	28	23	20	—		

Select an Insert

Seat Size	Insert Number
C	**GY◌◌0150C◌◌◌◌–Breaker**
D	**GY◌◌0200/0224D◌◌◌◌–Breaker**
E	**GY◌◌0239/0250/0274E◌◌◌◌–Breaker**
F	**GY◌◌0300/0318/0324F◌◌◌◌–Breaker**

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
C	.059", 1.50mm		●	●		
D	.079", 2.00mm	●	●	●	●	●
E	.094", 2.39mm	●	●	●		●
	.098", 2.50mm	●	●	●	●	●
F	.118", 3.00mm	●	●	●	●	●
	.125", 3.18mm	●	●	●		●

For Multifunctional Grooving ➤ F014, F015

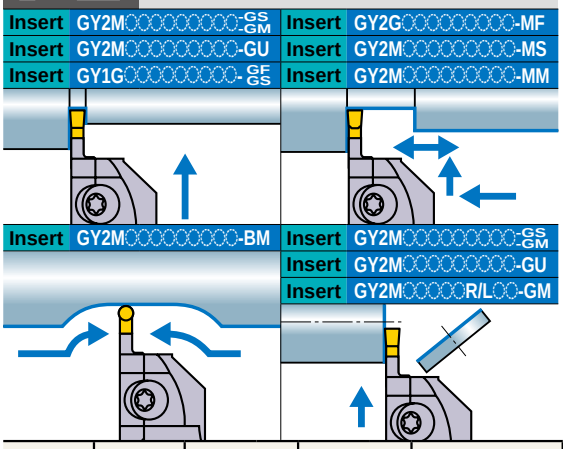
Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
D	.079", 2.00mm	●	●	●	●
	.088", 2.24mm	●			
E	.094", 2.39mm	●			
	.098", 2.50mm	●	●	●	●
	.108", 2.74mm	●			
F	.118", 3.00mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm			●	
	.125", 3.18mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	.128", 3.24mm	●			

● : Gauge insert shown dimensions

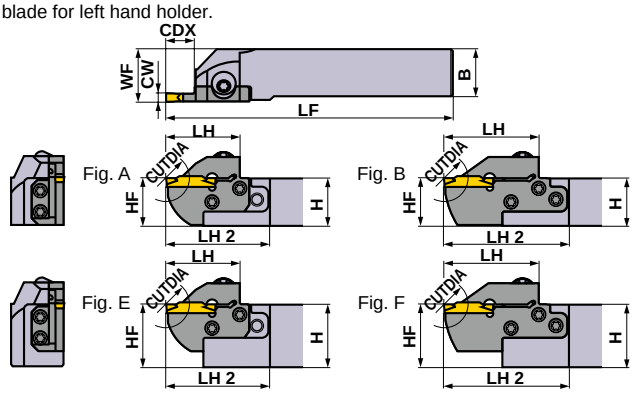
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F208

GY SERIES (EXTERNAL GROOVING)

1-2 00° type holder (Metric)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

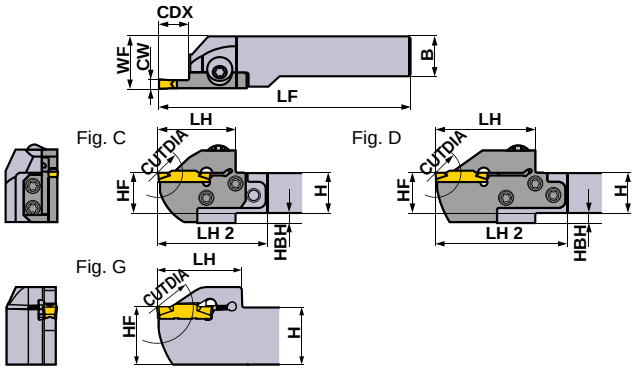


Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
D	2.00 2.24	6	12	Modular	R	GYHR1616J00-M20R	●	GYM20RA-D06	●	C
					L	GYHL1616J00-M20L	●	GYM20LA-D06	●	C
				NEW Mono Block	R	GYQR2020K00-D06	●	—	—	G
					L	GYQL2020K00-D06	●	—	—	G
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-D06	●	A
					L	GYHL2020K00-M20L	●	GYM20LA-D06	●	A
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-D06	●	C
					L	GYHL2020K00-M25L	●	GYM25LA-D06	●	C
				NEW Mono Block	R	GYQR2525M00-D06	●	—	—	G
					L	GYQL2525M00-D06	●	—	—	G
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-D06	●	A
					L	GYHL2525M00-M25L	●	GYM25LA-D06	●	A
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-D06	●	E
					L	GYHL3225P00-M25L	★	GYM25LA-D06	●	E
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-D06	●	E
					L	GYHL3232P00-M25L	★	GYM25LA-D06	●	E
		10	20	Modular	R	GYHR1616J00-M20R	●	GYM20RA-D10	●	C
					L	GYHL1616J00-M20L	●	GYM20LA-D10	●	C
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-D10	●	A
					L	GYHL2020K00-M20L	●	GYM20LA-D10	●	A
		12	24	Modular	R	GYHR2020K00-M25R	●	GYM25RA-D12	●	C
					L	GYHL2020K00-M25L	●	GYM25LA-D12	●	C
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-D12	●	A
					L	GYHL2525M00-M25L	●	GYM25LA-D12	●	A
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-D12	●	E
					L	GYHL3225P00-M25L	★	GYM25LA-D12	●	E
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-D12	●	E
					L	GYHL3232P00-M25L	★	GYM25LA-D12	●	E
		18 ★4	36	Modular	R	GYHR1616J00-M20R	●	GYM20RB-D18	●	D
					L	GYHL1616J00-M20L	●	GYM20LB-D18	●	D
				NEW Mono Block	R	GYQR2020K00-D18	●	—	—	G
					L	GYQL2020K00-D18	●	—	—	G
				Modular	R	GYHR2020K00-M20R	●	GYM20RB-D18	●	B
					L	GYHL2020K00-M20L	●	GYM20LB-D18	●	B
		20 ★1	40 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RA-D20	●	D
					L	GYHL2020K00-M25L	●	GYM25LA-D20	●	D
				NEW Mono Block	R	GYQR2525M00-D20	●	—	—	G
					L	GYQL2525M00-D20	●	—	—	G
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-D20	●	B
					L	GYHL2525M00-M25L	●	GYM25LA-D20	●	B
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-D20	●	F
					L	GYHL3225P00-M25L	★	GYM25LA-D20	●	F
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-D20	●	F
					L	GYHL3232P00-M25L	★	GYM25LA-D20	●	F

★1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
★2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
★3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.
★4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

● : Inventory maintained. ★ : Inventory maintained in Japan.



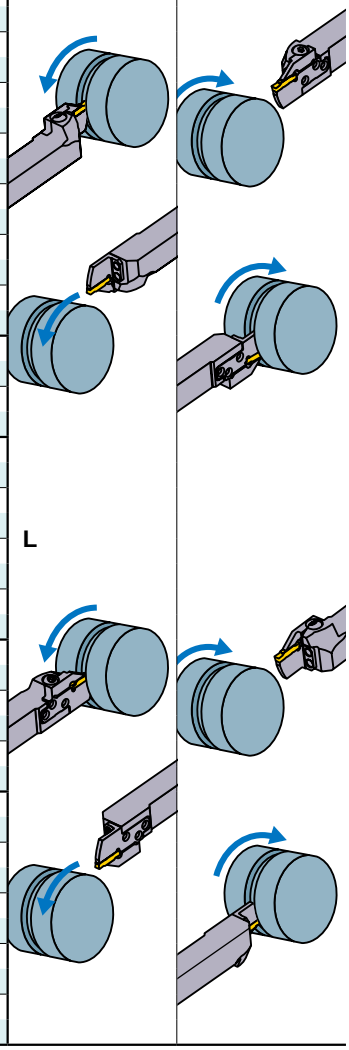
Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/L○○○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/L○○○○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/L○○○○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (mm) ∗3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
16	16	104	28	44	16	20	4	R	
16	16	104	28	44	16	20	4		
20	20	125	36	—	20	20.15	—		
20	20	125	36	—	20	20.15	—		
20	20	119	28	43	20	23	—		
20	20	119	28	43	20	23	—		
20	20	117	31	52	20	26	5		
20	20	117	31	52	20	26	5		
25	25	150	36	—	25	25.15	—		
25	25	150	36	—	25	25.15	—		
25	25	142	31	49	25	28	—		
25	25	142	31	49	25	28	—		
32	25	162	31	49	32	28	—		
32	25	162	31	49	32	28	—		
32	32	162	31	49	32	35	—		
32	32	162	31	49	32	35	—		
16	16	110	34	50	16	20	4		
16	16	110	34	50	16	20	4		
20	20	125	34	49	20	23	—		
20	20	125	34	49	20	23	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—	L	
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
16	16	116	40	56	16	20	4		
16	16	116	40	56	16	20	4		
20	20	125	39	—	20	20.10	—		
20	20	125	39	—	20	20.10	—		
20	20	131	40	55	20	23	—		
20	20	131	40	55	20	23	—		
20	20	131	45	66	20	26	5		
20	20	131	45	66	20	26	5		
25	25	150	41	—	25	25.10	—		
25	25	150	41	—	25	25.10	—		
25	25	156	45	63	25	28	—		
25	25	156	45	63	25	28	—		
32	25	176	45	63	32	28	—		
32	25	176	45	63	32	28	—		
32	32	176	45	63	32	35	—		
32	32	176	45	63	32	35	—		



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
D	.079", 2.00mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
D	.079", 2.00mm	●	●	●	●
	.088", 2.24mm	●			

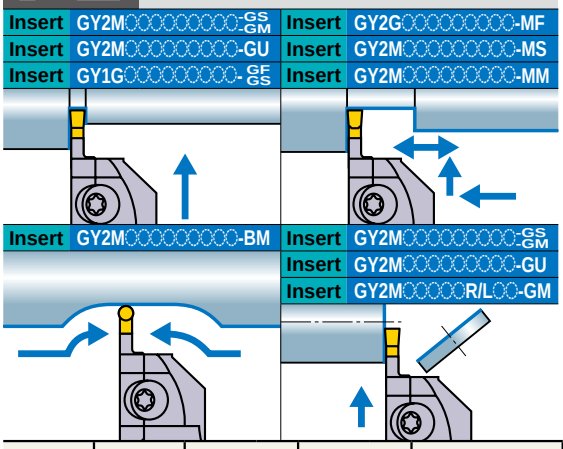
● : Gauge insert shown dimensions

GROOVING

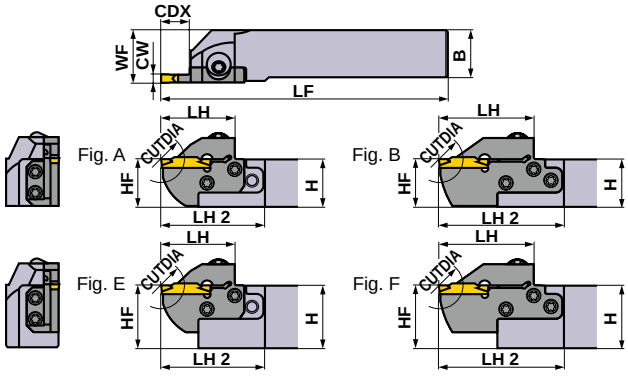
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

1-2 00° type holder (Metric)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

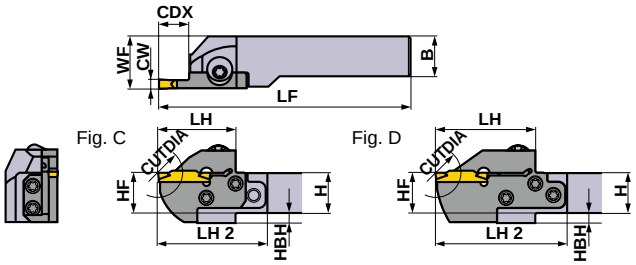


Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
E	2.39 2.50 2.74	6	12	Modular	R	GYHR1616J00-M20R	●	GYM20RA-E06	●	C
					L	GYHL1616J00-M20L	●	GYM20LA-E06	●	C
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-E06	●	A
					L	GYHL2020K00-M20L	●	GYM20LA-E06	●	A
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-E06	●	C
					L	GYHL2020K00-M25L	●	GYM25LA-E06	●	C
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-E06	●	A
					L	GYHL2525M00-M25L	●	GYM25LA-E06	●	A
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-E06	●	E
					L	GYHL3225P00-M25L	★	GYM25LA-E06	●	E
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-E06	●	E
					L	GYHL3232P00-M25L	★	GYM25LA-E06	●	E
		10	20	Modular	R	GYHR1616J00-M20R	●	GYM20RA-E10	●	C
					L	GYHL1616J00-M20L	●	GYM20LA-E10	●	C
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-E10	●	A
					L	GYHL2020K00-M20L	●	GYM20LA-E10	●	A
		12	24	Modular	R	GYHR2020K00-M25R	●	GYM25RA-E12	●	C
					L	GYHL2020K00-M25L	●	GYM25LA-E12	●	C
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-E12	●	A
					L	GYHL2525M00-M25L	●	GYM25LA-E12	●	A
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-E12	●	E
					L	GYHL3225P00-M25L	★	GYM25LA-E12	●	E
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-E12	●	E
					L	GYHL3232P00-M25L	★	GYM25LA-E12	●	E
		18 ★4	36	Modular	R	GYHR1616J00-M20R	●	GYM20RB-E18	●	D
					L	GYHL1616J00-M20L	●	GYM20LB-E18	●	D
				Modular	R	GYHR2020K00-M20R	●	GYM20RB-E18	●	B
					L	GYHL2020K00-M20L	●	GYM20LB-E18	●	B
		20 ★1	40 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RA-E20	●	D
					L	GYHL2020K00-M25L	●	GYM25LA-E20	●	D
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-E20	●	B
					L	GYHL2525M00-M25L	●	GYM25LA-E20	●	B
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-E20	●	F
					L	GYHL3225P00-M25L	★	GYM25LA-E20	●	F
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-E20	●	F
					L	GYHL3232P00-M25L	★	GYM25LA-E20	●	F

★1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
★2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
★3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.
★4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

● : Inventory maintained. ★ : Inventory maintained in Japan.



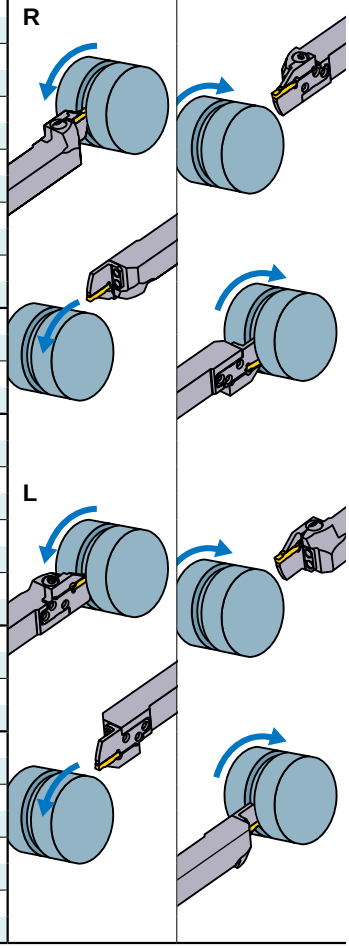
Right hand tool holder shown.

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench *
GYQR/L○○○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/L○○○○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/L○○○○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (mm) *3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
16	16	104	28	44	16	20	4	R	
16	16	104	28	44	16	20	4		
20	20	119	28	43	20	23	—		
20	20	119	28	43	20	23	—		
20	20	117	31	52	20	26	5		
20	20	117	31	52	20	26	5		
25	25	142	31	49	25	28	—		
25	25	142	31	49	25	28	—		
32	25	162	31	49	32	28	—		
32	25	162	31	49	32	28	—		
32	32	162	31	49	32	35	—		
32	32	162	31	49	32	35	—		
16	16	110	34	50	16	20	4		
16	16	110	34	50	16	20	4		
20	20	125	34	49	20	23	—		
20	20	125	34	49	20	23	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
16	16	116	40	56	16	20	4		
16	16	116	40	56	16	20	4		
20	20	131	40	55	20	23	—		
20	20	131	40	55	20	23	—		
20	20	131	45	66	20	26	5		
20	20	131	45	66	20	26	5		
25	25	156	45	63	25	28	—		
25	25	156	45	63	25	28	—		
32	25	176	45	63	32	28	—		
32	25	176	45	63	32	28	—		
32	32	176	45	63	32	35	—		
32	32	176	45	63	32	35	—		



Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU Neutral	GS Neutral	GM Neutral	05-GM Hand	GFGS Neutral
E	.094", 2.39mm	●	●	●		●
	.098", 2.50mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM Ball nose
E	.094", 2.39mm	●			
	.098", 2.50mm	●	●	●	●
	.108", 2.74mm	●			

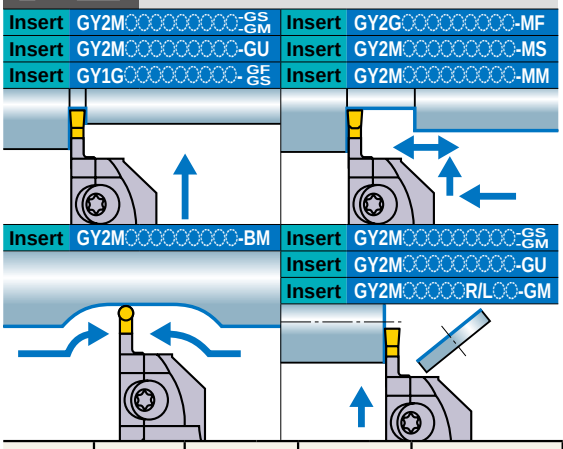
● : Gauge insert shown dimensions

GROOVING

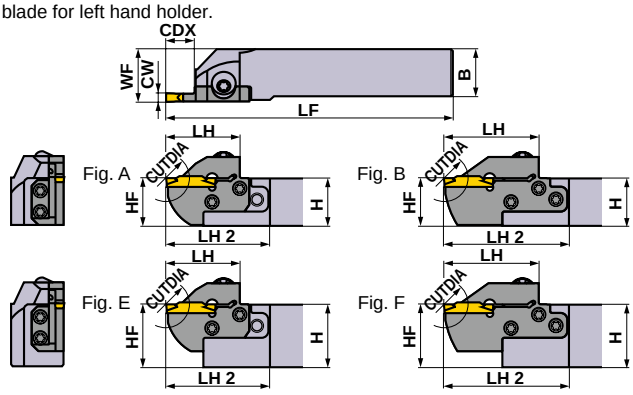
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

1-2 00° type holder (Metric)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

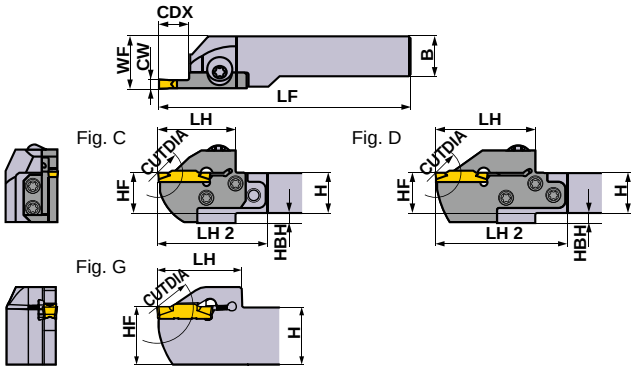


Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	6	12	Modular	R	GYHR1616J00-M20R	●	GYM20RA-F06	●	C
					L	GYHL1616J00-M20L	●	GYM20LA-F06	●	C
				NEW Mono Block	R	GYQR2020K00-F06	●	—	—	G
					L	GYQL2020K00-F06	●	—	—	G
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-F06	●	A
					L	GYHL2020K00-M20L	●	GYM20LA-F06	●	A
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-F06	●	C
					L	GYHL2020K00-M25L	●	GYM25LA-F06	●	C
				NEW Mono Block	R	GYQR2525M00-F06	●	—	—	G
					L	GYQL2525M00-F06	●	—	—	G
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-F06	●	A
					L	GYHL2525M00-M25L	●	GYM25LA-F06	●	A
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-F06	●	E
					L	GYHL3225P00-M25L	★	GYM25LA-F06	●	E
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-F06	●	E
					L	GYHL3232P00-M25L	★	GYM25LA-F06	●	E
		10	20	Modular	R	GYHR1616J00-M20R	●	GYM20RA-F10	●	C
					L	GYHL1616J00-M20L	●	GYM20LA-F10	●	C
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-F10	●	A
					L	GYHL2020K00-M20L	●	GYM20LA-F10	●	A
		12	24	Modular	R	GYHR2020K00-M25R	●	GYM25RA-F12	●	C
					L	GYHL2020K00-M25L	●	GYM25LA-F12	●	C
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-F12	●	A
					L	GYHL2525M00-M25L	●	GYM25LA-F12	●	A
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-F12	●	E
					L	GYHL3225P00-M25L	★	GYM25LA-F12	●	E
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-F12	●	E
					L	GYHL3232P00-M25L	★	GYM25LA-F12	●	E
		18 ★4	36	Modular	R	GYHR1616J00-M20R	●	GYM20RB-F18	●	D
					L	GYHL1616J00-M20L	●	GYM20LB-F18	●	D
				NEW Mono Block	R	GYQR2020K00-F18	●	—	—	G
					L	GYQL2020K00-F18	●	—	—	G
				Modular	R	GYHR2020K00-M20R	●	GYM20RB-F18	●	B
					L	GYHL2020K00-M20L	●	GYM20LB-F18	●	B
		20 ★1	40 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RA-F20	●	D
					L	GYHL2020K00-M25L	●	GYM25LA-F20	●	D
				NEW Mono Block	R	GYQR2525M00-F20	●	—	—	G
					L	GYQL2525M00-F20	●	—	—	G
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-F20	●	B
					L	GYHL2525M00-M25L	●	GYM25LA-F20	●	B
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-F20	●	F
					L	GYHL3225P00-M25L	★	GYM25LA-F20	●	F
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-F20	●	F
					L	GYHL3232P00-M25L	★	GYM25LA-F20	●	F

★1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
★2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
★3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.
★4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

● : Inventory maintained. ★ : Inventory maintained in Japan.



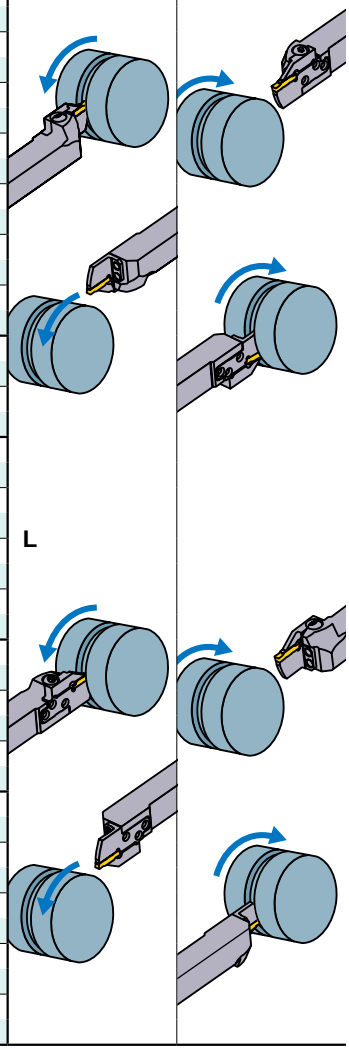
Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/L○○○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/L○○○○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/L○○○○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (mm) ∗3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
16	16	104	28	44	16	20	4	R	
16	16	104	28	44	16	20	4		
20	20	125	36	—	20	20.30	—		
20	20	125	36	—	20	20.30	—		
20	20	119	28	43	20	23	—		
20	20	119	28	43	20	23	—		
20	20	117	31	52	20	26	5		
20	20	117	31	52	20	26	5		
25	25	150	36	—	25	25.30	—		
25	25	150	36	—	25	25.30	—		
25	25	142	31	49	25	28	—		
25	25	142	31	49	25	28	—		
32	25	162	31	49	32	28	—		
32	25	162	31	49	32	28	—		
32	32	162	31	49	32	35	—		
32	32	162	31	49	32	35	—		
16	16	110	34	50	16	20	4		
16	16	110	34	50	16	20	4		
20	20	125	34	49	20	23	—		
20	20	125	34	49	20	23	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
16	16	116	40	56	16	20	4	L	
16	16	116	40	56	16	20	4		
20	20	125	39	—	20	20.25	—		
20	20	125	39	—	20	20.25	—		
20	20	131	40	55	20	23	—		
20	20	131	40	55	20	23	—		
20	20	131	45	66	20	26	5		
20	20	131	45	66	20	26	5		
25	25	150	41	—	25	25.25	—		
25	25	150	41	—	25	25.25	—		
25	25	156	45	63	25	28	—		
25	25	156	45	63	25	28	—		
32	25	176	45	63	32	28	—		
32	25	176	45	63	32	28	—		
32	32	176	45	63	32	35	—		
32	32	176	45	63	32	35	—		



Select an Insert

Seat Size	Insert Number
F	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
F	.118", 3.00mm	●	●	●	●	●
	.125", 3.18mm	●	●	●		●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
F	.118", 3.00mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm			●	
	.125", 3.18mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	.128", 3.24mm	●			

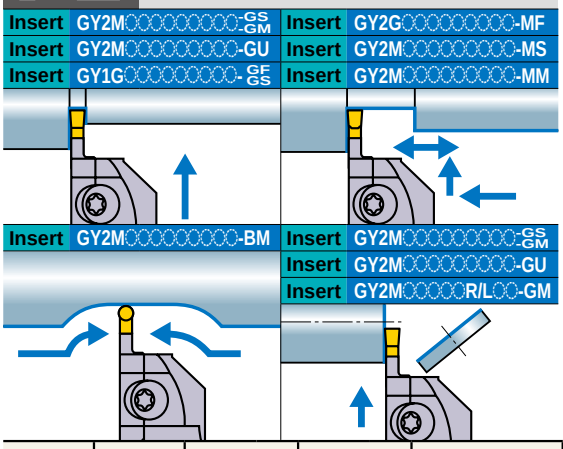
● : Gauge insert shown dimensions

GROOVING

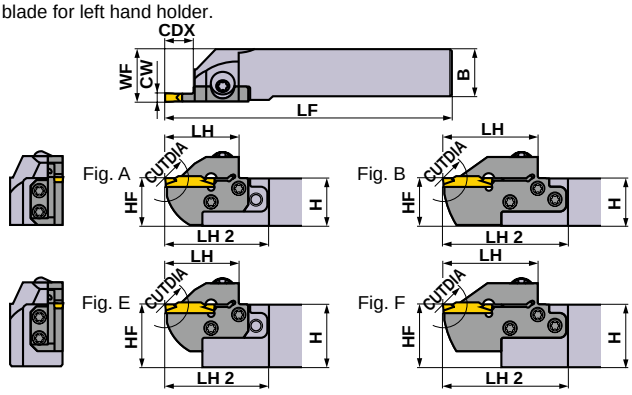
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

1-2 00° type holder (Metric)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

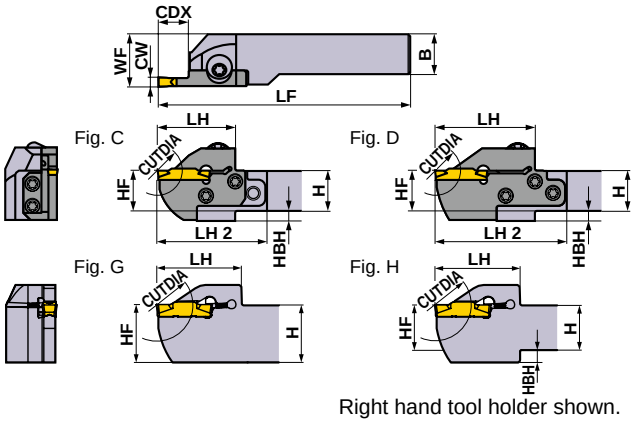


Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
G	4.00 4.24	8	16	NEW Mono Block	R	GYQR2020K00-G08	●	—	—	G
					L	GYQL2020K00-G08	●	—	—	G
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-G08	●	C
					L	GYHL2020K00-M25L	●	GYM25LA-G08	●	C
				NEW Mono Block	R	GYQR2525M00-G08	●	—	—	G
					L	GYQL2525M00-G08	●	—	—	G
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-G08	●	A
					L	GYHL2525M00-M25L	●	GYM25LA-G08	●	A
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-G08	●	E
					L	GYHL3225P00-M25L	★	GYM25LA-G08	●	E
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-G08	●	E
					L	GYHL3232P00-M25L	★	GYM25LA-G08	●	E
		12	24	Modular	R	GYHR1616J00-M20R	●	GYM20RA-G12	●	C
					L	GYHL1616J00-M20L	●	GYM20LA-G12	●	C
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-G12	●	A
					L	GYHL2020K00-M20L	●	GYM20LA-G12	●	A
		14	28	Modular	R	GYHR2020K00-M25R	●	GYM25RA-G14	●	C
					L	GYHL2020K00-M25L	●	GYM25LA-G14	●	C
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-G14	●	A
					L	GYHL2525M00-M25L	●	GYM25LA-G14	●	A
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-G14	●	E
					L	GYHL3225P00-M25L	★	GYM25LA-G14	●	E
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-G14	●	E
					L	GYHL3232P00-M25L	★	GYM25LA-G14	●	E
		25 ★1	50 ★2	NEW Mono Block	R	GYQR2020K00-G25	●	—	—	H
					L	GYQL2020K00-G25	●	—	—	H
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-G25	●	D
					L	GYHL2020K00-M25L	●	GYM25LA-G25	●	D
				NEW Mono Block	R	GYQR2525M00-G25	●	—	—	G
					L	GYQL2525M00-G25	●	—	—	G
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-G25	●	B
					L	GYHL2525M00-M25L	●	GYM25LA-G25	●	B
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-G25	●	F
					L	GYHL3225P00-M25L	★	GYM25LA-G25	●	F
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-G25	●	F
					L	GYHL3232P00-M25L	★	GYM25LA-G25	●	F

★1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
★2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
★3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : Inventory maintained. ★ : Inventory maintained in Japan.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	①② Clamp Screw	5 pcs. Blade Screw	①② Wrench ∗
GYQR/L○○○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/L○○○○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/L○○○○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (mm) ∗3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
20	20	125	41	—	20	20.35	—	R	
20	20	125	41	—	20	20.35	—		
20	20	119	33	54	20	26	5		
20	20	119	33	54	20	26	5		
25	25	150	41	—	25	25.35	—		
25	25	150	41	—	25	25.35	—		
25	25	144	33	51	25	28	—		
25	25	144	33	51	25	28	—		
32	25	164	33	51	32	28	—		
32	25	164	33	51	32	28	—		
32	32	164	33	51	32	35	—		
32	32	164	33	51	32	35	—		
16	16	110	34	50	16	20	4		
16	16	110	34	50	16	20	4		
20	20	125	34	49	20	23	—		
20	20	125	34	49	20	23	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	125	46	—	20	20.35	4	L	
20	20	125	46	—	20	20.35	4		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	150	46	—	25	25.35	—		
25	25	150	46	—	25	25.35	—		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		

Select an Insert

Seat Size	Insert Number
G	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
G	.157", 4.00mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
G	.157", 4.00mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm	●		●	
	.167", 4.24mm	●			

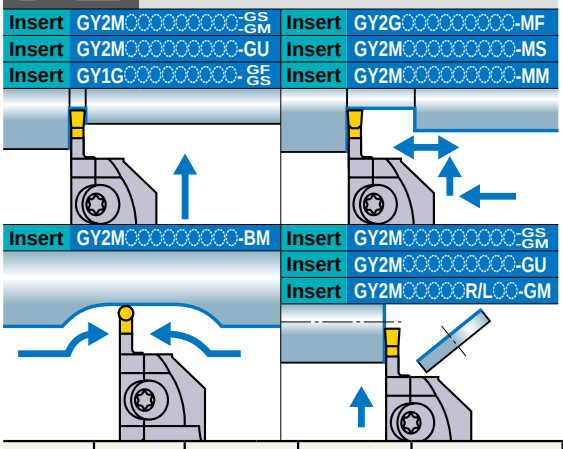
● : Gauge insert shown dimensions

GROOVING

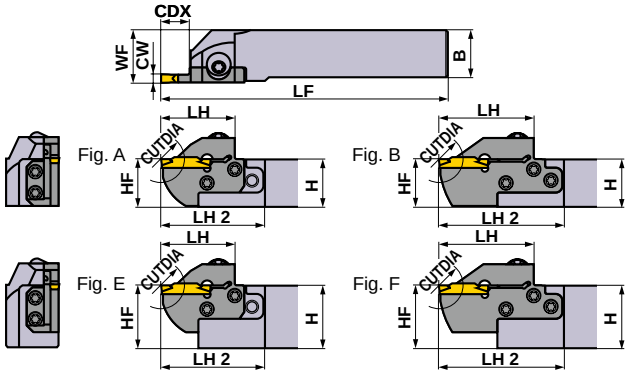
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

1-2 00° type holder (Metric)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

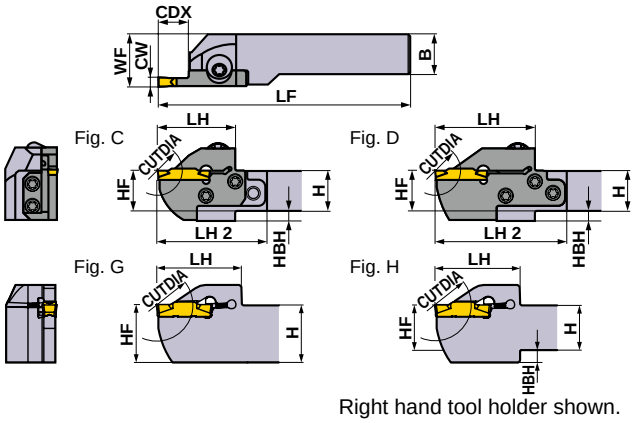


Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	8	16	NEW Mono Block	R	GYQR2020K00-H08	●	—	—	G
					L	GYQL2020K00-H08	●	—	—	G
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-H08	●	C
					L	GYHL2020K00-M25L	●	GYM25LA-H08	●	C
				NEW Mono Block	R	GYQR2525M00-H08	●	—	—	G
					L	GYQL2525M00-H08	●	—	—	G
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-H08	●	A
					L	GYHL2525M00-M25L	●	GYM25LA-H08	●	A
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-H08	●	E
					L	GYHL3225P00-M25L	★	GYM25LA-H08	●	E
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-H08	●	E
					L	GYHL3232P00-M25L	★	GYM25LA-H08	●	E
		12	24	Modular	R	GYHR1616J00-M20R	●	GYM20RA-H12	●	C
					L	GYHL1616J00-M20L	●	GYM20LA-H12	●	C
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-H12	●	A
					L	GYHL2020K00-M20L	●	GYM20LA-H12	●	A
		14	28	Modular	R	GYHR2020K00-M25R	●	GYM25RA-H14	●	C
					L	GYHL2020K00-M25L	●	GYM25LA-H14	●	C
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-H14	●	A
					L	GYHL2525M00-M25L	●	GYM25LA-H14	●	A
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-H14	●	E
					L	GYHL3225P00-M25L	★	GYM25LA-H14	●	E
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-H14	●	E
					L	GYHL3232P00-M25L	★	GYM25LA-H14	●	E
		25 ✶1	50 ✶2	NEW Mono Block	R	GYQR2020K00-H25	●	—	—	H
					L	GYQL2020K00-H25	●	—	—	H
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-H25	●	D
					L	GYHL2020K00-M25L	●	GYM25LA-H25	●	D
				NEW Mono Block	R	GYQR2525M00-H25	●	—	—	G
					L	GYQL2525M00-H25	●	—	—	G
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-H25	●	B
					L	GYHL2525M00-M25L	●	GYM25LA-H25	●	B
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-H25	●	F
					L	GYHL3225P00-M25L	★	GYM25LA-H25	●	F
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-H25	●	F
					L	GYHL3232P00-M25L	★	GYM25LA-H25	●	F

✶1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : Inventory maintained. ★ : Inventory maintained in Japan.

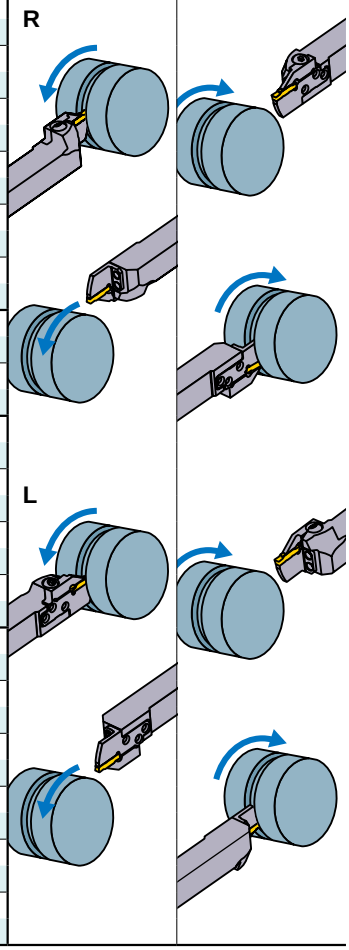


∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/L○○○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/L○○○○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/L○○○○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (mm) ∗3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
20	20	125	41	—	20	20.35	—	R	
20	20	125	41	—	20	20.35	—		
20	20	119	33	54	20	26	5		
20	20	119	33	54	20	26	5		
25	25	150	41	—	25	25.35	—		
25	25	150	41	—	25	25.35	—		
25	25	144	33	51	25	28	—		
25	25	144	33	51	25	28	—		
32	25	164	33	51	32	28	—		
32	25	164	33	51	32	28	—		
32	32	164	33	51	32	35	—		
32	32	164	33	51	32	35	—		
16	16	110	34	50	16	20	4		
16	16	110	34	50	16	20	4		
20	20	125	34	49	20	23	—		
20	20	125	34	49	20	23	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	125	46	—	20	20.35	4		
20	20	125	46	—	20	20.35	4		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	150	46	—	25	25.35	—		
25	25	150	46	—	25	25.35	—		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU Neutral	GS Neutral	GM Neutral	05-GM Hand	GFGS Neutral
H	.187", 4.75mm	●	●	●		●
	.197", 5.00mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM Ball nose
H	.187", 4.75mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	RE 0.8mm	●			
	.197", 5.00mm				●
	RE 0.2mm	●			
	RE 0.4mm	●	●	●	
	RE 0.8mm	●	●	●	
	.206", 5.24mm	●			

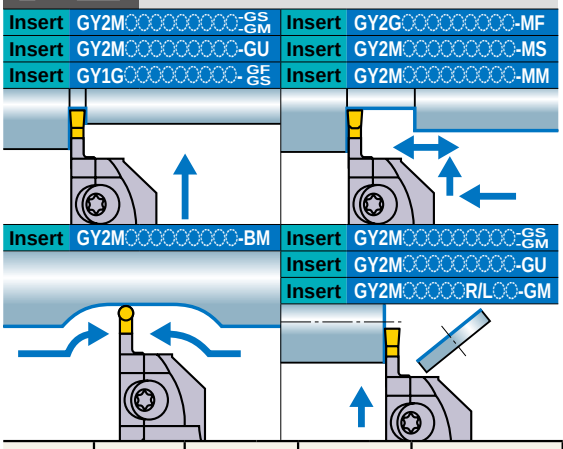
● : Gauge insert shown dimensions

GROOVING

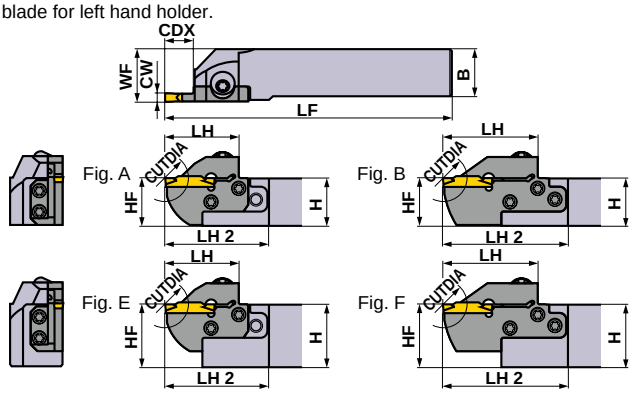
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

1-2 00° type holder (Metric)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

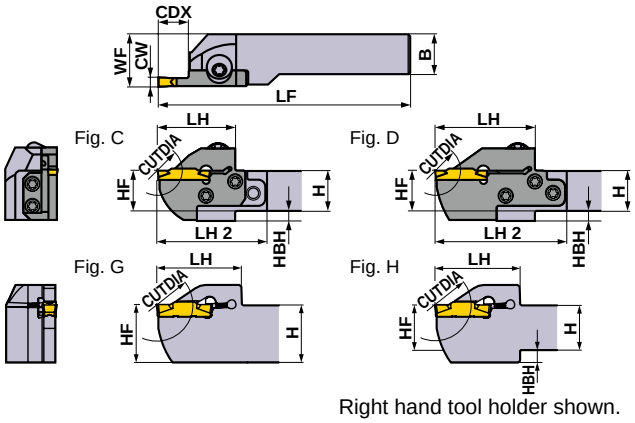


Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
J	6.00 6.31 6.35	8	16	NEW Mono Block	R	GYQR2020K00-J08	●	—	—	G
					L	GYQL2020K00-J08	●	—	—	G
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-J08	●	C
					L	GYHL2020K00-M25L	●	GYM25LA-J08	●	C
				NEW Mono Block	R	GYQR2525M00-J08	●	—	—	G
					L	GYQL2525M00-J08	●	—	—	G
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-J08	●	A
					L	GYHL2525M00-M25L	●	GYM25LA-J08	●	A
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-J08	●	E
					L	GYHL3225P00-M25L	★	GYM25LA-J08	●	E
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-J08	●	E
					L	GYHL3232P00-M25L	★	GYM25LA-J08	●	E
		14	28	Modular	R	GYHR2020K00-M25R	●	GYM25RA-J14	●	C
					L	GYHL2020K00-M25L	●	GYM25LA-J14	●	C
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-J14	●	A
					L	GYHL2525M00-M25L	●	GYM25LA-J14	●	A
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-J14	●	E
					L	GYHL3225P00-M25L	★	GYM25LA-J14	●	E
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-J14	●	E
					L	GYHL3232P00-M25L	★	GYM25LA-J14	●	E
		25 ★1	50 ★2	NEW Mono Block	R	GYQR2020K00-J25	●	—	—	H
					L	GYQL2020K00-J25	●	—	—	H
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-J25	●	D
					L	GYHL2020K00-M25L	●	GYM25LA-J25	●	D
				NEW Mono Block	R	GYQR2525M00-J25	●	—	—	G
					L	GYQL2525M00-J25	●	—	—	G
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-J25	●	B
					L	GYHL2525M00-M25L	●	GYM25LA-J25	●	B
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-J25	●	F
					L	GYHL3225P00-M25L	★	GYM25LA-J25	●	F
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-J25	●	F
					L	GYHL3232P00-M25L	★	GYM25LA-J25	●	F

★1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
★2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
★3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : Inventory maintained. ★ : Inventory maintained in Japan.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/L○○○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/L○○○○○○○○-M25R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (mm) ∗3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
20	20	125	41	—	20	20.35	—	R	
20	20	125	41	—	20	20.35	—		
20	20	119	33	54	20	26	5		
20	20	119	33	54	20	26	5		
25	25	150	41	—	25	25.35	—		
25	25	150	41	—	25	25.35	—		
25	25	144	33	51	25	28	—		
25	25	144	33	51	25	28	—		
32	25	164	33	51	32	28	—		
32	25	164	33	51	32	28	—		
32	32	164	33	51	32	35	—		
32	32	164	33	51	32	35	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	125	46	—	20	20.35	4	L	
20	20	125	46	—	20	20.35	4		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	150	46	—	25	25.35	—		
25	25	150	46	—	25	25.35	—		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		

Select an Insert

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○−Breaker

For Grooving/Cutting off ➤ F013

Seat Size	Breaker / CW	GU Neutral	GS Neutral	GM Neutral	05-GM Hand	GFGS Neutral
J	.236", 6.00mm	●	●	●		
	.250", 6.35mm	●	●	●		

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM Ball nose
J	.236", 6.00mm				●
	RE 0.2mm	●			
	RE 0.4mm	●	●	●	
	RE 0.8mm	●	●	●	
	.248", 6.31mm	●			
	.250", 6.35mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	RE 0.8mm	●			

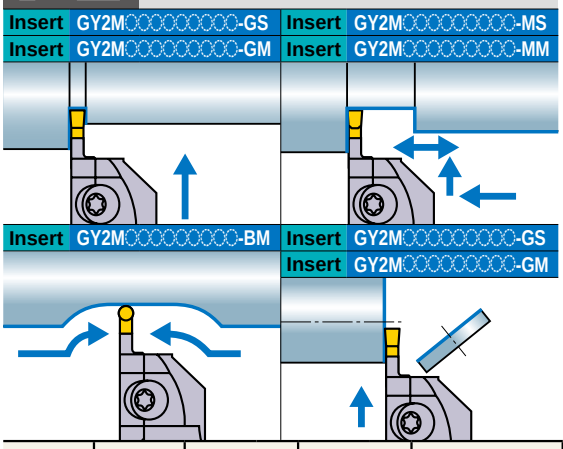
● : Gauge insert shown dimensions

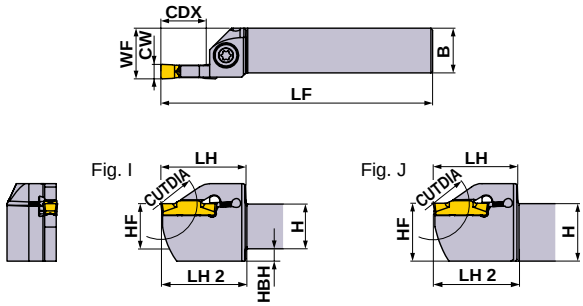
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

1-2 00° type holder (Metric)





Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
K	8.00	25 ✱1	50 ✱2	Mono Block	R	GYPR2525M00-K25	●	—	—	I
					L	GYPL2525M00-K25	●	—	—	I
				Mono Block	R	GYPR3225P00-K25	●	—	—	J
					L	GYPL3225P00-K25	●	—	—	J
				Mono Block	R	GYPR3232P00-K25	●	—	—	K
					L	GYPL3232P00-K25	●	—	—	K

✱1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
✱2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
✱3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : **Inventory maintained.**

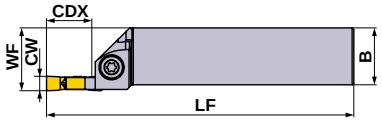
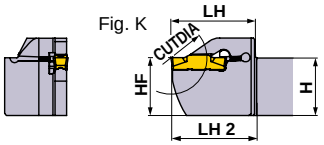


Fig. K



Right hand tool holder shown.

SPARE PARTS

Holder Number	Clamp Screw	Wrench
GYPR/L○○○○○00-K25	GY06013M (Clamp Torque : 53 lbf-in)	TKY30R

	Dimensions (mm) *3								Cutting Mode	
	H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
	25	25	150	47	48	25	28	7	R	
	25	25	150	47	48	25	28	7		
	32	25	170	47	48	32	28	—		
	32	25	170	47	48	32	28	—		
	32	32	170	47	48	32	35	—		
	32	32	170	47	48	32	35	—		
									L	

Select an Insert

Seat Size	Insert Number
K	GY○○0800K○○○○–Breaker

For Grooving/Cutting off ➤ F013

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
K	.315", 8.00mm		●	●		

For Multifunctional Grooving ➤ F014, F015

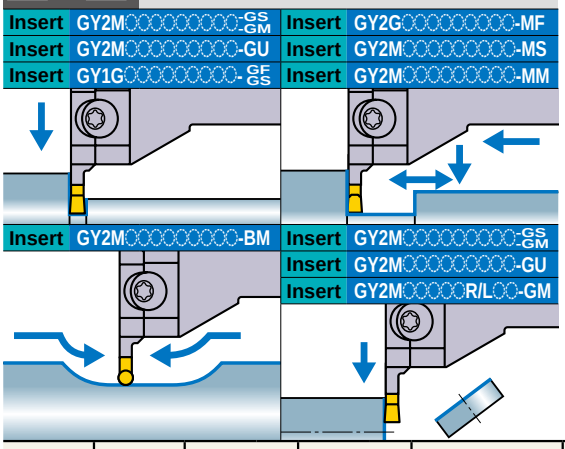
Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
K	.315", 8.00mm				●
	RE 0.8mm		●	●	
	RE 1.2mm			●	

● : Gauge insert shown dimensions

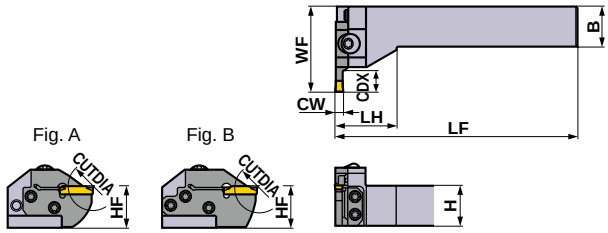
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

2-2 90° type holder (Metric)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
D	2.00 2.24	6	12	Modular	R	GYHR2020K90-M20L	●	GYM20LA-D06	●	A
					L	GYHL2020K90-M20R	●	GYM20RA-D06	●	A
				Modular	R	GYHR2525M90-M25L	●	GYM25LA-D06	●	A
					L	GYHL2525M90-M25R	●	GYM25RA-D06	●	A
		10	20	Modular	R	GYHR2020K90-M20L	●	GYM20LA-D10	●	A
					L	GYHL2020K90-M20R	●	GYM20RA-D10	●	A
		12	24	Modular	R	GYHR2525M90-M25L	●	GYM25LA-D12	●	A
					L	GYHL2525M90-M25R	●	GYM25RA-D12	●	A
		18 ✶4	36	Modular	R	GYHR2020K90-M20L	●	GYM20LB-D18	●	B
					L	GYHL2020K90-M20R	●	GYM20RB-D18	●	B
		20 ✶1	40 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-D20	●	B
					L	GYHL2525M90-M25R	●	GYM25RA-D20	●	B
E	2.39 2.50 2.74	6	12	Modular	R	GYHR2020K90-M20L	●	GYM20LA-E06	●	A
					L	GYHL2020K90-M20R	●	GYM20RA-E06	●	A
				Modular	R	GYHR2525M90-M25L	●	GYM25LA-E06	●	A
					L	GYHL2525M90-M25R	●	GYM25RA-E06	●	A
		10	20	Modular	R	GYHR2020K90-M20L	●	GYM20LA-E10	●	A
					L	GYHL2020K90-M20R	●	GYM20RA-E10	●	A
		12	24	Modular	R	GYHR2525M90-M25L	●	GYM25LA-E12	●	A
					L	GYHL2525M90-M25R	●	GYM25RA-E12	●	A
		18 ✶4	36	Modular	R	GYHR2020K90-M20L	●	GYM20LB-E18	●	B
					L	GYHL2020K90-M20R	●	GYM20RB-E18	●	B
		20 ✶1	40 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-E20	●	B
					L	GYHL2525M90-M25R	●	GYM25RA-E20	●	B

✶1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
✶4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

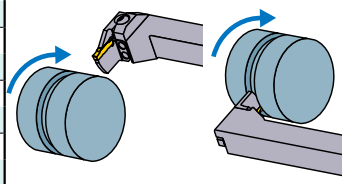
● : Inventory maintained.

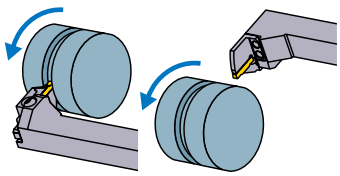
* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR2020K90-M20L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHL2020K90-M20R			
GYHR2525M90-M25L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) *3						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
20	20	125	35	20	39	**R**
20	20	125	35	20	39	
25	25	150	38	25	45	
25	25	150	38	25	45	
20	20	125	35	20	45	
20	20	125	35	20	45	
25	25	150	38	25	53	
25	25	150	38	25	53	
20	20	125	35	20	51	
20	20	125	35	20	51	
25	25	150	38	25	59	
25	25	150	38	25	59	
20	20	125	35	20	39	**L**
20	20	125	35	20	39	
25	25	150	38	25	45	
25	25	150	38	25	45	
20	20	125	35	20	45	
20	20	125	35	20	45	
25	25	150	38	25	53	
25	25	150	38	25	53	
20	20	125	35	20	51	
20	20	125	35	20	51	
25	25	150	38	25	59	
25	25	150	38	25	59	





Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○−Breaker
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
D	.079", 2.00mm	●	●	●	●	●
E	.094", 2.39mm	●	●	●		●
	.098", 2.50mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

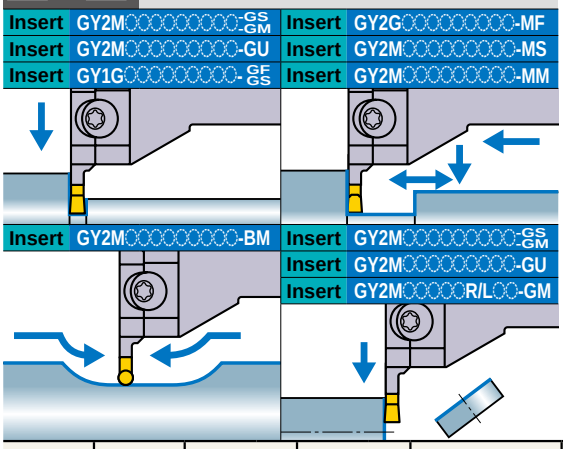
Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
D	.079", 2.00mm	●	●	●	●
	.088", 2.24mm	●			
E	.094", 2.39mm	●			
	.098", 2.50mm	●	●	●	●
	.108", 2.74mm	●			

● : Gauge insert shown dimensions

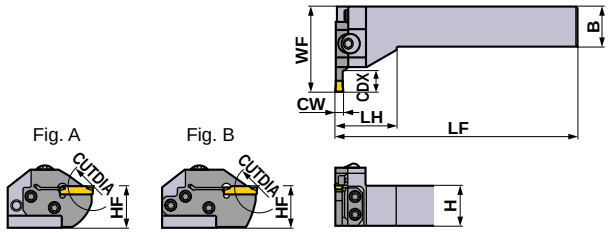
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

2-2 90° type holder (Metric)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	6	12	Modular	R	GYHR2020K90-M20L	●	GYM20LA-F06	●	A
					L	GYHL2020K90-M20R	●	GYM20RA-F06	●	A
				Modular	R	GYHR2525M90-M25L	●	GYM25LA-F06	●	A
					L	GYHL2525M90-M25R	●	GYM25RA-F06	●	A
		10	20	Modular	R	GYHR2020K90-M20L	●	GYM20LA-F10	●	A
					L	GYHL2020K90-M20R	●	GYM20RA-F10	●	A
		12	24	Modular	R	GYHR2525M90-M25L	●	GYM25LA-F12	●	A
					L	GYHL2525M90-M25R	●	GYM25RA-F12	●	A
		18 ✶4	36	Modular	R	GYHR2020K90-M20L	●	GYM20LB-F18	●	B
					L	GYHL2020K90-M20R	●	GYM20RB-F18	●	B
		20 ✶1	40 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-F20	●	B
					L	GYHL2525M90-M25R	●	GYM25RA-F20	●	B
G	4.00 4.24	8	16	Modular	R	GYHR2525M90-M25L	●	GYM25LA-G08	●	A
					L	GYHL2525M90-M25R	●	GYM25RA-G08	●	A
		12	24	Modular	R	GYHR2020K90-M20L	●	GYM20LA-G12	●	A
					L	GYHL2020K90-M20R	●	GYM20RA-G12	●	A
		14	28	Modular	R	GYHR2525M90-M25L	●	GYM25LA-G14	●	A
					L	GYHL2525M90-M25R	●	GYM25RA-G14	●	A
		25 ✶1	50 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-G25	●	B
					L	GYHL2525M90-M25R	●	GYM25RA-G25	●	B

✶1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
✶4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

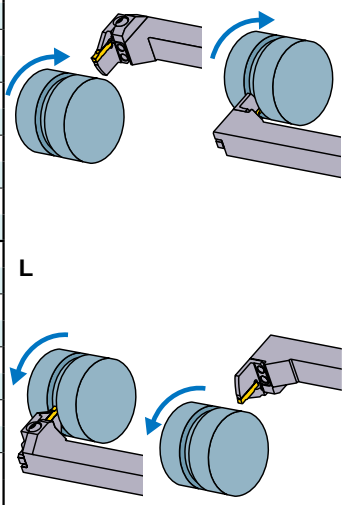
● : Inventory maintained.

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR2020K90-M20L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHL2020K90-M20R			
GYHR2525M90-M25L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) *3						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
20	20	125	35	20	39	**R**
20	20	125	35	20	39	
25	25	150	38	25	45	
25	25	150	38	25	45	
20	20	125	35	20	45	
20	20	125	35	20	45	
25	25	150	38	25	53	
25	25	150	38	25	53	
20	20	125	35	20	51	
20	20	125	35	20	51	
25	25	150	38	25	59	
25	25	150	38	25	59	
25	25	150	38	25	47	**L**
25	25	150	38	25	47	
20	20	125	35	20	45	
20	20	125	35	20	45	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker
G	GY○○0400/0424G○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
F	.118", 3.00mm	●	●	●	●	●
	.125", 3.18mm	●	●	●		●
G	.157", 4.00mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

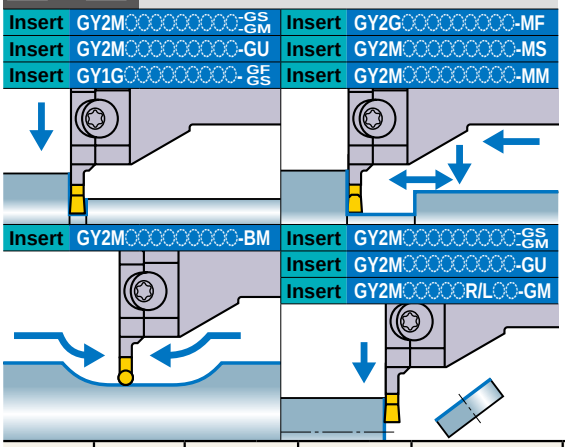
Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
F	.118", 3.00mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm			●	
	.125", 3.18mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	.128", 3.24mm	●			
G	.157", 4.00mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm	●		●	
	.167", 4.24mm	●			

● : Gauge insert shown dimensions

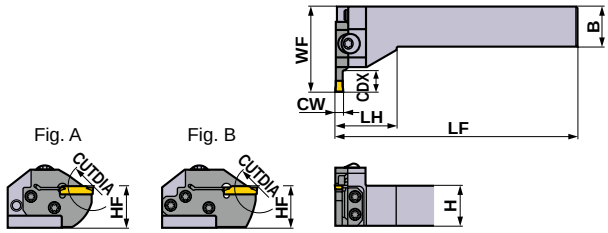
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING)

2-2 90° type holder (Metric)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	8	16	Modular	R	GYHR2525M90-M25L	●	GYM25LA-H08	●	A
					L	GYHL2525M90-M25R	●	GYM25RA-H08	●	A
		12	24	Modular	R	GYHR2020K90-M20L	●	GYM20LA-H12	●	A
					L	GYHL2020K90-M20R	●	GYM20RA-H12	●	A
		14	28	Modular	R	GYHR2525M90-M25L	●	GYM25LA-H14	●	A
					L	GYHL2525M90-M25R	●	GYM25RA-H14	●	A
		25 ✶1	50 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-H25	●	B
					L	GYHL2525M90-M25R	●	GYM25RA-H25	●	B
J	6.00 6.31 6.35	8	16	Modular	R	GYHR2525M90-M25L	●	GYM25LA-J08	●	A
					L	GYHL2525M90-M25R	●	GYM25RA-J08	●	A
		14	28	Modular	R	GYHR2525M90-M25L	●	GYM25LA-J14	●	A
					L	GYHL2525M90-M25R	●	GYM25RA-J14	●	A
		25 ✶1	50 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-J25	●	B
					L	GYHL2525M90-M25R	●	GYM25RA-J25	●	B

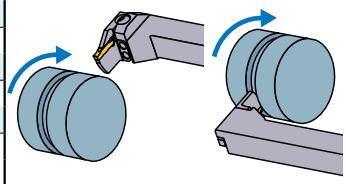
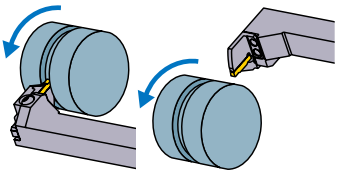
✶1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.

● : Inventory maintained.

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR2020K90-M20L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHL2020K90-M20R			
GYHR2525M90-M25L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) *3						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
25	25	150	38	25	47	**R**
25	25	150	38	25	47	
20	20	125	35	20	45	
20	20	125	35	20	45	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
						
25	25	150	38	25	47	**L**
25	25	150	38	25	47	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
						

Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○−Breaker
J	GY○○0600/0631/0635J○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
H	.187", 4.75mm	●	●	●		●
	.197", 5.00mm	●	●	●	●	●
J	.236", 6.00mm	●	●	●		
	.250", 6.35mm	●	●	●		

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
H	.187", 4.75mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	RE 0.8mm	●			
	.197", 5.00mm				●
	RE 0.2mm	●			
	RE 0.4mm	●	●	●	
	RE 0.8mm	●	●	●	
	.206", 5.24mm	●			
J	.236", 6.00mm				●
	RE 0.2mm	●			
	RE 0.4mm	●	●	●	
	RE 0.8mm	●	●	●	
	.248", 6.31mm	●			
	.250", 6.35mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	RE 0.8mm	●			

● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL RECESSING)

3-2 50° type holder (Metric) NEW

(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

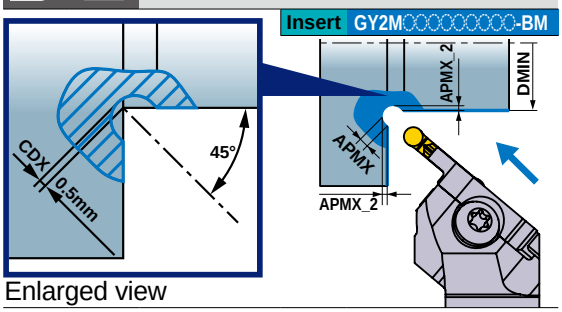
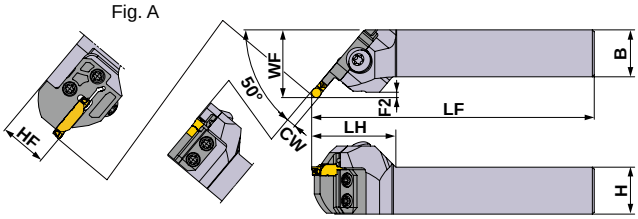


Fig. A



Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	DMIN (mm)	APMX (mm)	APMX_2 (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
D	2.00	0.5	30	1.5	0.646	Modular	R	GYHR2020K50-M20L	●	GYM20LC-D005	●	A
							L	GYHL2020K50-M20R	●	GYM20RC-D005	●	A
						Modular	R	GYHR2525M50-M25L	●	GYM25LC-D005	●	A
							L	GYHL2525M50-M25R	●	GYM25RC-D005	●	A
E	2.50			1.75	0.72	Modular	R	GYHR2020K50-M20L	●	GYM20LC-E005	●	A
							L	GYHL2020K50-M20R	●	GYM20RC-E005	●	A
						Modular	R	GYHR2525M50-M25L	●	GYM25LC-E005	●	A
							L	GYHL2525M50-M25R	●	GYM25RC-E005	●	A
F	3.00 3.18			2	0.793	Modular	R	GYHR2020K50-M20L	●	GYM20LC-F005	●	A
							L	GYHL2020K50-M20R	●	GYM20RC-F005	●	A
						Modular	R	GYHR2525M50-M25L	●	GYM25LC-F005	●	A
							L	GYHL2525M50-M25R	●	GYM25RC-F005	●	A
G	4.00		20	2.5	0.939	Modular	R	GYHR2020K50-M20L	●	GYM20LC-G005	●	A
							L	GYHL2020K50-M20R	●	GYM20RC-G005	●	A
						Modular	R	GYHR2525M50-M25L	●	GYM25LC-G005	●	A
							L	GYHL2525M50-M25R	●	GYM25RC-G005	●	A
H	4.75 5.00			2.88	1.049	Modular	R	GYHR2020K50-M20L	●	GYM20LC-H005	●	A
							L	GYHL2020K50-M20R	●	GYM20RC-H005	●	A
						Modular	R	GYHR2525M50-M25L	●	GYM25LC-H005	●	A
							L	GYHL2525M50-M25R	●	GYM25RC-H005	●	A
J	6.00 6.35			3.5	1.232	Modular	R	GYHR2525M50-M25L	●	GYM25LC-J005	●	A
							L	GYHL2525M50-M25R	●	GYM25RC-J005	●	A

✶1 Blades for external and face grooving cannot be used since it interferes with work materials.
✶2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **WF** and **F2** values may vary.

● : Inventory maintained.

* Wrench : ① : Clamp Screw, ② : Blade Screw

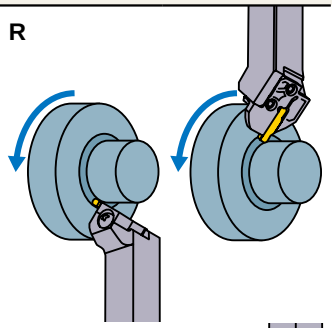
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR/L2020K50-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M50-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

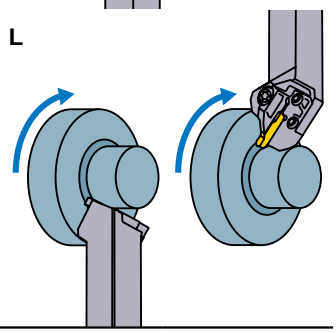
Dimensions (mm) *2						
H	**B**	**LF**	**LH**	**HF**	**WF**	**F2**
20	20	125	40	20	32	1.6
20	20	125	40	20	32	1.6
25	25	150	45	25	35	1.6
25	25	150	45	25	35	1.6
20	20	125	40	20	32	1.8
20	20	125	40	20	32	1.8
25	25	150	45	25	35	1.8
25	25	150	45	25	35	1.8
20	20	125	40	20	32	2.0
20	20	125	40	20	32	2.0
25	25	150	45	25	35	2.0
25	25	150	45	25	35	2.0
20	20	125	40	20	32	2.4
20	20	125	40	20	32	2.4
25	25	150	45	25	35	2.4
25	25	150	45	25	35	2.4
20	20	125	40	20	33	2.8
20	20	125	40	20	33	2.8
25	25	150	45	25	36	2.8
25	25	150	45	25	36	2.8
25	25	150	44	25	36	3.4
25	25	150	44	25	36	3.4

Cutting Mode

R



L



Select an Insert

Insert Number
GY2M○○○○○○○○○N-BM

For Multifunctional Grooving ➤ F015

Seat Size	Breaker / CW	BM Ball nose
D	.079", 2.00mm	●
E	.098", 2.50mm	●
F	.118", 3.00mm	●
	.125", 3.18mm	●
G	.157", 4.00mm	●
H	.187", 4.75mm	●
	.197", 5.00mm	●
J	.236", 6.00mm	●
	.250", 6.35mm	●

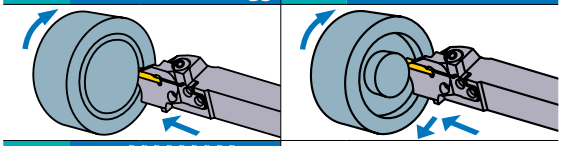
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F210
INSTRUCTION MANUAL ➤ F210

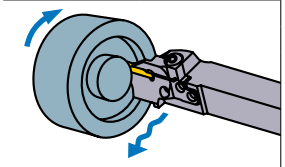
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/GM | Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU | Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS | Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

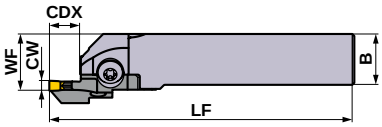


Fig. A

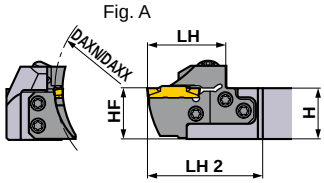
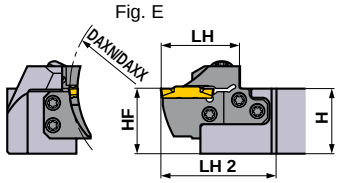


Fig. E



Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
D	.079 .088	1.575	1.969	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-D12-040	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-D12-040	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-D12-040	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-D12-040	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-D12-040	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-D12-040	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-D12-040	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-D12-040	●	E
		1.969	2.362	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-D12-050	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-D12-050	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-D12-050	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-D12-050	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-D12-050	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-D12-050	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-D12-050	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-D12-050	●	E
		2.362	2.953	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-D12-060	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-D12-060	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-D12-060	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-D12-060	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-D12-060	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-D12-060	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-D12-060	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-D12-060	●	E
		2.953	3.937	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-D12-075	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-D12-075	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-D12-075	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-D12-075	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-D12-075	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-D12-075	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-D12-075	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-D12-075	●	E

*1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : Inventory maintained.

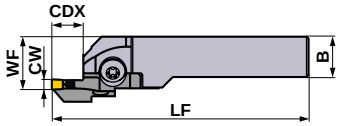
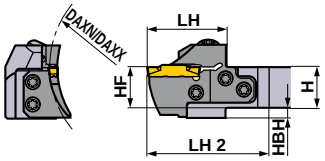


Fig. C



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

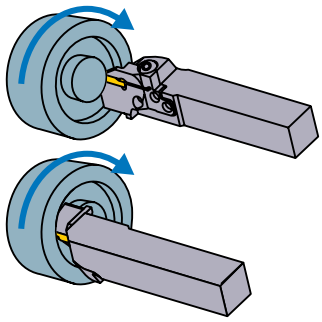
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

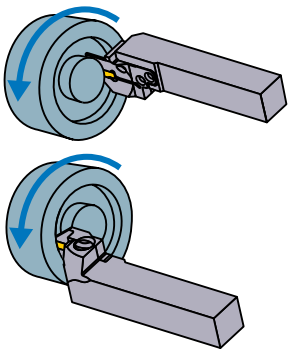
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
D	.079", 2.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
D	.079", 2.00mm	●	●	●	●
	.088", 2.24mm	●			

● : Gauge insert shown dimensions

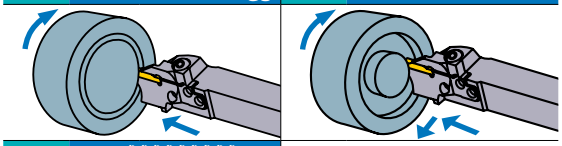
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

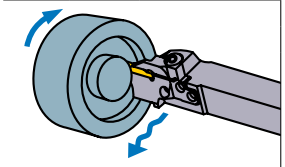
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM | Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU | Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS | Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

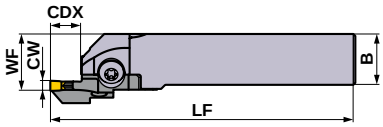


Fig. A

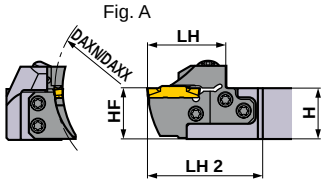
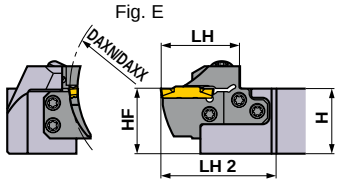


Fig. E



Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
D	.079 .088	3.937	5.906	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-D12-100	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-D12-100	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-D12-100	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-D12-100	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-D12-100	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-D12-100	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-D12-100	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-D12-100	●	E
		5.315	7.874	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-D12-135	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-D12-135	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-D12-135	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-D12-135	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-D12-135	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-D12-135	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-D12-135	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-D12-135	●	E
		7.087	9.843	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-D12-180	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-D12-180	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-D12-180	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-D12-180	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-D12-180	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-D12-180	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-D12-180	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-D12-180	●	E

*1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : Inventory maintained.

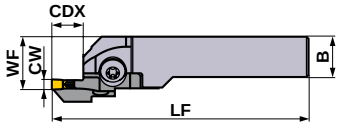
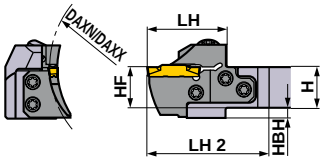


Fig. C



Right hand tool holder shown.

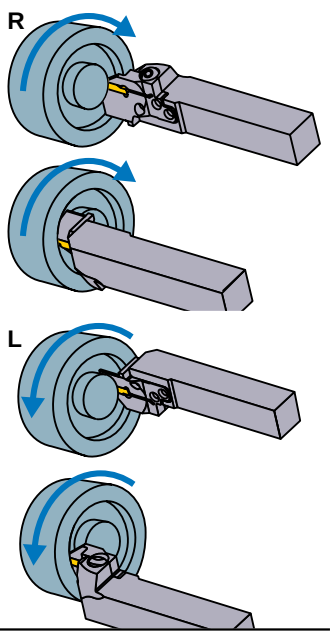
* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

Dimensions (inch) *1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—

Cutting Mode



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
D	.079", 2.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
D	.079", 2.00mm	●	●	●	●
	.088", 2.24mm	●			

● : Gauge insert shown dimensions

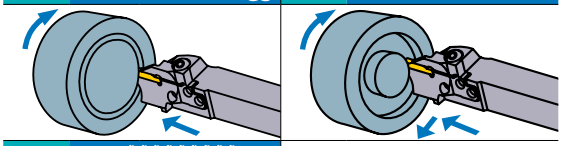
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

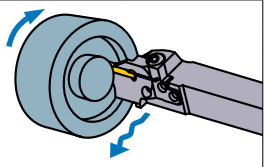
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

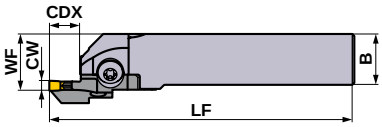


Fig. A

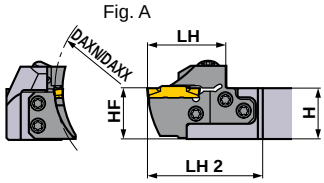
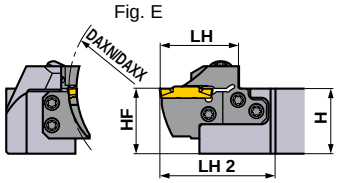


Fig. E



Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
E	.094 .098 .108	1.575	1.969	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-E12-040	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-E12-040	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-E12-040	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-E12-040	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-E12-040	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-E12-040	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-E12-040	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-E12-040	●	E
		1.969	2.362	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-E12-050	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-E12-050	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-E12-050	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-E12-050	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-E12-050	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-E12-050	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-E12-050	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-E12-050	●	E
		2.362	2.953	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-E12-060	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-E12-060	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-E12-060	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-E12-060	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-E12-060	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-E12-060	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-E12-060	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-E12-060	●	E
		2.953	3.937	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-E12-075	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-E12-075	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-E12-075	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-E12-075	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-E12-075	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-E12-075	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-E12-075	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-E12-075	●	E

*1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : Inventory maintained.

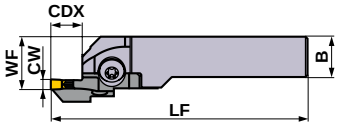
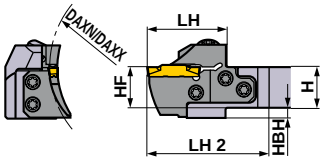


Fig. C



Right hand tool holder shown.

* Wrench : ① : Clamp Screw, ② : Blade Screw

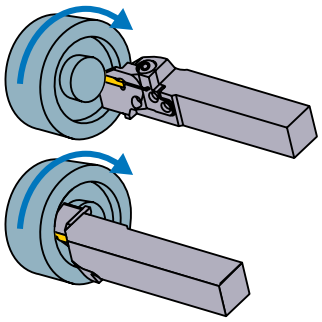
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

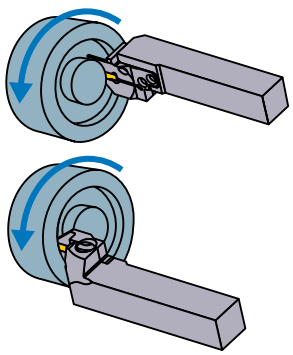
Dimensions (inch) *1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
E	.094", 2.39mm	●	●	●	●
	.098", 2.50mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
E	.094", 2.39mm	●			
	.098", 2.50mm	●	●	●	●
	.108", 2.74mm	●			

● : Gauge insert shown dimensions

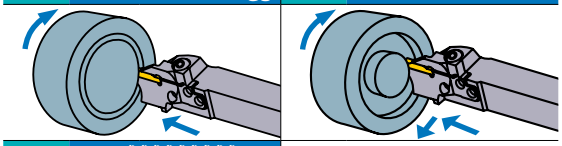
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

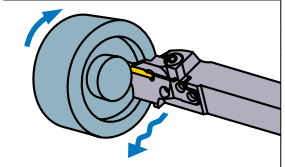
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM | Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU | Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS | Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

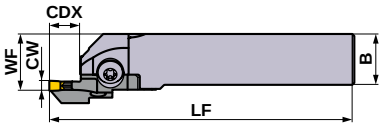


Fig. A

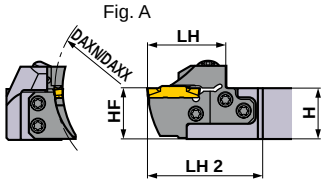
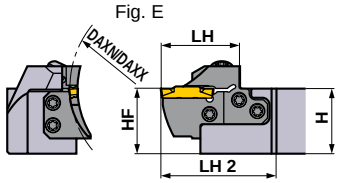


Fig. E



Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
E	.094 .098 .108	3.937	5.906	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-E12-100	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-E12-100	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-E12-100	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-E12-100	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-E12-100	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-E12-100	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-E12-100	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-E12-100	●	E
		5.315	7.874	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-E12-135	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-E12-135	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-E12-135	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-E12-135	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-E12-135	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-E12-135	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-E12-135	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-E12-135	●	E
		7.087	9.843	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-E12-180	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-E12-180	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-E12-180	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-E12-180	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-E12-180	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-E12-180	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-E12-180	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-E12-180	●	E

*1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : Inventory maintained.

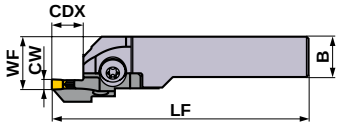
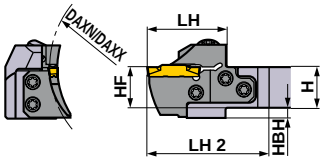


Fig. C



Right hand tool holder shown.

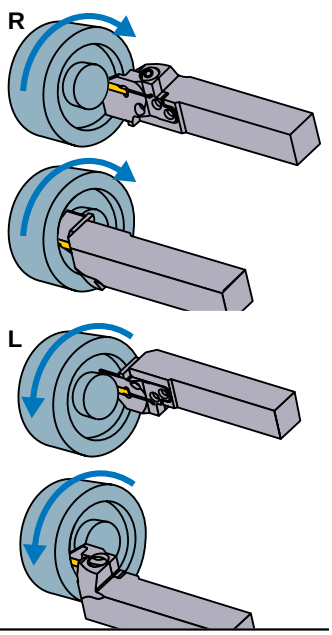
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—

Cutting Mode



Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
E	.094", 2.39mm	●	●	●	●
	.098", 2.50mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
E	.094", 2.39mm	●			
	.098", 2.50mm	●	●	●	●
	.108", 2.74mm	●			

● : Gauge insert shown dimensions

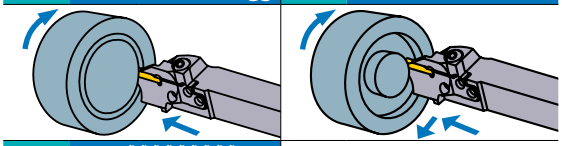
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

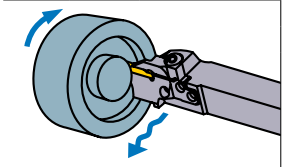
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM | Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU | Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS | Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

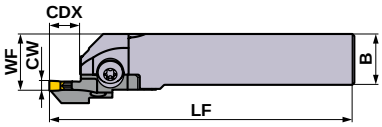


Fig. A

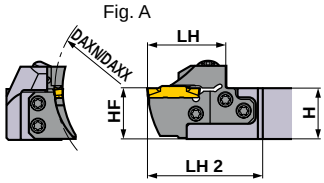
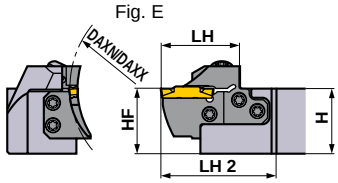


Fig. E



Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
F	.118 .125 .128	1.378	1.575	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F12-035	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-F12-035	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F12-035	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-F12-035	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F12-035	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-F12-035	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F12-035	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-F12-035	●	E
		1.575	1.969	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F12-040	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-F12-040	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F12-040	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-F12-040	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F12-040	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-F12-040	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F12-040	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-F12-040	●	E
		1.969	2.362	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F12-050	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-F12-050	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F12-050	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-F12-050	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F12-050	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-F12-050	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F12-050	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-F12-050	●	E

*1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : Inventory maintained.

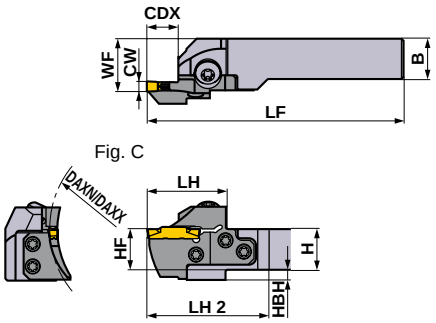


Fig. C

Right hand tool holder shown.

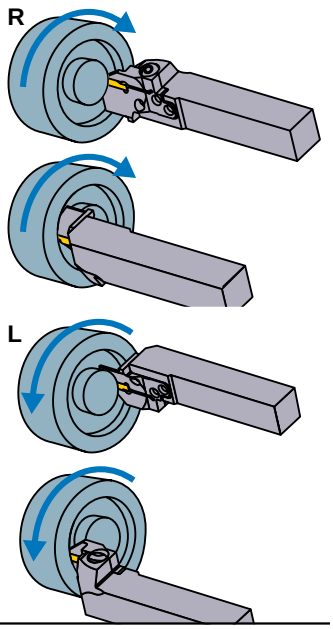
* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

Dimensions (inch) *1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—

Cutting Mode



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
F	.118", 3.00mm	●	●	●	●
	.125", 3.18mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
F	.118", 3.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24mm	●			

● : Gauge insert shown dimensions

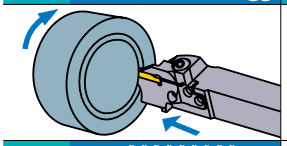
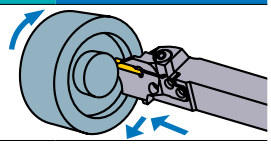
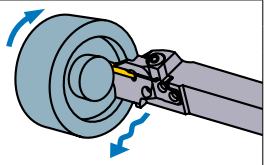
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

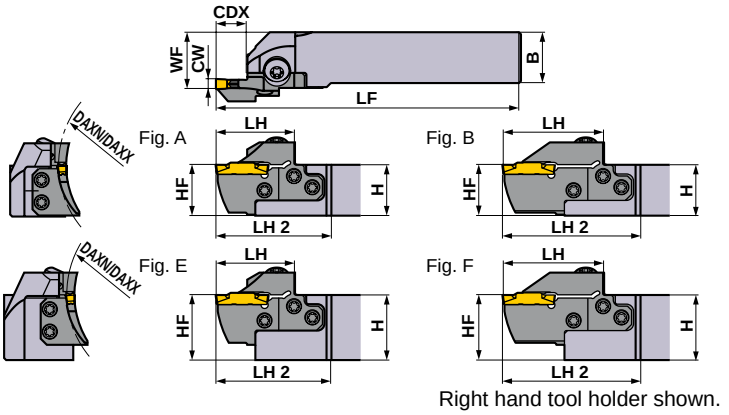
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM


(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

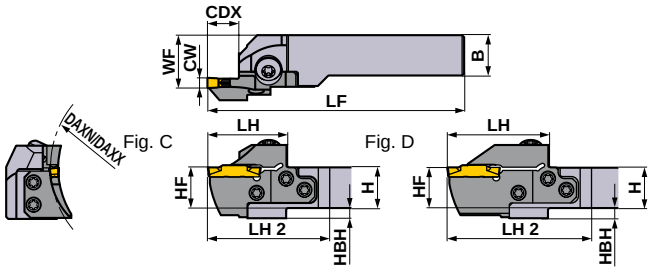


Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	.118 .125 .128	2.362	2.953	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F12-060	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-F12-060	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F12-060	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-F12-060	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F12-060	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-F12-060	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F12-060	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-F12-060	●	E
				.787★2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F20-060	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-F20-060	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F20-060	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-F20-060	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F20-060	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-F20-060	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F20-060	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-F20-060	●	F
		2.953	3.937	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F12-075	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-F12-075	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F12-075	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-F12-075	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F12-075	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-F12-075	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F12-075	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-F12-075	●	E
				.787★2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F20-075	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-F20-075	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F20-075	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-F20-075	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F20-075	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-F20-075	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F20-075	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-F20-075	●	F

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

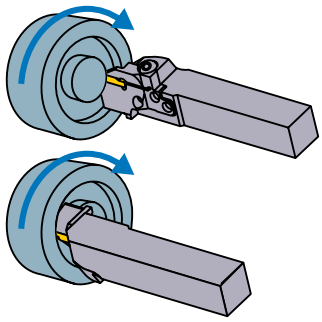
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

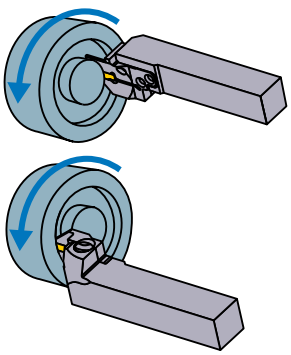
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.236	1.772	.477	.750	1.000	.250
.750	.750	5.236	1.772	.477	.750	1.000	.250
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.236	1.772	.477	.750	1.000	.250
.750	.750	5.236	1.772	.477	.750	1.000	.250
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
F	.118", 3.00mm	●	●	●	●
	.125", 3.18mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
F	.118", 3.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24mm	●			

● : Gauge insert shown dimensions

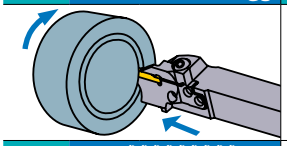
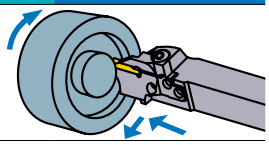
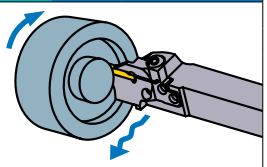
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

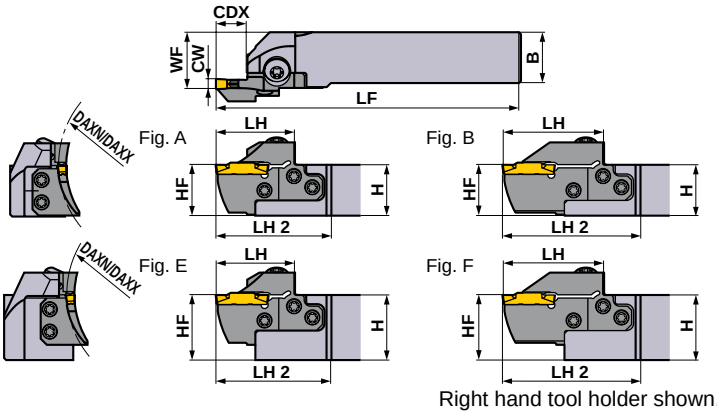
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM

(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

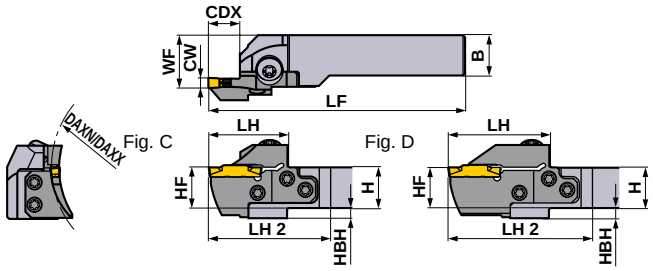


Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
F	.118 .125 .128	3.937	5.906	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F12-100	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-F12-100	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F12-100	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-F12-100	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F12-100	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-F12-100	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F12-100	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-F12-100	●	E
				.787★2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F20-100	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-F20-100	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F20-100	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-F20-100	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F20-100	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-F20-100	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F20-100	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-F20-100	●	F
		5.315	7.874	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F12-135	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-F12-135	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F12-135	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-F12-135	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F12-135	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-F12-135	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F12-135	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-F12-135	●	E
				.787★2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F20-135	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-F20-135	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F20-135	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-F20-135	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F20-135	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-F20-135	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F20-135	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-F20-135	●	F

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

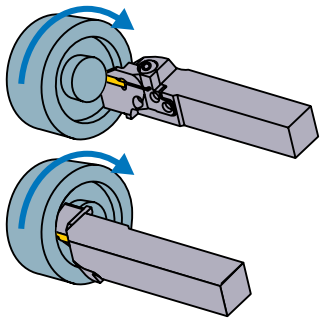
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

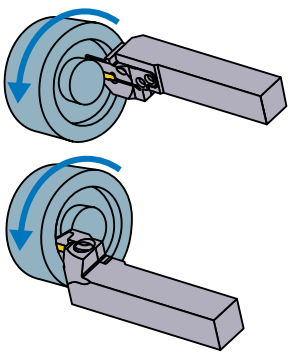
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.236	1.772	.477	.750	1.000	.250
.750	.750	5.236	1.772	.477	.750	1.000	.250
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.236	1.772	.477	.750	1.000	.250
.750	.750	5.236	1.772	.477	.750	1.000	.250
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
F	.118", 3.00mm	●	●	●	●
	.125", 3.18mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
F	.118", 3.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24mm	●			

● : Gauge insert shown dimensions

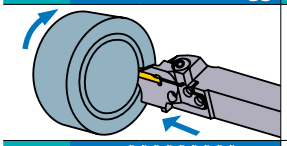
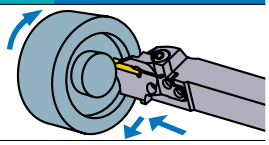
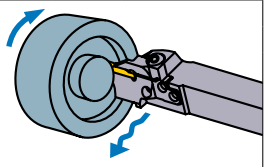
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

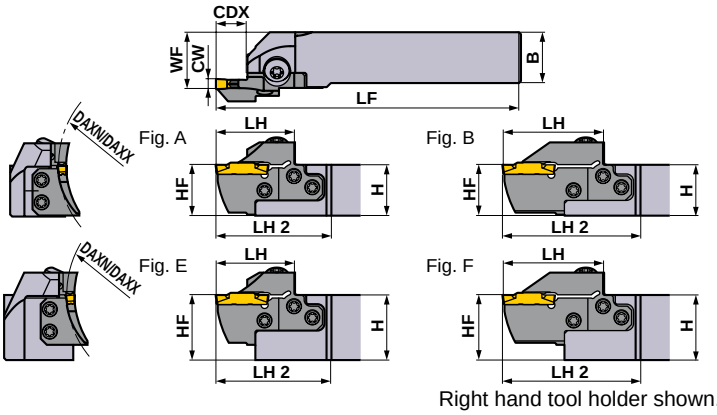
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM

(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

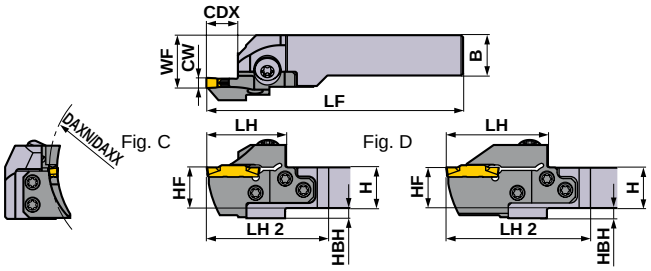


Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
F	.118 .125 .128	7.087	9.843	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F12-180	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-F12-180	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F12-180	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-F12-180	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F12-180	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-F12-180	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F12-180	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-F12-180	●	E
				.787★2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F20-180	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-F20-180	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F20-180	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-F20-180	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F20-180	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-F20-180	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F20-180	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-F20-180	●	F
		8.858	39.331	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F12-225	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-F12-225	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F12-225	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-F12-225	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F12-225	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-F12-225	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F12-225	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-F12-225	●	E
				.787★2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F20-225	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-F20-225	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F20-225	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-F20-225	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F20-225	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-F20-225	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F20-225	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-F20-225	●	F

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

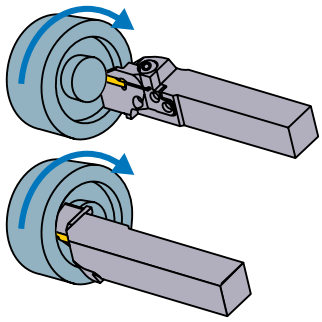
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

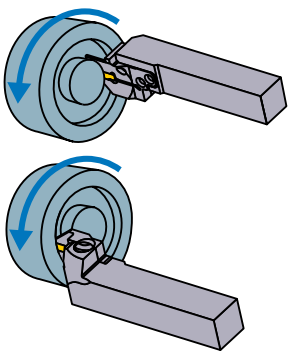
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.236	1.772	.477	.750	1.000	.250
.750	.750	5.236	1.772	.477	.750	1.000	.250
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.236	1.772	.477	.750	1.000	.250
.750	.750	5.236	1.772	.477	.750	1.000	.250
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
F	.118", 3.00mm	●	●	●	●
	.125", 3.18mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
F	.118", 3.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24mm	●			

● : Gauge insert shown dimensions

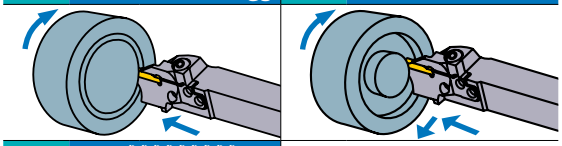
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

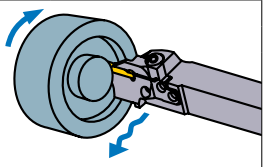
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

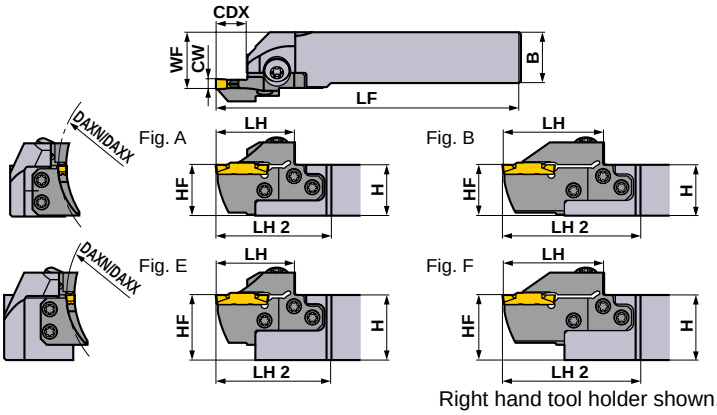
Insert GY2M○○○○○○○○○-GS/-GM | Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU | Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS | Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

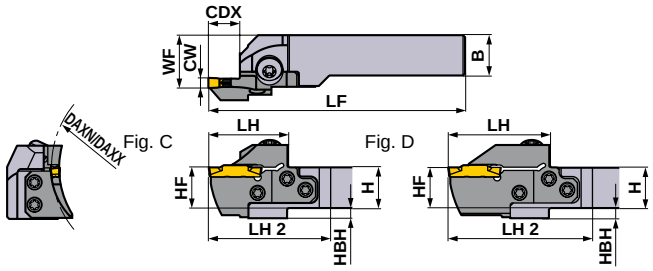


Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
G	.157 .167	1.575	1.969	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G14-040	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-G14-040	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G14-040	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-G14-040	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G14-040	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-G14-040	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G14-040	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-G14-040	●	E
		1.969	2.362	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G14-050	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-G14-050	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G14-050	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-G14-050	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G14-050	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-G14-050	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G14-050	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-G14-050	●	E
		2.362	3.346	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G14-060	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-G14-060	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G14-060	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-G14-060	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G14-060	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-G14-060	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G14-060	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-G14-060	●	E
				.984★2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G25-060	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-G25-060	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G25-060	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-G25-060	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G25-060	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-G25-060	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G25-060	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-G25-060	●	F

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained.



Right hand tool holder shown.

* Wrench : ① : Clamp Screw, ② : Blade Screw

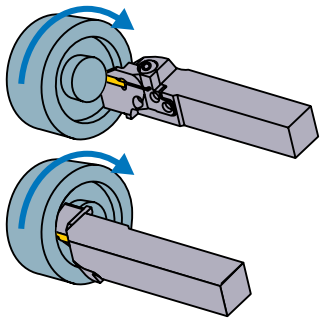
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

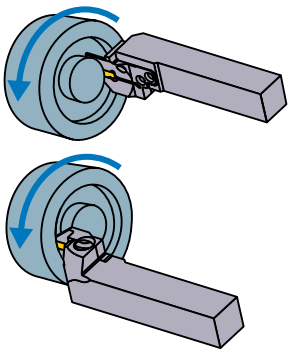
Dimensions (inch) *1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
G	.157", 4.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	Ball nose
G	.157", 4.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24mm	●			

● : Gauge insert shown dimensions

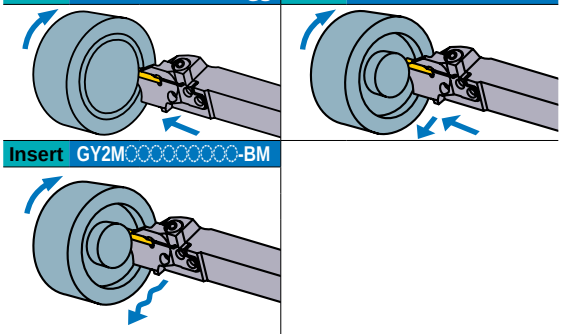
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

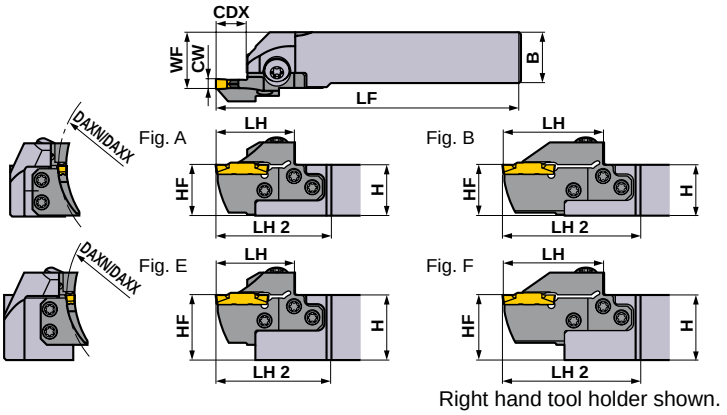
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert	GY2M○○○○○○○○○-GS -GM	Insert	GY2G○○○○○○○○○-MF
Insert	GY2M○○○○○○○○○-GU	Insert	GY2M○○○○○○○○○-MS
Insert	GY1G○○○○○○○○○- GF GS	Insert	GY2M○○○○○○○○○-MM
Insert	GY2M○○○○○○○○○-BM		



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

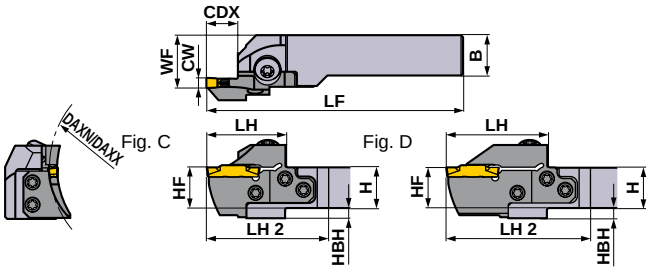


Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
G	.157 .167	3.346	4.921	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G14-085	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-G14-085	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G14-085	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-G14-085	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G14-085	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-G14-085	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G14-085	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-G14-085	●	E
				.984★2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G25-085	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-G25-085	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G25-085	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-G25-085	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G25-085	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-G25-085	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G25-085	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-G25-085	●	F
		4.921	7.874	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G14-125	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-G14-125	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G14-125	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-G14-125	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G14-125	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-G14-125	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G14-125	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-G14-125	●	E
				.984★2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G25-125	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-G25-125	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G25-125	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-G25-125	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G25-125	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-G25-125	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G25-125	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-G25-125	●	F

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained.



Right hand tool holder shown.

* Wrench : ① : Clamp Screw, ② : Blade Screw

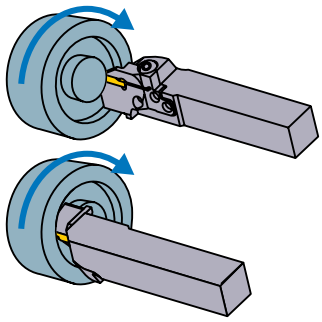
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

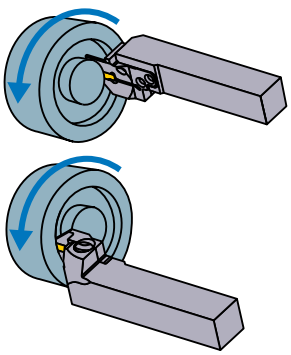
Dimensions (inch) *1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size \ Breaker CW	GU	GS	GM	GFGS
G .157", 4.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker CW	MF	MS	MM	BM
					Ball nose
G	.157", 4.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24mm	●			

● : Gauge insert shown dimensions

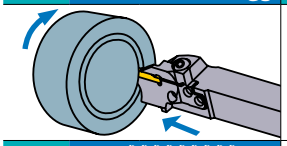
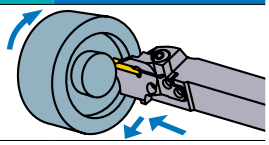
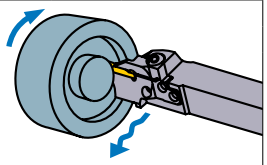
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

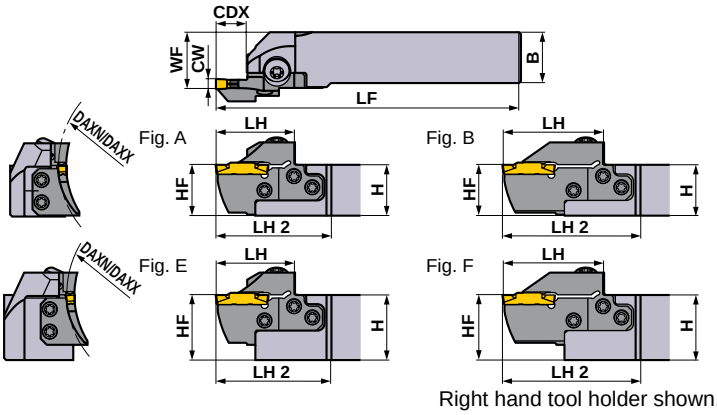
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM


(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

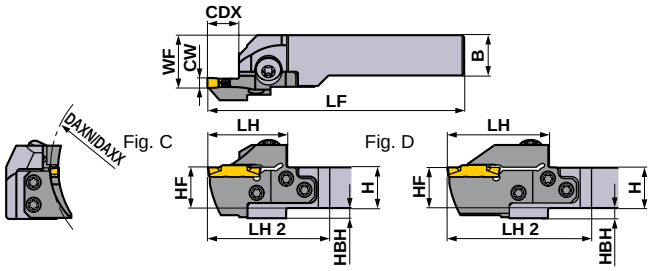


Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
G	.157 .167	7.087	11.024	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G14-180	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-G14-180	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G14-180	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-G14-180	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G14-180	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-G14-180	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G14-180	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-G14-180	●	E
				.984✱2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G25-180	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-G25-180	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G25-180	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-G25-180	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G25-180	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-G25-180	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G25-180	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-G25-180	●	F
		9.843	39.331	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G14-250	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-G14-250	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G14-250	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-G14-250	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G14-250	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-G14-250	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G14-250	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-G14-250	●	E
				.984✱2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G25-250	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-G25-250	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G25-250	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-G25-250	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G25-250	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-G25-250	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G25-250	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-G25-250	●	F

✱1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
✱2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

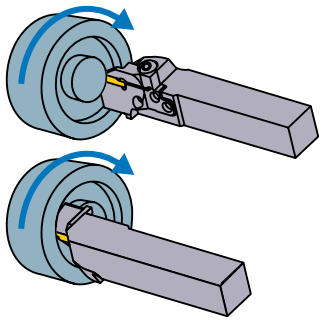
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

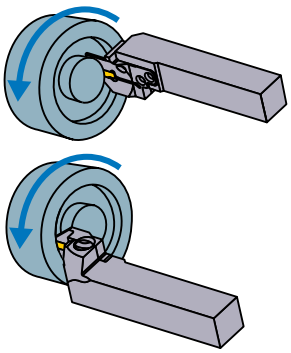
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size \ Breaker CW	GU	GS	GM	GFGS
G .157", 4.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker CW	MF	MS	MM	BM
					Ball nose
G	.157", 4.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24mm	●			

● : Gauge insert shown dimensions

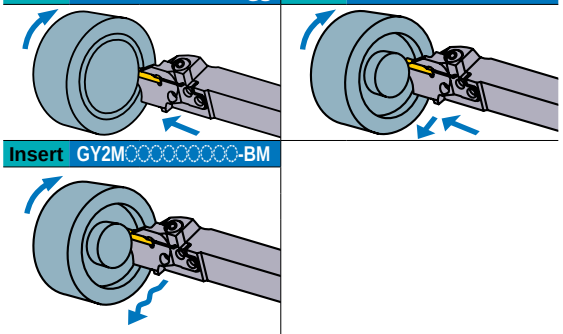
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

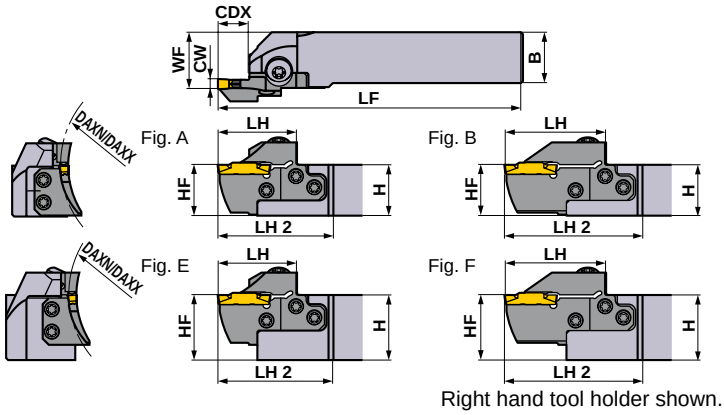
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert	GY2M○○○○○○○○○-GS -GM	Insert	GY2G○○○○○○○○○-MF
Insert	GY2M○○○○○○○○○-GU	Insert	GY2M○○○○○○○○○-MS
Insert	GY1G○○○○○○○○○- GF GS	Insert	GY2M○○○○○○○○○-MM
Insert	GY2M○○○○○○○○○-BM		



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

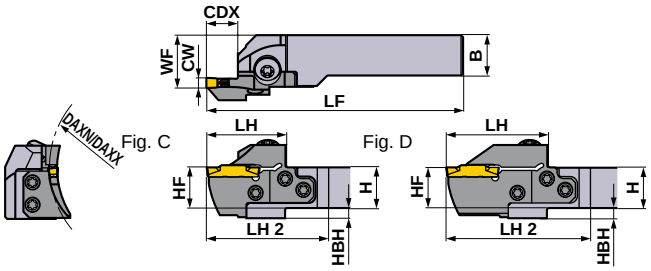


Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	.187 .197 .206	1.969	2.362	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H14-050	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-H14-050	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H14-050	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-H14-050	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H14-050	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-H14-050	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H14-050	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-H14-050	●	E
		2.362	3.346	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H14-060	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-H14-060	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H14-060	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-H14-060	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H14-060	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-H14-060	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H14-060	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-H14-060	●	E
				.984*2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H25-060	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-H25-060	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H25-060	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-H25-060	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H25-060	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-H25-060	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H25-060	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-H25-060	●	F

*1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
*2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained.



Right hand tool holder shown.

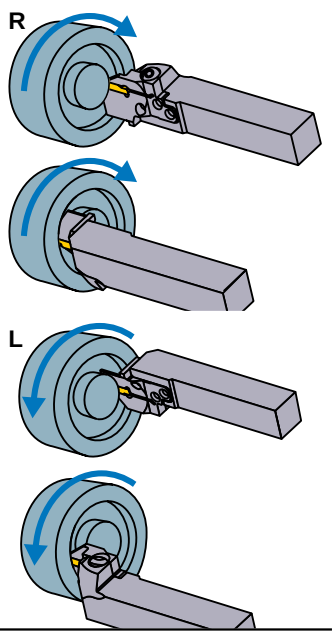
* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

Dimensions (inch) *1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
H	.187", 4.75mm	●	●	●	●
	.197", 5.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
H	.187", 4.75mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24mm	●			

● : Gauge insert shown dimensions

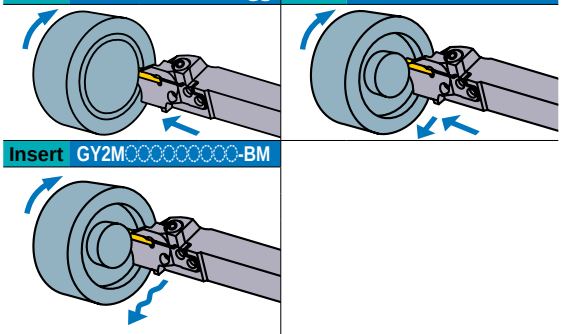
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

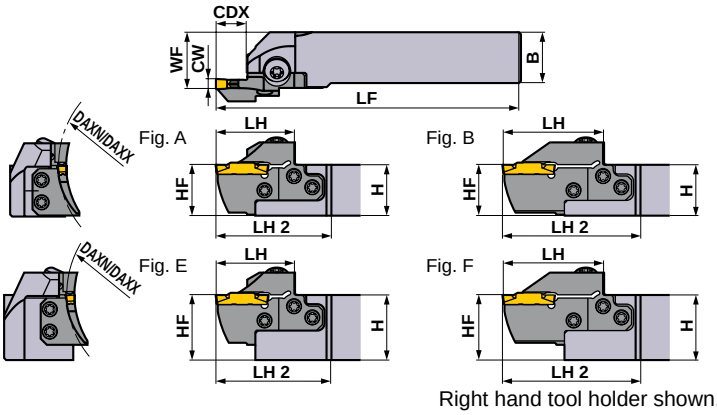
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert	GY2M○○○○○○○○○-GS -GM	Insert	GY2G○○○○○○○○○-MF
Insert	GY2M○○○○○○○○○-GU	Insert	GY2M○○○○○○○○○-MS
Insert	GY1G○○○○○○○○○- GF GS	Insert	GY2M○○○○○○○○○-MM
Insert	GY2M○○○○○○○○○-BM		



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

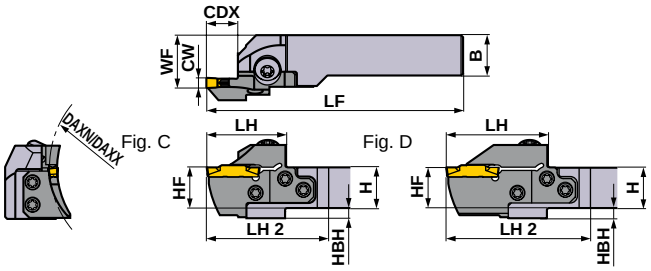


Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	.187 .197 .206	3.346	4.921	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H14-085	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-H14-085	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H14-085	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-H14-085	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H14-085	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-H14-085	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H14-085	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-H14-085	●	E
				.984★2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H25-085	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-H25-085	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H25-085	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-H25-085	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H25-085	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-H25-085	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H25-085	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-H25-085	●	F
		4.921	7.874	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H14-125	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-H14-125	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H14-125	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-H14-125	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H14-125	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-H14-125	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H14-125	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-H14-125	●	E
				.984★2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H25-125	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-H25-125	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H25-125	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-H25-125	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H25-125	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-H25-125	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H25-125	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-H25-125	●	F

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

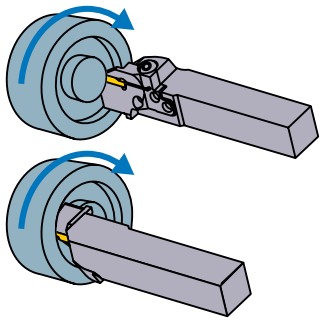
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

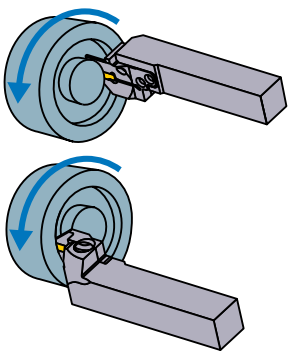
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
H	.187", 4.75mm	●	●	●	●
	.197", 5.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
H	.187", 4.75mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24mm	●			

● : Gauge insert shown dimensions

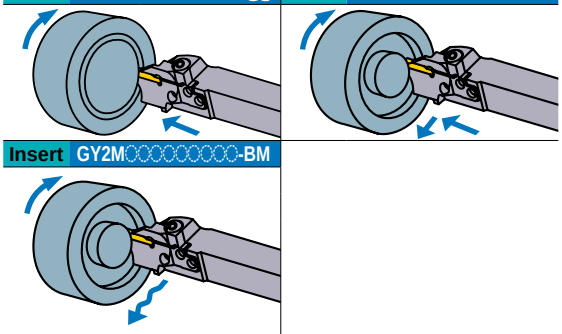
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

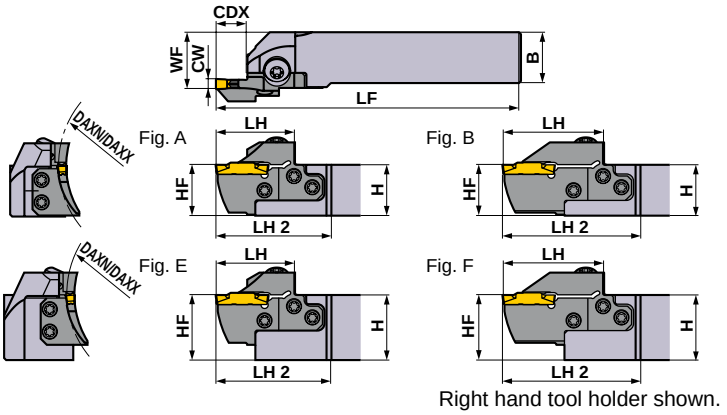
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert	GY2M○○○○○○○○○-GS -GM	Insert	GY2G○○○○○○○○○-MF
Insert	GY2M○○○○○○○○○-GU	Insert	GY2M○○○○○○○○○-MS
Insert	GY1G○○○○○○○○○- GF GS	Insert	GY2M○○○○○○○○○-MM
Insert	GY2M○○○○○○○○○-BM		



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

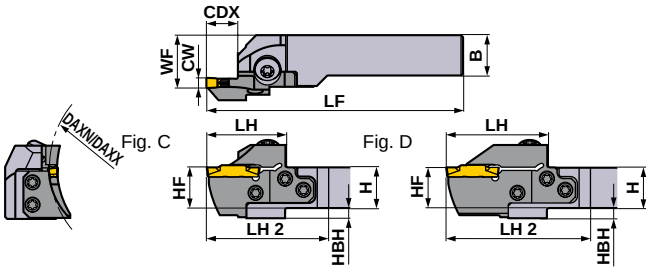


Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	.187 .197 .206	7.087	11.024	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H14-180	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-H14-180	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H14-180	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-H14-180	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H14-180	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-H14-180	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H14-180	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-H14-180	●	E
				.984★2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H25-180	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-H25-180	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H25-180	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-H25-180	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H25-180	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-H25-180	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H25-180	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-H25-180	●	F
		9.843	39.331	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H14-250	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-H14-250	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H14-250	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-H14-250	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H14-250	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-H14-250	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H14-250	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-H14-250	●	E
				.984★2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H25-250	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-H25-250	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H25-250	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-H25-250	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H25-250	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-H25-250	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H25-250	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-H25-250	●	F

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

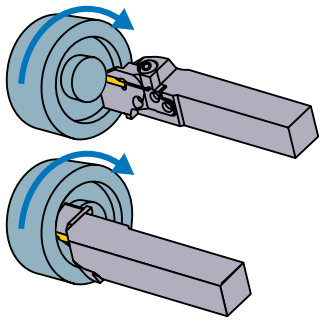
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

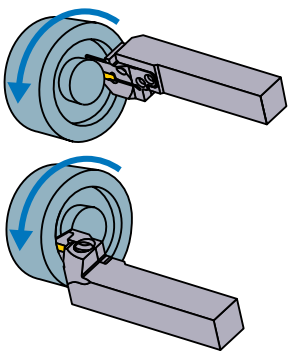
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
H	.187", 4.75mm	●	●	●	●
	.197", 5.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
H	.187", 4.75mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24mm	●			

● : Gauge insert shown dimensions

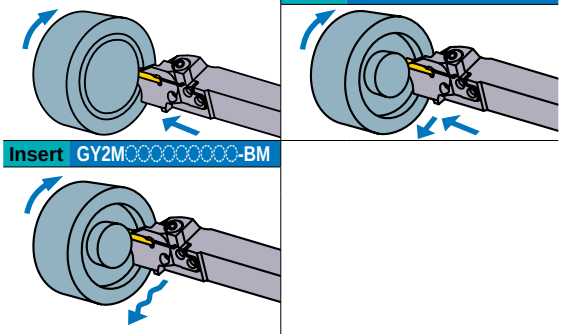
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

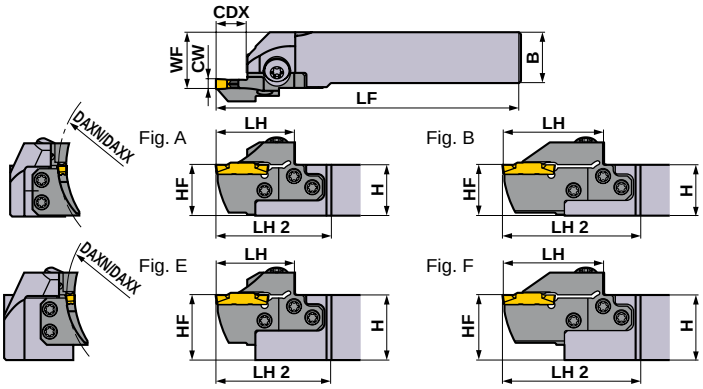
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M○○○○○○○○○-GU
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

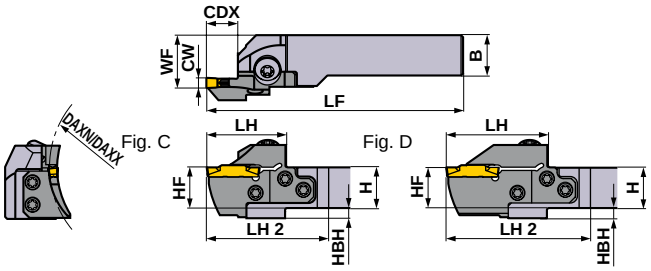


Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
J	.236 .248 .250	1.969	2.756	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-J14-050	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-J14-050	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-J14-050	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-J14-050	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-J14-050	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-J14-050	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-J14-050	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-J14-050	●	E
		2.756	4.331	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-J14-070	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-J14-070	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-J14-070	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-J14-070	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-J14-070	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-J14-070	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-J14-070	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-J14-070	●	E
				.984*2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-J25-070	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-J25-070	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-J25-070	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-J25-070	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-J25-070	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-J25-070	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-J25-070	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-J25-070	●	F
		4.331	7.874	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-J14-110	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-J14-110	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-J14-110	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-J14-110	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-J14-110	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-J14-110	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-J14-110	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-J14-110	●	E
				.984*2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-J25-110	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-J25-110	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-J25-110	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-J25-110	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-J25-110	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-J25-110	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-J25-110	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-J25-110	●	F

*1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
*2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained.



Right hand tool holder shown.

* Wrench : ① : Clamp Screw, ② : Blade Screw

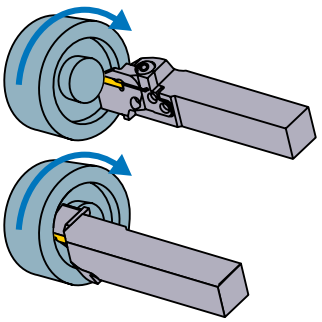
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

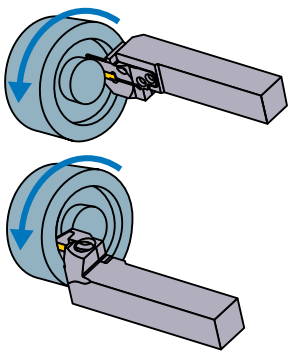
Dimensions (inch) *1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➤ F013

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
J	.236", 6.00mm	●	●	●	
	.250", 6.35mm	●	●	●	

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
J	.236", 6.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.248", 6.31mm	●			
	.250", 6.35mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			

● : Gauge insert shown dimensions

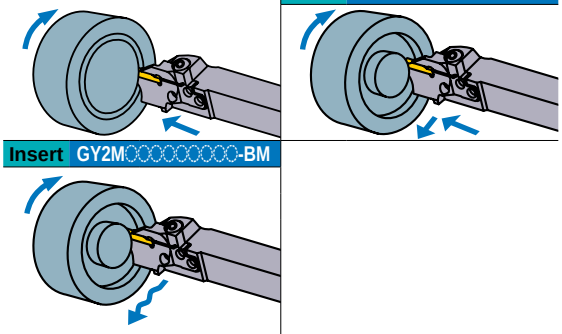
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

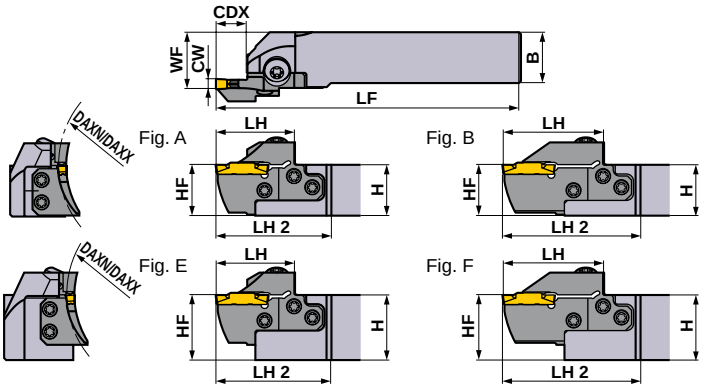
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M○○○○○○○○○-GU
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

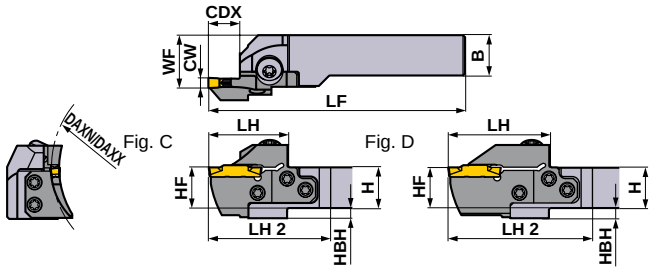


Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
J	.236 .248 .250	6.693	11.024	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-J14-170	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-J14-170	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-J14-170	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-J14-170	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-J14-170	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-J14-170	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-J14-170	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-J14-170	●	E
				.984★2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-J25-170	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-J25-170	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-J25-170	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-J25-170	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-J25-170	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-J25-170	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-J25-170	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-J25-170	●	F
		9.843	39.331	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-J14-250	●	C
						L	GYHLUS12C00-M25L	●	GYM25LD-J14-250	●	C
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-J14-250	●	A
						L	GYHLUS16D00-M25L	●	GYM25LD-J14-250	●	A
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-J14-250	●	E
						L	GYHLUS20D00-M25L	●	GYM25LD-J14-250	●	E
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-J14-250	●	E
						L	GYHLUS24E00-M25L	●	GYM25LD-J14-250	●	E
				.984★2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-J25-250	●	D
						L	GYHLUS12C00-M25L	●	GYM25LD-J25-250	●	D
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-J25-250	●	B
						L	GYHLUS16D00-M25L	●	GYM25LD-J25-250	●	B
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-J25-250	●	F
						L	GYHLUS20D00-M25L	●	GYM25LD-J25-250	●	F
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-J25-250	●	F
						L	GYHLUS24E00-M25L	●	GYM25LD-J25-250	●	F

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

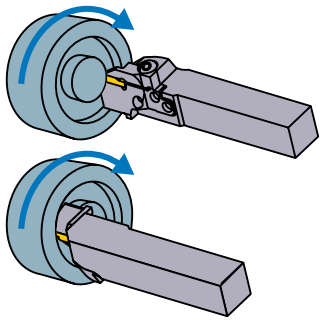
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

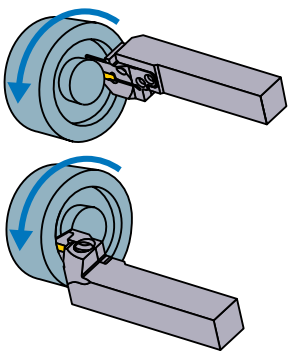
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➤ F013

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
J	.236", 6.00mm	●	●	●	
	.250", 6.35mm	●	●	●	

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
J	.236", 6.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.248", 6.31mm	●			
	.250", 6.35mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			

● : Gauge insert shown dimensions

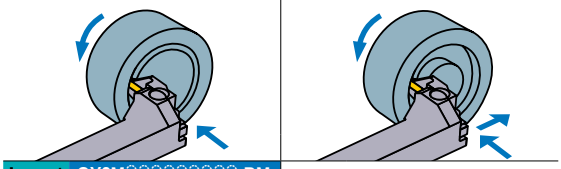
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

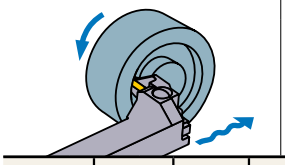
GY SERIES (FACE GROOVING)

5-1 90° type holder (inch)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

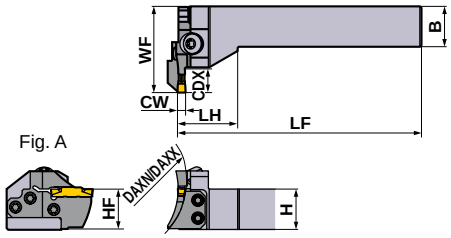


Fig. A

Right hand tool holder shown.

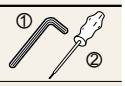
Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
D	.079 .088	1.575	1.969	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-D12-040	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-D12-040	●	A
		1.969	2.362	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-D12-050	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-D12-050	●	A
		2.362	2.953	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-D12-060	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-D12-060	●	A
		2.953	3.937	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-D12-075	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-D12-075	●	A
		3.937	5.906	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-D12-100	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-D12-100	●	A
		5.315	7.874	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-D12-135	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-D12-135	●	A
		7.087	9.843	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-D12-180	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-D12-180	●	A
E	.094 .098 .108	1.575	1.969	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-E12-040	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-E12-040	●	A
		1.969	2.362	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-E12-050	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-E12-050	●	A
		2.362	2.953	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-E12-060	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-E12-060	●	A
		2.953	3.937	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-E12-075	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-E12-075	●	A
		3.937	5.906	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-E12-100	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-E12-100	●	A
		5.315	7.874	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-E12-135	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-E12-135	●	A
		7.087	9.843	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-E12-180	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-E12-180	●	A

*1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.

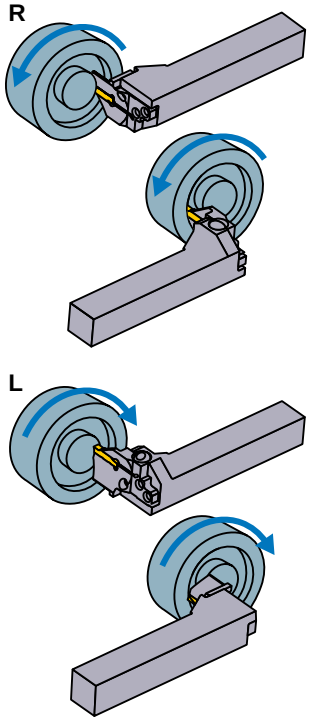
● : Inventory maintained.

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	 Clamp Screw	 5 pcs. Blade Screw	 Wrench *
GYHRUS16D90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

Dimensions (inch) *1						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
1.000	1.000	6.000	1.500	1.000	2.094	R
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	L
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○–Breaker
E	GY○○0239/0250/0274E○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
D	.079", 2.00mm	●	●	●	●
E	.094", 2.39mm	●	●	●	●
	.098", 2.50mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
D	.079", 2.00mm	●	●	●	●
	.088", 2.24mm	●			
E	.094", 2.39mm	●			
	.098", 2.50mm	●	●	●	●
	.108", 2.74mm	●			

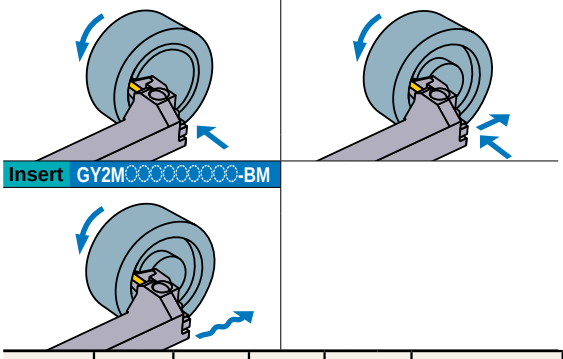
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

GY SERIES (FACE GROOVING)

5-1 90° type holder (inch)

Insert	GY2M○○○○○○○○○-GS/GM	Insert	GY2G○○○○○○○○○-MF
Insert	GY2M○○○○○○○○○-GU	Insert	GY2M○○○○○○○○○-MS
Insert	GY1G○○○○○○○○○-GF/GS	Insert	GY2M○○○○○○○○○-MM
Insert	GY2M○○○○○○○○○-BM		



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

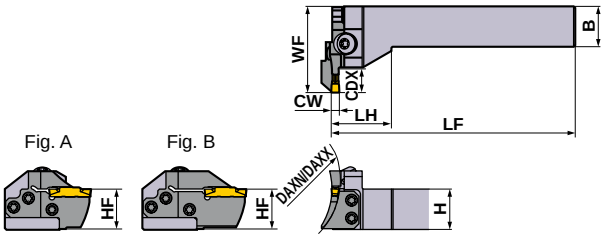


Fig. A Fig. B

Right hand tool holder shown.

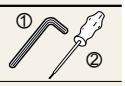
Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	.118 .125 .128	1.378	1.575	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-035	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-035	●	A
		1.575	1.969	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-040	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-040	●	A
		1.969	2.362	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-050	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-050	●	A
		2.362	2.953	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-060	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-060	●	A
				.787✱2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F20-060	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-F20-060	●	B
		2.953	3.937	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-075	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-075	●	A
				.787✱2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F20-075	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-F20-075	●	B
		3.937	5.906	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-100	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-100	●	A
				.787✱2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F20-100	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-F20-100	●	B
		5.315	7.874	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-135	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-135	●	A
				.787✱2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F20-135	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-F20-135	●	B
		7.087	9.843	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-180	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-180	●	A
				.787✱2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F20-180	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-F20-180	●	B
		8.858	39.331	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-225	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-225	●	A
				.787✱2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F20-225	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-F20-225	●	B

✱1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.
✱2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

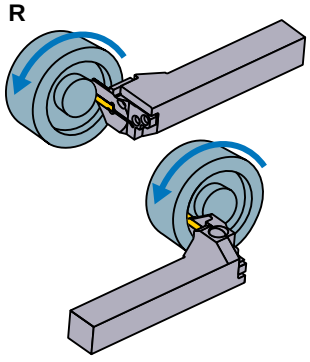
● : Inventory maintained.

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	 Clamp Screw	 5 pcs. Blade Screw	 Wrench *
GYHRUS16D90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

Dimensions (inch) *1						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
1.000	1.000	6.000	1.500	1.000	2.094	R
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.330	



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
F	.118", 3.00mm	●	●	●	●
	.125", 3.18mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
F	.118", 3.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24mm	●			

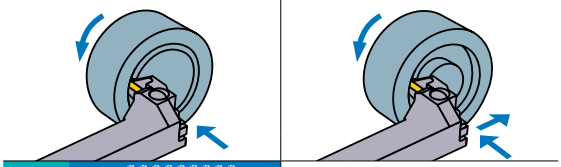
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

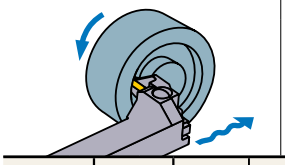
GY SERIES (FACE GROOVING)

5-1 90° type holder (inch)

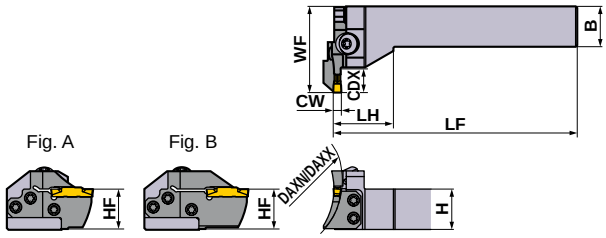
Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

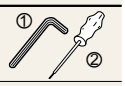
Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
G	.157 .167	1.575	1.969	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G14-040	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-G14-040	●	A
		1.969	2.362	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G14-050	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-G14-050	●	A
		2.362	3.346	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G14-060	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-G14-060	●	A
				.984*2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G25-060	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-G25-060	●	B
		3.346	4.921	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G14-085	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-G14-085	●	A
				.984*2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G25-085	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-G25-085	●	B
		4.921	7.874	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G14-125	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-G14-125	●	A
				.984*2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G25-125	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-G25-125	●	B
		7.087	11.024	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G14-180	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-G14-180	●	A
				.984*2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G25-180	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-G25-180	●	B
		9.843	39.331	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G14-250	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-G14-250	●	A
				.984*2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G25-250	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-G25-250	●	B

*1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.
*2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

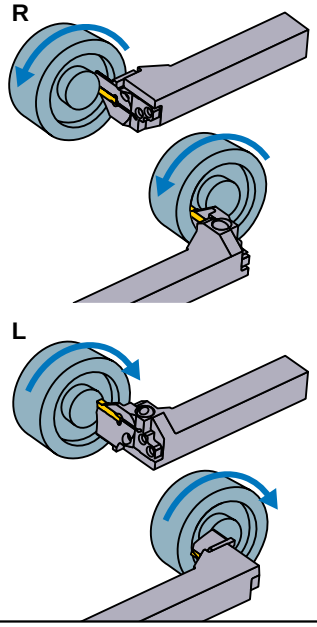
● : Inventory maintained.

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	 Clamp Screw	 5 pcs. Blade Screw	 Wrench *
GYHRUS16D90-M25L **GYHLUS16D90-M25R**	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (inch) *1						Cutting Mode
H	B	LF	LH	HF	WF	
1.000	1.000	6.000	1.500	1.000	2.094	R
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.094	L
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	



Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
G	.157", 4.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
G	.157", 4.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24mm	●			

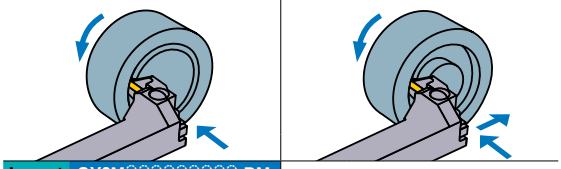
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

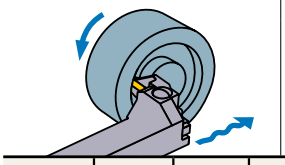
GY SERIES (FACE GROOVING)

5-1 90° type holder (inch)

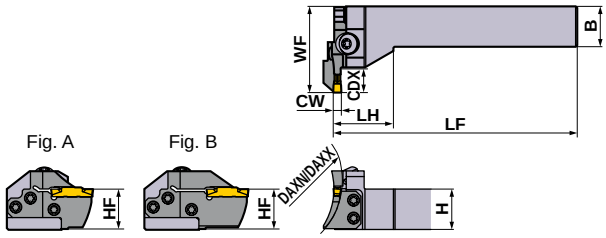
Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

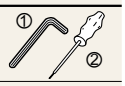
Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	.187 .197 .206	1.969	2.362	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H14-050	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-H14-050	●	A
		2.362	3.346	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H14-060	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-H14-060	●	A
				.984✱2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H25-060	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-H25-060	●	B
		3.346	4.921	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H14-085	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-H14-085	●	A
				.984✱2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H25-085	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-H25-085	●	B
		4.921	7.874	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H14-125	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-H14-125	●	A
				.984✱2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H25-125	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-H25-125	●	B
		7.087	11.024	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H14-180	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-H14-180	●	A
				.984✱2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H25-180	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-H25-180	●	B
		9.843	39.331	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H14-250	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-H14-250	●	A
				.984✱2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H25-250	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-H25-250	●	B

✱1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.
✱2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

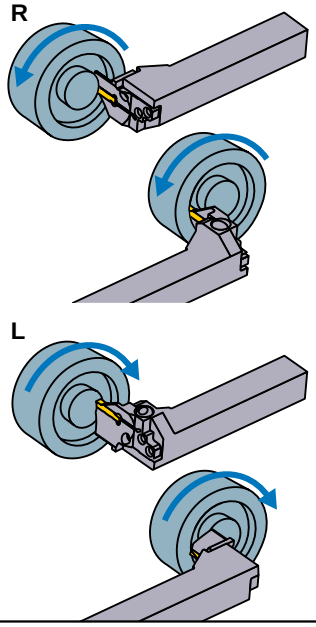
● : Inventory maintained.

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	 Clamp Screw	 5 pcs. Blade Screw	 Wrench *
GYHRUS16D90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

Dimensions (inch) *1						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
1.000	1.000	6.000	1.500	1.000	2.094	R
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	
						L



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
H	.187", 4.75mm	●	●	●	●
	.197", 5.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
H	.187", 4.75mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24mm	●			

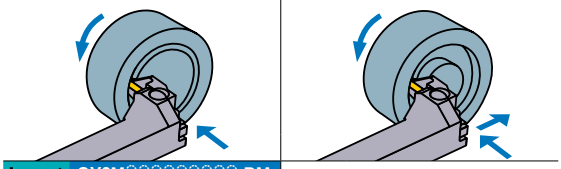
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

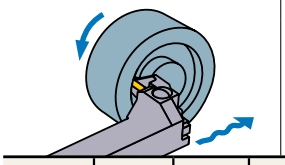
GY SERIES (FACE GROOVING)

5-1 90° type holder (inch)

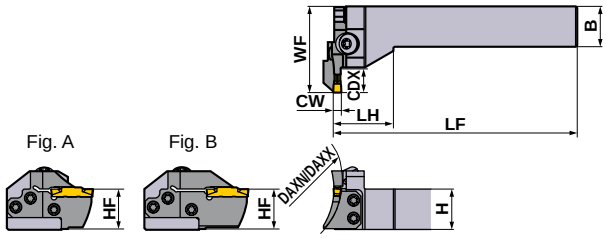
Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

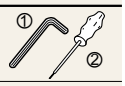
Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
J	.236 .248 .250	1.969	2.756	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J14-050	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-J14-050	●	A
		2.756	4.331	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J14-070	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-J14-070	●	A
				.984*2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J25-070	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-J25-070	●	B
		4.331	7.874	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J14-110	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-J14-110	●	A
				.984*2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J25-110	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-J25-110	●	B
		6.693	11.024	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J14-170	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-J14-170	●	A
				.984*2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J25-170	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-J25-170	●	B
		9.843	39.331	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J14-250	●	A
						L	GYHLUS16D90-M25R	●	GYM25RD-J14-250	●	A
				.984*2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J25-250	●	B
						L	GYHLUS16D90-M25R	●	GYM25RD-J25-250	●	B

*1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.
*2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

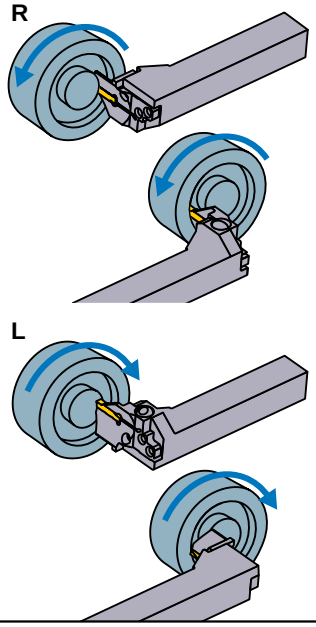
● : Inventory maintained.

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	 Clamp Screw	 5 pcs. Blade Screw	 Wrench *
GYHRUS16D90-M25L **GYHLUS16D90-M25R**	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (inch) *1						Cutting Mode
H	B	LF	LH	HF	WF	
1.000	1.000	6.000	1.500	1.000	2.094	R
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	



Select an Insert

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➤ F013

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
J	.236", 6.00mm	●	●	●	
	.250", 6.35mm	●	●	●	

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
J	.236", 6.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.248", 6.31mm	●			
	.250", 6.35mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			

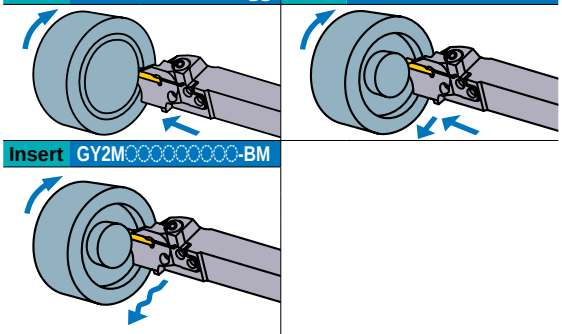
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert	GY2M○○○○○○○○○-GS -GM	Insert	GY2G○○○○○○○○○-MF
Insert	GY2M○○○○○○○○○-GU	Insert	GY2M○○○○○○○○○-MS
Insert	GY1G○○○○○○○○○- GF GS	Insert	GY2M○○○○○○○○○-MM
Insert	GY2M○○○○○○○○○-BM		



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

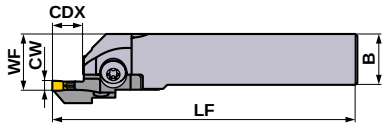


Fig. A

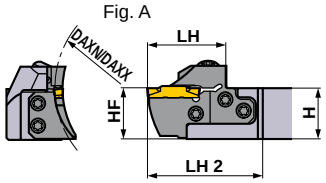
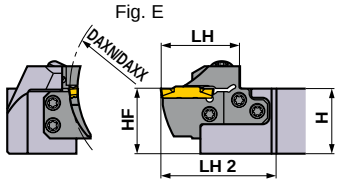


Fig. E



Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
D	2.00 2.24	40	50	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-040	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-D12-040	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-040	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-D12-040	●	A
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-D12-040	●	E
						L	GYHL3225P00-M25L	●	GYM25LD-D12-040	●	E
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-D12-040	●	E
						L	GYHL3232P00-M25L	●	GYM25LD-D12-040	●	E
		50	60	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-050	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-D12-050	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-050	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-D12-050	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-D12-050	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-D12-050	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-D12-050	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-D12-050	●	E
		60	75	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-060	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-D12-060	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-060	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-D12-060	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-D12-060	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-D12-060	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-D12-060	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-D12-060	●	E
		75	100	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-075	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-D12-075	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-075	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-D12-075	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-D12-075	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-D12-075	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-D12-075	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-D12-075	●	E

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : Inventory maintained. ★ : Inventory maintained in Japan.

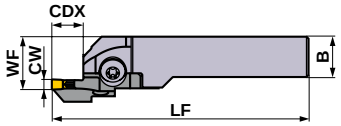
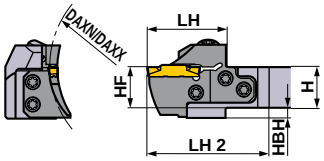


Fig. C



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

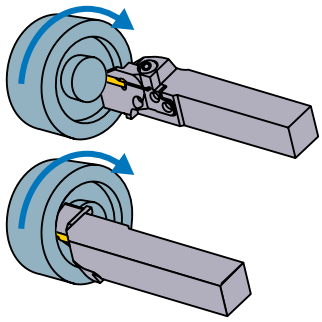
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

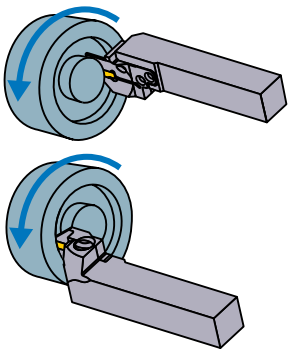
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	–
25	25	150	39	57	25	28	–
32	25	170	39	57	32	28	–
32	25	170	39	57	32	28	–
32	32	170	39	57	32	35	–
32	32	170	39	57	32	35	–
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	–
25	25	150	39	57	25	28	–
32	25	170	39	57	32	28	–
32	25	170	39	57	32	28	–
32	32	170	39	57	32	35	–
32	32	170	39	57	32	35	–
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	–
25	25	150	39	57	25	28	–
32	25	170	39	57	32	28	–
32	25	170	39	57	32	28	–
32	32	170	39	57	32	35	–
32	32	170	39	57	32	35	–
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	–
25	25	150	39	57	25	28	–
32	25	170	39	57	32	28	–
32	25	170	39	57	32	28	–
32	32	170	39	57	32	35	–
32	32	170	39	57	32	35	–

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
D	.079", 2.00mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
D	.079", 2.00mm	●	●	●	●
	.088", 2.24mm	●			

● : Gauge insert shown dimensions

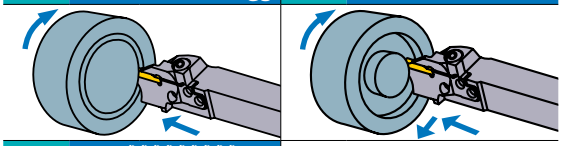
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

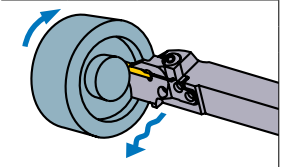
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM | Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU | Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS | Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

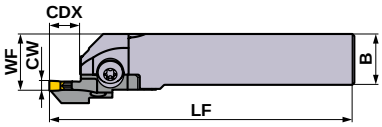


Fig. A

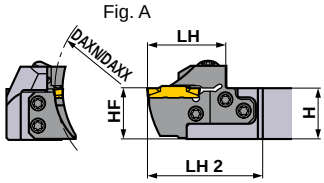
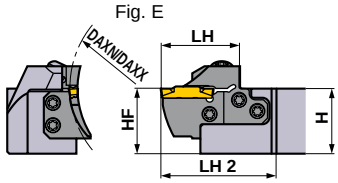


Fig. E



Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
D	2.00 2.24	100	150	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-100	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-D12-100	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-100	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-D12-100	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-D12-100	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-D12-100	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-D12-100	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-D12-100	●	E
		135	200	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-135	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-D12-135	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-135	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-D12-135	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-D12-135	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-D12-135	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-D12-135	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-D12-135	●	E
		180	250	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-180	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-D12-180	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-180	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-D12-180	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-D12-180	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-D12-180	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-D12-180	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-D12-180	●	E

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : Inventory maintained. ★ : Inventory maintained in Japan.

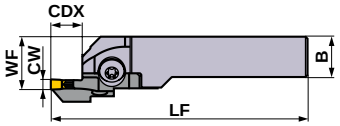
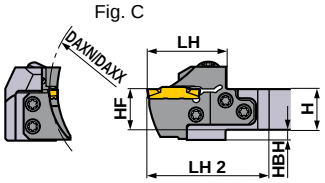


Fig. C



Right hand tool holder shown.

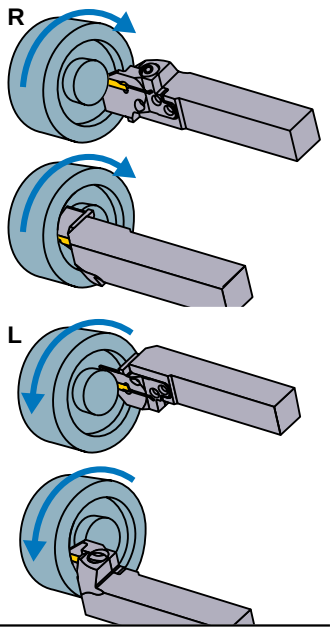
* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) *1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—

Cutting Mode



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
D	.079", 2.00mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
D	.079", 2.00mm	●	●	●	●
	.088", 2.24mm	●			

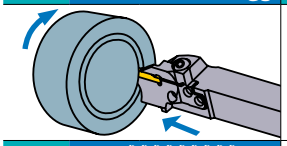
● : Gauge insert shown dimensions

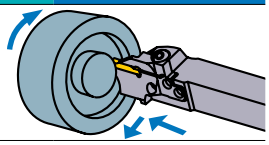
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

GY SERIES (FACE GROOVING)

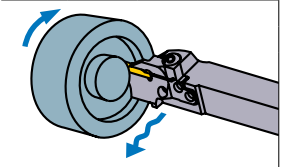
4-2 00° type holder (Metric)

Insert	GY2M○○○○○○○○○-GS/GM	Insert	GY2G○○○○○○○○○-MF
Insert	GY2M○○○○○○○○○-GU	Insert	GY2M○○○○○○○○○-MS
Insert	GY1G○○○○○○○○○-GF/GS	Insert	GY2M○○○○○○○○○-MM





Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

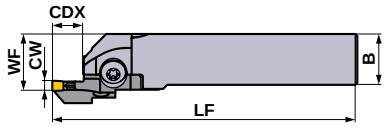


Fig. A

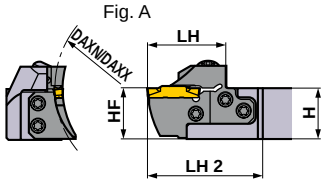
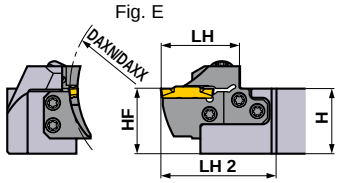


Fig. E



Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
E	2.39 2.50 2.74	40	50	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-040	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-E12-040	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-040	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-E12-040	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-E12-040	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-E12-040	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-E12-040	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-E12-040	●	E
		50	60	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-050	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-E12-050	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-050	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-E12-050	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-E12-050	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-E12-050	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-E12-050	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-E12-050	●	E
		60	75	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-060	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-E12-060	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-060	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-E12-060	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-E12-060	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-E12-060	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-E12-060	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-E12-060	●	E
		75	100	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-075	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-E12-075	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-075	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-E12-075	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-E12-075	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-E12-075	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-E12-075	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-E12-075	●	E

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : Inventory maintained. ★ : Inventory maintained in Japan.

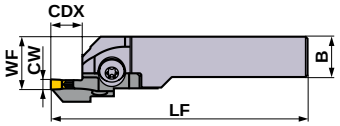
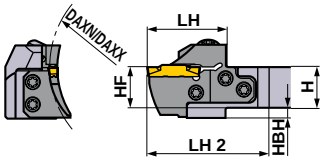


Fig. C



Right hand tool holder shown.

* Wrench : ① : Clamp Screw, ② : Blade Screw

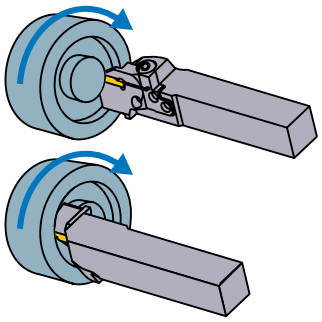
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

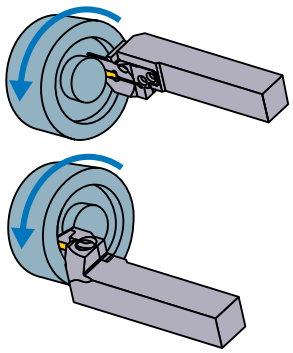
Dimensions (mm) *1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
E	.094", 2.39mm	●	●	●		●
	.098", 2.50mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
E	.094", 2.39mm	●			
	.098", 2.50mm	●	●	●	●
	.108", 2.74mm	●			

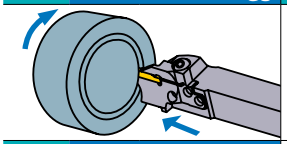
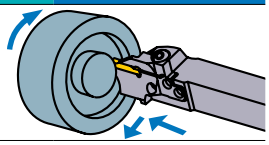
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

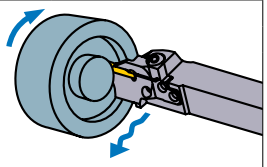
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM | Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU | Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS | Insert GY2M○○○○○○○○○-MM

Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

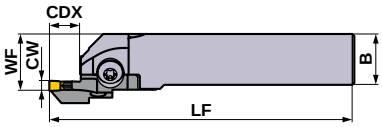


Fig. A

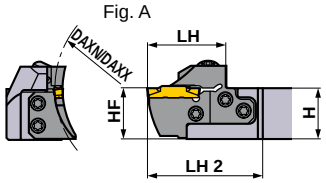
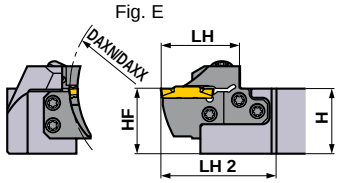


Fig. E



Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
E	2.39 2.50 2.74	100	150	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-100	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-E12-100	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-100	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-E12-100	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-E12-100	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-E12-100	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-E12-100	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-E12-100	●	E
		135	200	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-135	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-E12-135	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-135	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-E12-135	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-E12-135	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-E12-135	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-E12-135	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-E12-135	●	E
		180	250	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-180	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-E12-180	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-180	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-E12-180	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-E12-180	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-E12-180	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-E12-180	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-E12-180	●	E

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : Inventory maintained. ★ : Inventory maintained in Japan.

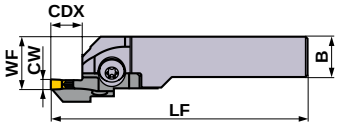
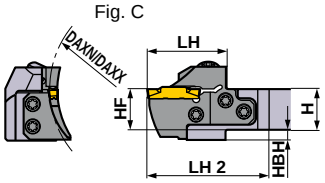


Fig. C



Right hand tool holder shown.

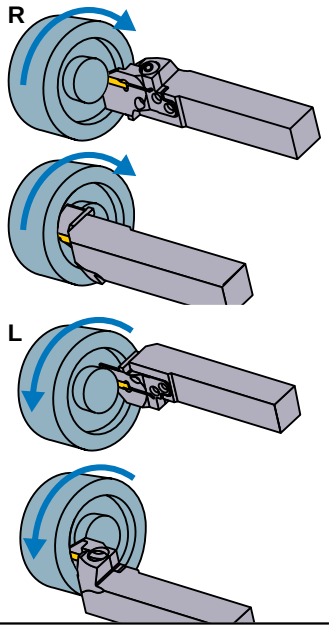
* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) *1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—

Cutting Mode



Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
E	.094", 2.39mm	●	●	●		●
	.098", 2.50mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
E	.094", 2.39mm	●			
	.098", 2.50mm	●	●	●	●
	.108", 2.74mm	●			

● : Gauge insert shown dimensions

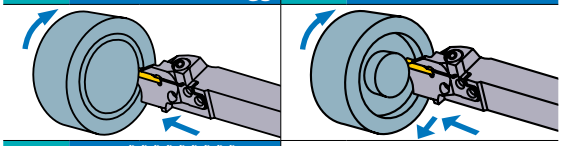
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

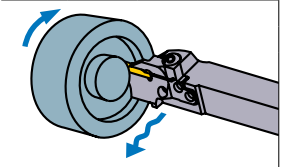
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM | Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU | Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS | Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

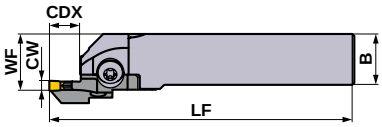


Fig. A

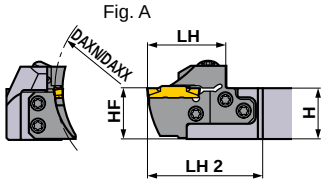
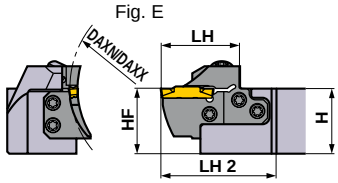


Fig. E



Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	35	40	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-035	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-F12-035	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-035	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-F12-035	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-035	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-F12-035	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-035	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-F12-035	●	E
		40	50	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-040	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-F12-040	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-040	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-F12-040	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-040	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-F12-040	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-040	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-F12-040	●	E
		50	60	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-050	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-F12-050	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-050	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-F12-050	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-050	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-F12-050	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-050	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-F12-050	●	E

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : Inventory maintained. ★ : Inventory maintained in Japan.

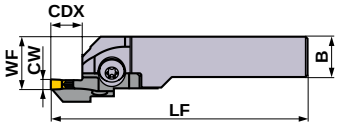
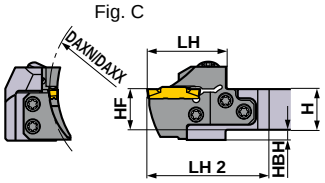


Fig. C



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

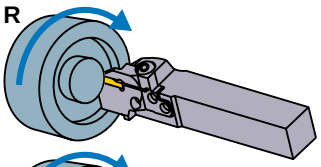
SPARE PARTS

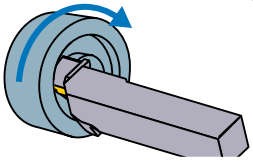
Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) ∗1							
H	**B**	**LF**	**LH**	**LH 2**	**HF**	**WF**	**HBH**
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—

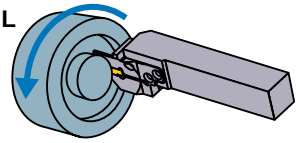
Cutting Mode

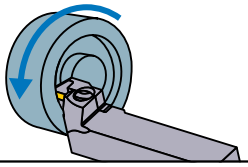
R





L





Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
F	.118", 3.00mm	●	●	●	●
	.125", 3.18mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
F	.118", 3.00mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm			●	
	.125", 3.18mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	.128", 3.24mm	●			

● : Gauge insert shown dimensions

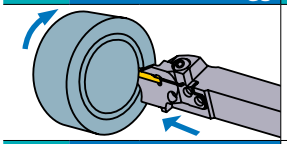
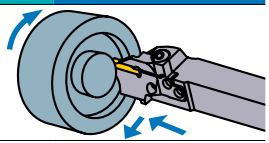
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

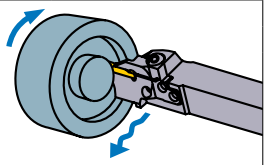
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

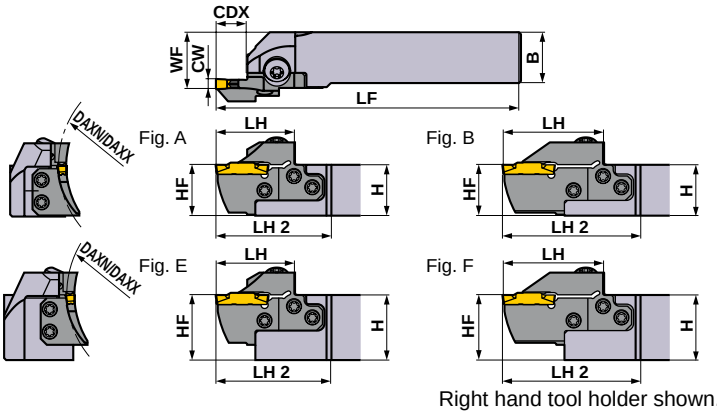
Insert GY2M○○○○○○○○○-GS/-GM | Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU | Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS | Insert GY2M○○○○○○○○○-MM

Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

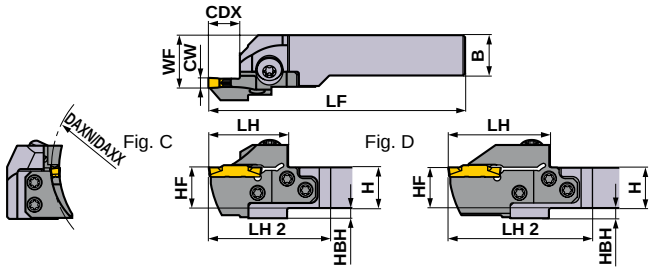


Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	60	75	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-060	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-F12-060	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-060	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-F12-060	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-060	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-F12-060	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-060	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-F12-060	●	E
				20 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-060	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-F20-060	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-060	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-F20-060	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F20-060	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-F20-060	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F20-060	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-F20-060	●	F
		75	100	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-075	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-F12-075	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-075	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-F12-075	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-075	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-F12-075	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-075	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-F12-075	●	E
				20 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-075	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-F20-075	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-075	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-F20-075	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F20-075	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-F20-075	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F20-075	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-F20-075	●	F

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
⁎2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained. ★ : Inventory maintained in Japan.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

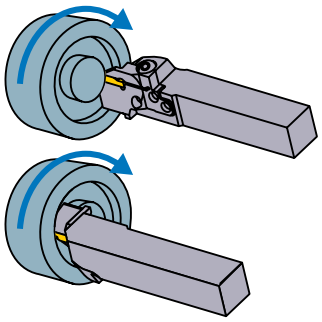
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗ (①, ②)
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

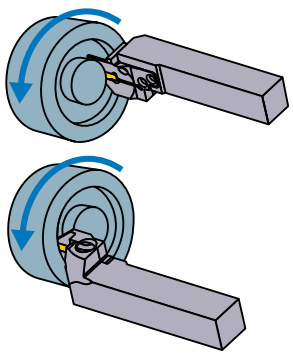
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
F	.118", 3.00mm	●	●	●	●
	.125", 3.18mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
F	.118", 3.00mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm			●	
	.125", 3.18mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	.128", 3.24mm	●			

● : Gauge insert shown dimensions

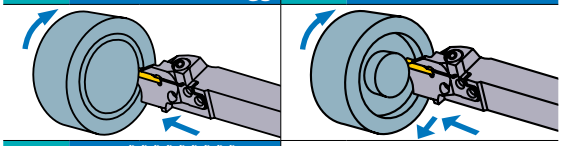
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

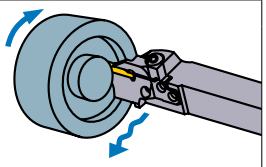
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

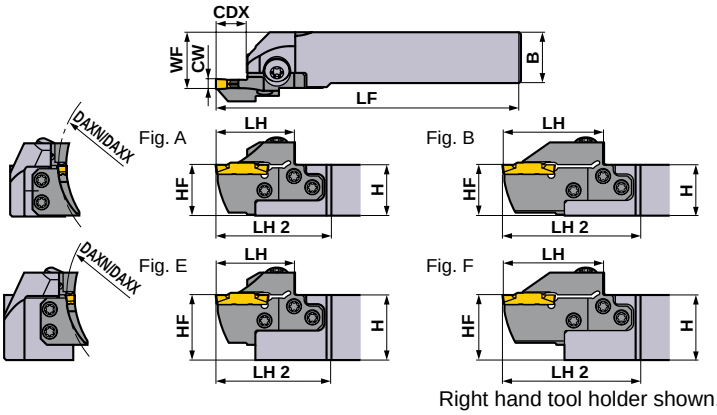
Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



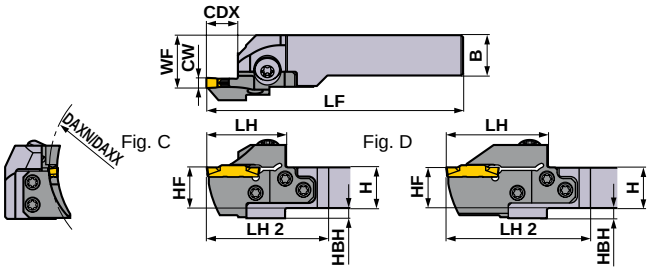
(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	100	150	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-100	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-F12-100	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-100	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-F12-100	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-100	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-F12-100	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-100	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-F12-100	●	E
				20 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-100	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-F20-100	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-100	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-F20-100	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F20-100	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-F20-100	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F20-100	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-F20-100	●	F
		135	200	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-135	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-F12-135	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-135	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-F12-135	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-135	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-F12-135	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-135	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-F12-135	●	E
				20 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-135	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-F20-135	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-135	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-F20-135	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F20-135	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-F20-135	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F20-135	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-F20-135	●	F

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
⁎2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

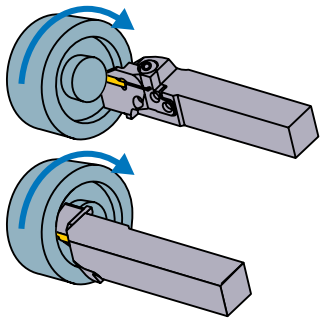
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗ (①, ②)
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

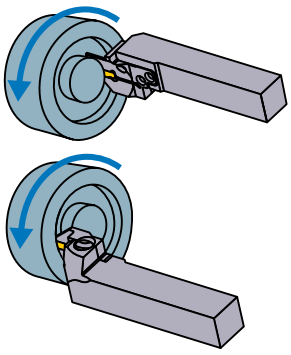
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	–
25	25	150	39	57	25	28	–
32	25	170	39	57	32	28	–
32	25	170	39	57	32	28	–
32	32	170	39	57	32	35	–
32	32	170	39	57	32	35	–
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	–
25	25	156	45	63	25	28	–
32	25	176	45	63	32	28	–
32	25	176	45	63	32	28	–
32	32	176	45	63	32	35	–
32	32	176	45	63	32	35	–
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	–
25	25	150	39	57	25	28	–
32	25	170	39	57	32	28	–
32	25	170	39	57	32	28	–
32	32	170	39	57	32	35	–
32	32	170	39	57	32	35	–
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	–
25	25	156	45	63	25	28	–
32	25	176	45	63	32	28	–
32	25	176	45	63	32	28	–
32	32	176	45	63	32	35	–
32	32	176	45	63	32	35	–

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
F	.118", 3.00mm	●	●	●	●
	.125", 3.18mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
F	.118", 3.00mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm			●	
	.125", 3.18mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	.128", 3.24mm	●			

● : Gauge insert shown dimensions

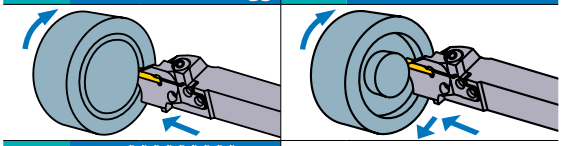
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

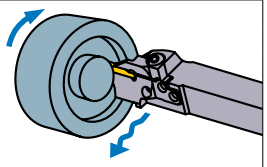
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

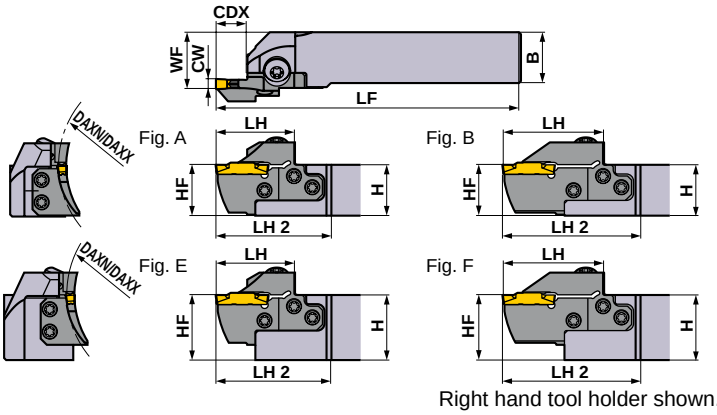
Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

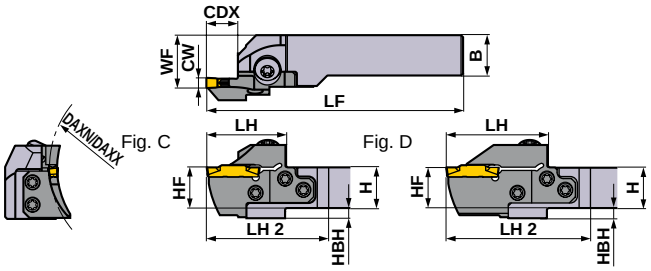


Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	180	250	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-180	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-F12-180	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-180	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-F12-180	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-180	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-F12-180	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-180	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-F12-180	●	E
				20 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-180	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-F20-180	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-180	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-F20-180	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F20-180	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-F20-180	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F20-180	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-F20-180	●	F
		225	999	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-225	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-F12-225	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-225	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-F12-225	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-225	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-F12-225	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-225	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-F12-225	●	E
				20 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-225	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-F20-225	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-225	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-F20-225	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F20-225	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-F20-225	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F20-225	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-F20-225	●	F

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
⁎2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained. ★ : Inventory maintained in Japan.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

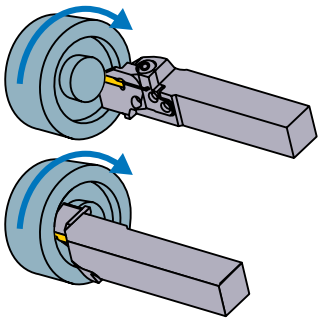
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗ (①, ②)
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

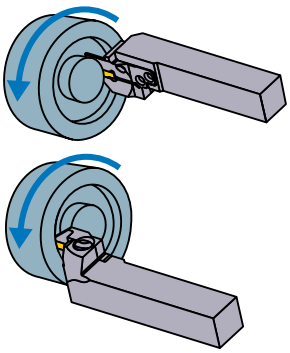
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
F	.118", 3.00mm	●	●	●	●
	.125", 3.18mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
F	.118", 3.00mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm			●	
	.125", 3.18mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	.128", 3.24mm	●			

● : Gauge insert shown dimensions

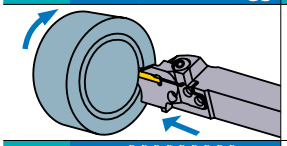
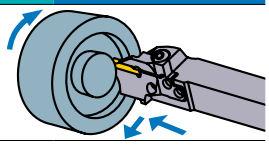
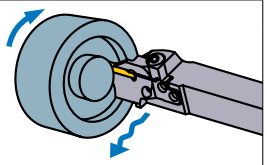
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

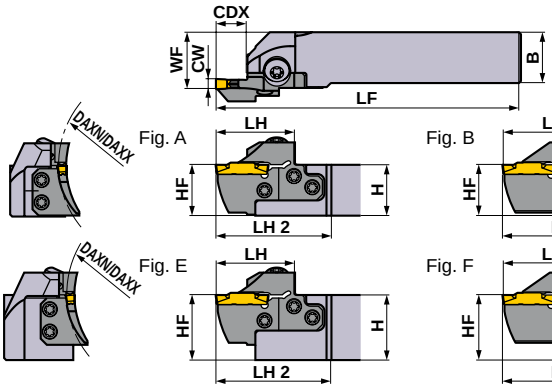
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM


(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

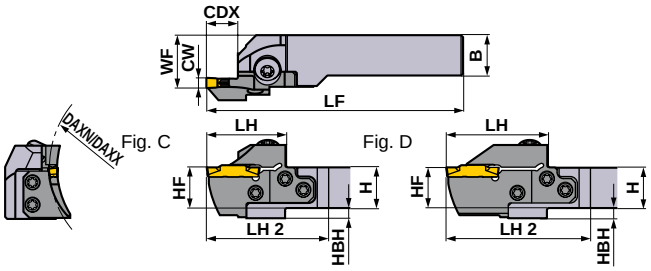


Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
G	4.00 4.24	40	50	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-040	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-G14-040	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-040	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-G14-040	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G14-040	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-G14-040	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G14-040	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-G14-040	●	E
		50	60	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-050	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-G14-050	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-050	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-G14-050	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G14-050	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-G14-050	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G14-050	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-G14-050	●	E
		60	85	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-060	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-G14-060	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-060	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-G14-060	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G14-060	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-G14-060	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G14-060	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-G14-060	●	E
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-060	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-G25-060	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-060	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-G25-060	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G25-060	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-G25-060	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G25-060	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-G25-060	●	F

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained. ★ : Inventory maintained in Japan.



Right hand tool holder shown.

* Wrench : ① : Clamp Screw, ② : Blade Screw

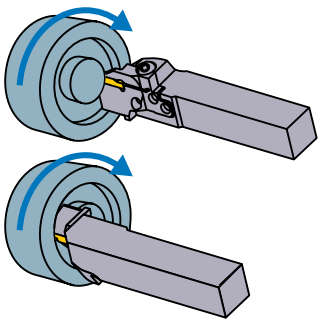
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

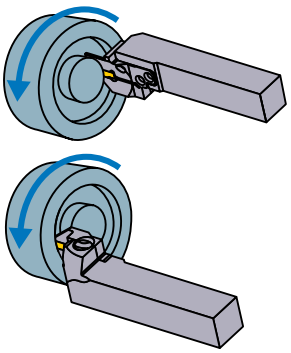
Dimensions (mm) *1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	–
25	25	150	39	57	25	28	–
32	25	170	39	57	32	28	–
32	25	170	39	57	32	28	–
32	32	170	39	57	32	35	–
32	32	170	39	57	32	35	–
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	–
25	25	150	39	57	25	28	–
32	25	170	39	57	32	28	–
32	25	170	39	57	32	28	–
32	32	170	39	57	32	35	–
32	32	170	39	57	32	35	–
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	–
25	25	150	39	57	25	28	–
32	25	170	39	57	32	28	–
32	25	170	39	57	32	28	–
32	32	170	39	57	32	35	–
32	32	170	39	57	32	35	–
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	–
25	25	161	50	68	25	28	–
32	25	181	50	68	32	28	–
32	25	181	50	68	32	28	–
32	32	181	50	68	32	35	–
32	32	181	50	68	32	35	–

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
G	.157", 4.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	Ball nose
G	.157", 4.00mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm	●		●	
	.157", 4.24mm	●			

● : Gauge insert shown dimensions

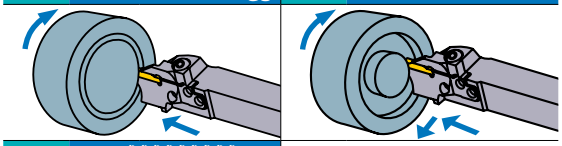
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

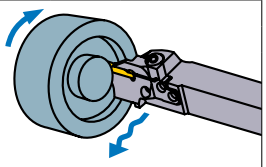
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

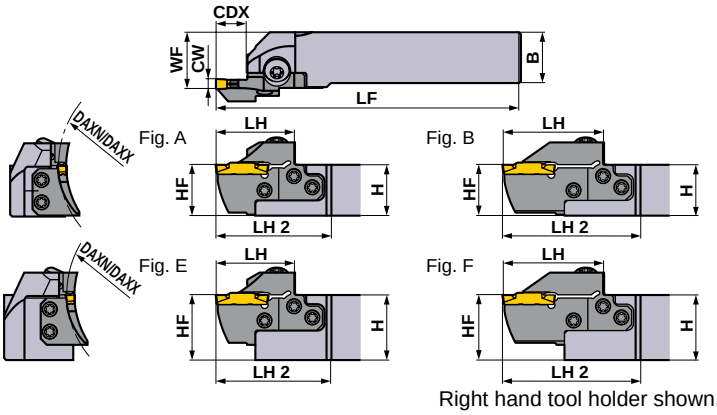
Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

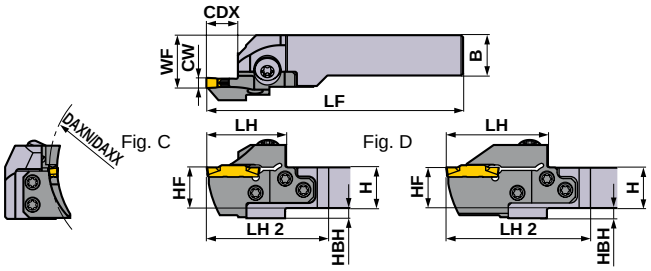


Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
G	4.00 4.24	85	125	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-085	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-G14-085	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-085	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-G14-085	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G14-085	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-G14-085	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G14-085	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-G14-085	●	E
				25 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-085	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-G25-085	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-085	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-G25-085	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G25-085	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-G25-085	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G25-085	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-G25-085	●	F
		125	200	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-125	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-G14-125	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-125	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-G14-125	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G14-125	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-G14-125	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G14-125	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-G14-125	●	E
				25 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-125	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-G25-125	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-125	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-G25-125	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G25-125	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-G25-125	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G25-125	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-G25-125	●	F

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
⁎2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained. ★ : Inventory maintained in Japan.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

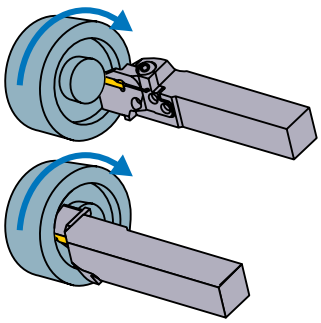
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗ (①, ②)
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

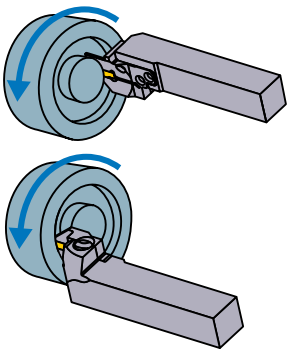
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size \ Breaker CW	GU	GS	GM	GFGS
G .157", 4.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker CW	MF	MS	MM	BM
					Ball nose
G	.157", 4.00mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm	●		●	
	.157", 4.24mm	●			

● : Gauge insert shown dimensions

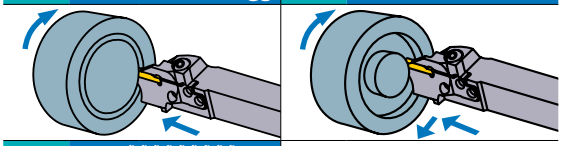
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

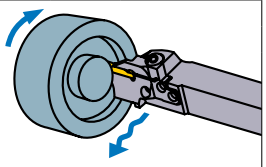
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

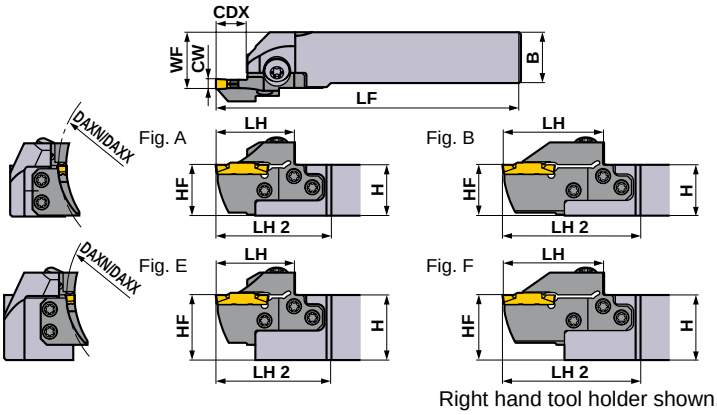
Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

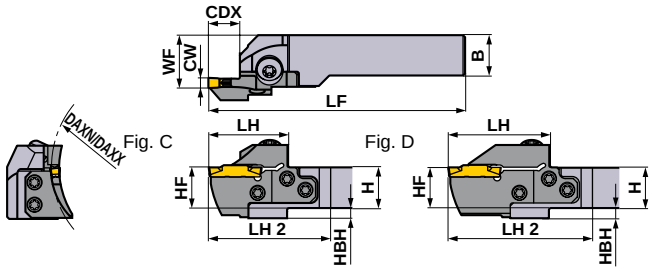


Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
G	4.00 4.24	180	280	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-180	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-G14-180	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-180	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-G14-180	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G14-180	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-G14-180	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G14-180	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-G14-180	●	E
				25 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-180	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-G25-180	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-180	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-G25-180	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G25-180	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-G25-180	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G25-180	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-G25-180	●	F
		250	999	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-250	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-G14-250	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-250	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-G14-250	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G14-250	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-G14-250	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G14-250	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-G14-250	●	E
				25 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-250	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-G25-250	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-250	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-G25-250	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G25-250	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-G25-250	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G25-250	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-G25-250	●	F

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
⁎2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained. ★ : Inventory maintained in Japan.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

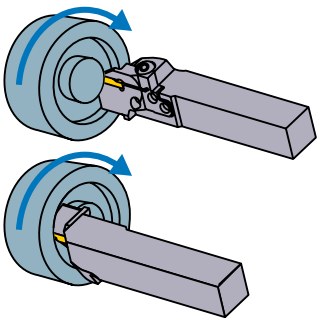
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗ (① ②)
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

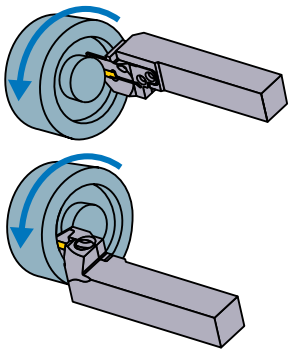
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
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25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
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20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
G	.157", 4.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
G	.157", 4.00mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm	●		●	
	.157", 4.24mm	●			

● : Gauge insert shown dimensions

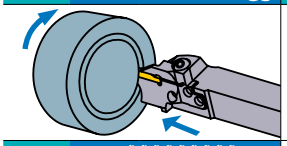
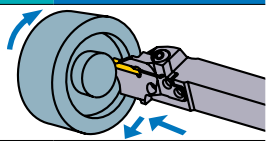
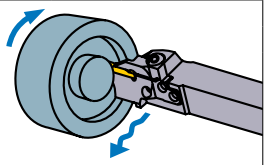
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

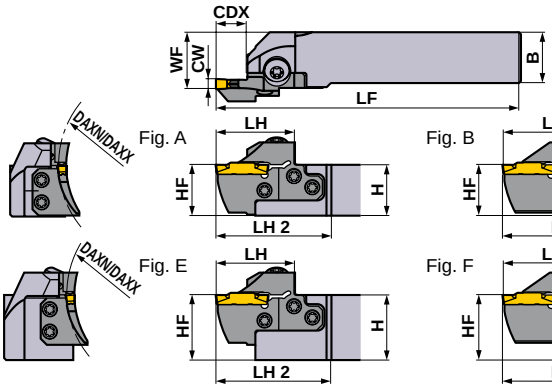
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM


(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

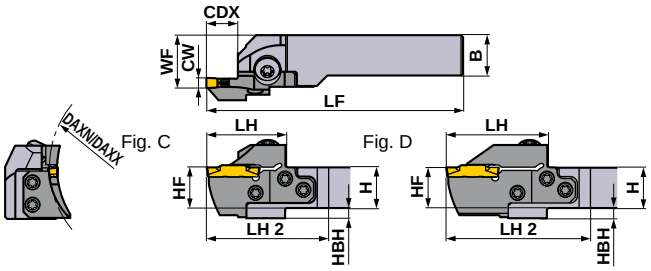


Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	50	60	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-050	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-H14-050	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-050	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-H14-050	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H14-050	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-H14-050	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H14-050	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-H14-050	●	E
		60	85	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-060	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-H14-060	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-060	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-H14-060	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H14-060	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-H14-060	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H14-060	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-H14-060	●	E
				25 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H25-060	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-H25-060	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H25-060	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-H25-060	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H25-060	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-H25-060	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H25-060	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-H25-060	●	F

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
⁎2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained. ★ : Inventory maintained in Japan.



Right hand tool holder shown.

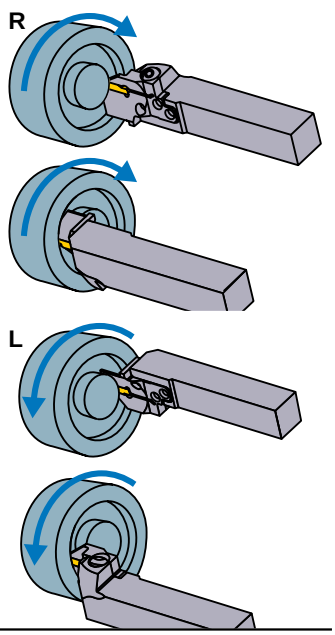
* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) *1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	–
25	25	150	39	57	25	28	–
32	25	170	39	57	32	28	–
32	25	170	39	57	32	28	–
32	32	170	39	57	32	35	–
32	32	170	39	57	32	35	–
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	–
25	25	150	39	57	25	28	–
32	25	170	39	57	32	28	–
32	25	170	39	57	32	28	–
32	32	170	39	57	32	35	–
32	32	170	39	57	32	35	–
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	–
25	25	161	50	68	25	28	–
32	25	181	50	68	32	28	–
32	25	181	50	68	32	28	–
32	32	181	50	68	32	35	–
32	32	181	50	68	32	35	–

Cutting Mode



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
H	.187", 4.75mm	●	●	●	●
	.197", 5.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
H	.187", 4.75mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	RE 0.8mm	●			
	.197", 5.00mm				●
	RE 0.2mm	●			
	RE 0.4mm	●	●	●	
	RE 0.8mm	●	●	●	
	.206", 5.24mm	●			

● : Gauge insert shown dimensions

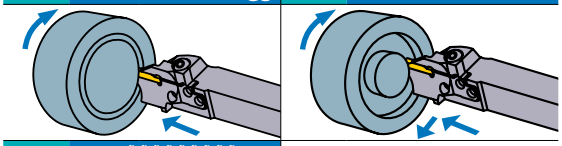
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

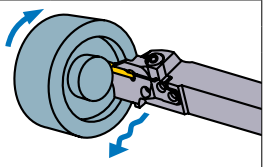
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

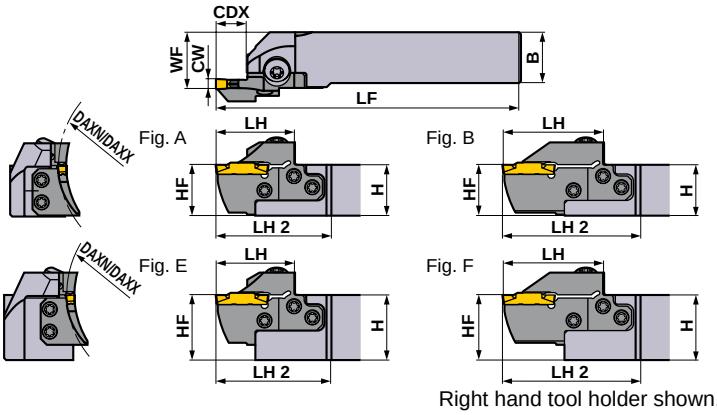
Insert GY2M○○○○○○○○○-GS/-GM | Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU | Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS | Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

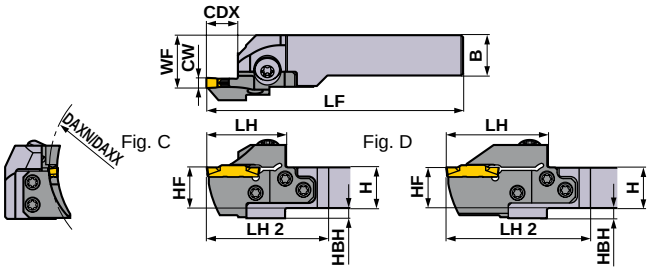


Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	85	125	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-085	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-H14-085	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-085	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-H14-085	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H14-085	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-H14-085	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H14-085	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-H14-085	●	E
				25 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H25-085	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-H25-085	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H25-085	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-H25-085	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H25-085	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-H25-085	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H25-085	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-H25-085	●	F
		125	200	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-125	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-H14-125	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-125	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-H14-125	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H14-125	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-H14-125	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H14-125	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-H14-125	●	E
				25 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H25-125	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-H25-125	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H25-125	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-H25-125	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H25-125	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-H25-125	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H25-125	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-H25-125	●	F

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
⁎2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained. ★ : Inventory maintained in Japan.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

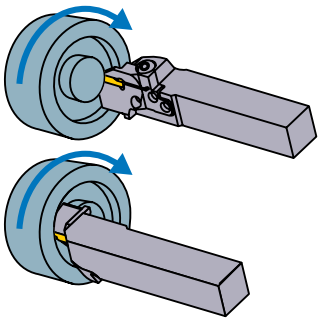
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗ (①, ②)
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

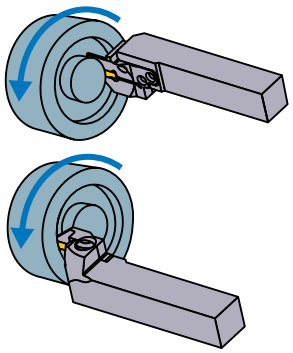
Dimensions (mm) ∗1							
H	**B**	**LF**	**LH**	**LH 2**	**HF**	**WF**	**HBH**
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	–
25	25	150	39	57	25	28	–
32	25	170	39	57	32	28	–
32	25	170	39	57	32	28	–
32	32	170	39	57	32	35	–
32	32	170	39	57	32	35	–
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	–
25	25	161	50	68	25	28	–
32	25	181	50	68	32	28	–
32	25	181	50	68	32	28	–
32	32	181	50	68	32	35	–
32	32	181	50	68	32	35	–
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	–
25	25	150	39	57	25	28	–
32	25	170	39	57	32	28	–
32	25	170	39	57	32	28	–
32	32	170	39	57	32	35	–
32	32	170	39	57	32	35	–
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	–
25	25	161	50	68	25	28	–
32	25	181	50	68	32	28	–
32	25	181	50	68	32	28	–
32	32	181	50	68	32	35	–
32	32	181	50	68	32	35	–

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
H	**GY○○0475/0500/0524H○○○○−Breaker**

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
H	.187", 4.75mm	●	●	●	●
	.197", 5.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
H	.187", 4.75mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	RE 0.8mm	●			
	.197", 5.00mm				●
	RE 0.2mm	●			
	RE 0.4mm	●	●	●	
	RE 0.8mm	●	●	●	
	.206", 5.24mm	●			

● : Gauge insert shown dimensions

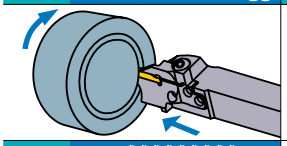
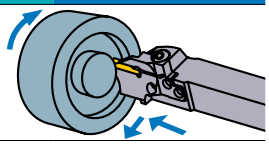
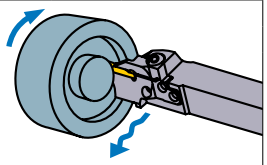
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

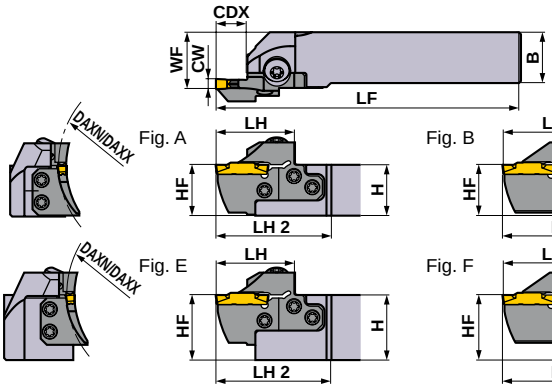
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM


(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

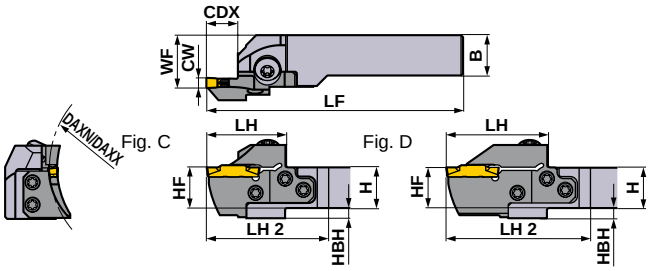


Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	180	280	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-180	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-H14-180	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-180	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-H14-180	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H14-180	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-H14-180	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H14-180	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-H14-180	●	E
				25 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H25-180	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-H25-180	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H25-180	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-H25-180	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H25-180	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-H25-180	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H25-180	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-H25-180	●	F
		250	999	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-250	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-H14-250	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-250	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-H14-250	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H14-250	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-H14-250	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H14-250	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-H14-250	●	E
				25 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H25-250	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-H25-250	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H25-250	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-H25-250	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H25-250	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-H25-250	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H25-250	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-H25-250	●	F

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
⁎2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained. ★ : Inventory maintained in Japan.



Right hand tool holder shown.

* Wrench : ① : Clamp Screw, ② : Blade Screw

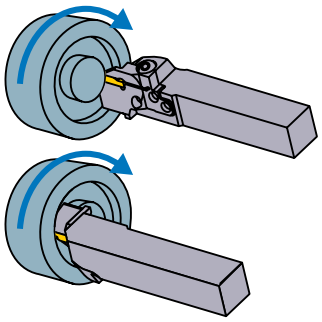
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

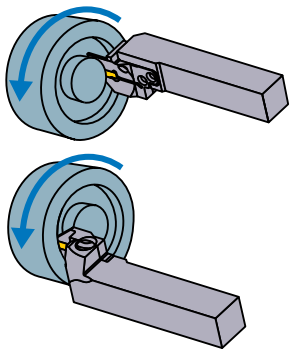
Dimensions (mm) *1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
H	.187", 4.75mm	●	●	●	●
	.197", 5.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
H	.187", 4.75mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	RE 0.8mm	●			
	.197", 5.00mm				●
	RE 0.2mm	●			
	RE 0.4mm	●	●	●	
	RE 0.8mm	●	●	●	
	.206", 5.24mm	●			

● : Gauge insert shown dimensions

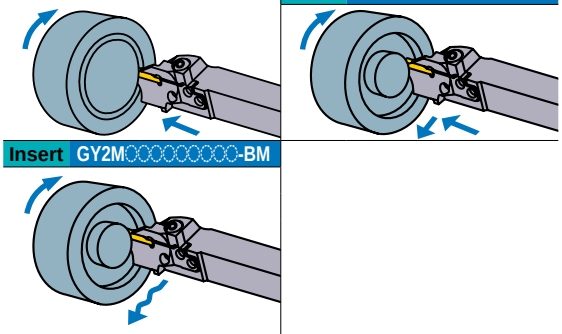
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

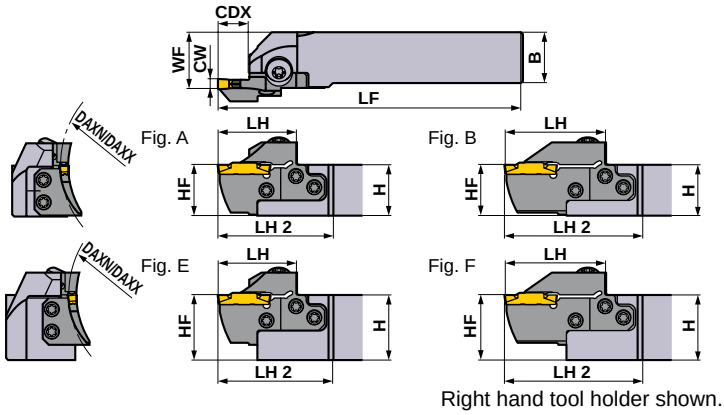
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2M○○○○○○○○○-GU
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

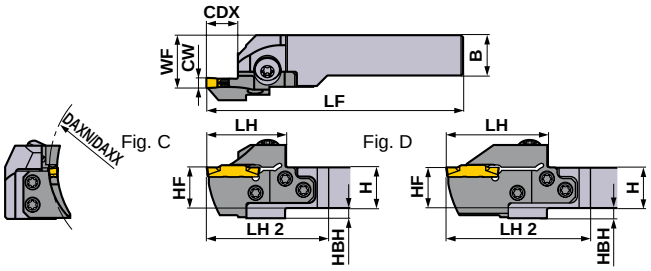


Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
J	6.00 6.31 6.35	50	70	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-050	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-J14-050	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-050	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-J14-050	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J14-050	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-J14-050	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J14-050	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-J14-050	●	E
		70	110	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-070	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-J14-070	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-070	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-J14-070	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J14-070	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-J14-070	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J14-070	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-J14-070	●	E
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J25-070	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-J25-070	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J25-070	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-J25-070	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J25-070	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-J25-070	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J25-070	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-J25-070	●	F
		110	200	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-110	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-J14-110	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-110	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-J14-110	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J14-110	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-J14-110	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J14-110	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-J14-110	●	E
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J25-110	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-J25-110	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J25-110	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-J25-110	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J25-110	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-J25-110	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J25-110	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-J25-110	●	F

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained. ★ : Inventory maintained in Japan.



Right hand tool holder shown.

* Wrench : ① : Clamp Screw, ② : Blade Screw

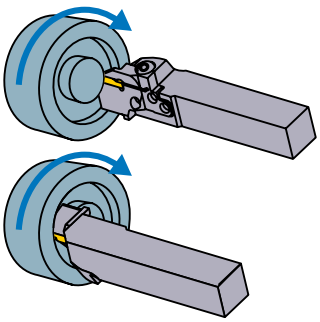
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

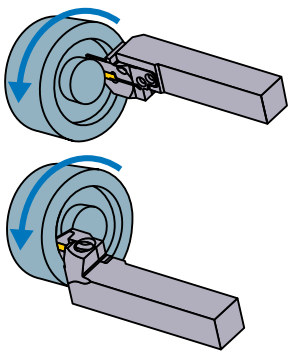
Dimensions (mm) *1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	–
25	25	150	39	57	25	28	–
32	25	170	39	57	32	28	–
32	25	170	39	57	32	28	–
32	32	170	39	57	32	35	–
32	32	170	39	57	32	35	–
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	–
25	25	150	39	57	25	28	–
32	25	170	39	57	32	28	–
32	25	170	39	57	32	28	–
32	32	170	39	57	32	35	–
32	32	170	39	57	32	35	–
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	–
25	25	161	50	68	25	28	–
32	25	181	50	68	32	28	–
32	25	181	50	68	32	28	–
32	32	181	50	68	32	35	–
32	32	181	50	68	32	35	–
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	–
25	25	150	39	57	25	28	–
32	25	170	39	57	32	28	–
32	25	170	39	57	32	28	–
32	32	170	39	57	32	35	–
32	32	170	39	57	32	35	–
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	–
25	25	161	50	68	25	28	–
32	25	181	50	68	32	28	–
32	25	181	50	68	32	28	–
32	32	181	50	68	32	35	–
32	32	181	50	68	32	35	–

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➤ F013

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
J	.236", 6.00mm	●	●	●	
	.250", 6.35mm	●	●	●	

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
J	.236", 6.00mm				●
	RE 0.2mm	●			
	RE 0.4mm	●	●	●	
	RE 0.8mm	●	●	●	
	.248", 6.31mm	●			
	.250", 6.35mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	RE 0.8mm	●			

● : Gauge insert shown dimensions

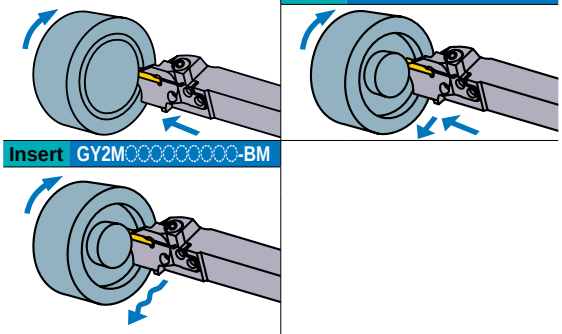
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

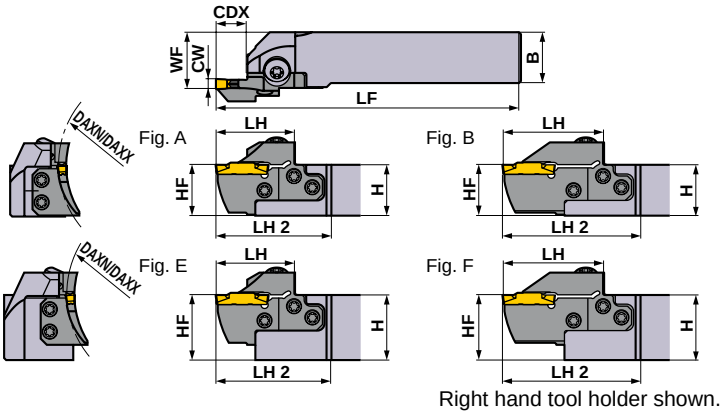
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS -GM
Insert GY2M○○○○○○○○○-GU
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

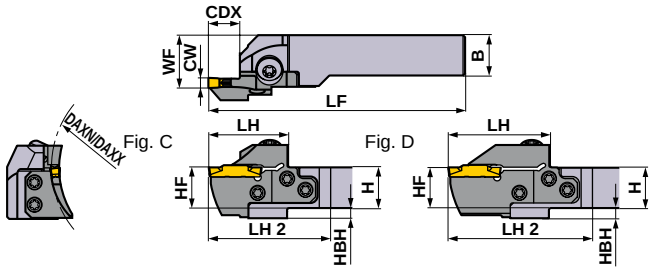


Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
J	6.00 6.31 6.35	170	280	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-170	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-J14-170	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-170	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-J14-170	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J14-170	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-J14-170	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J14-170	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-J14-170	●	E
				25 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J25-170	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-J25-170	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J25-170	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-J25-170	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J25-170	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-J25-170	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J25-170	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-J25-170	●	F
		250	999	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-250	●	C
						L	GYHL2020K00-M25L	●	GYM25LD-J14-250	●	C
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-250	●	A
						L	GYHL2525M00-M25L	●	GYM25LD-J14-250	●	A
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J14-250	●	E
						L	GYHL3225P00-M25L	★	GYM25LD-J14-250	●	E
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J14-250	●	E
						L	GYHL3232P00-M25L	★	GYM25LD-J14-250	●	E
				25 ⁎2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J25-250	●	D
						L	GYHL2020K00-M25L	●	GYM25LD-J25-250	●	D
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J25-250	●	B
						L	GYHL2525M00-M25L	●	GYM25LD-J25-250	●	B
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J25-250	●	F
						L	GYHL3225P00-M25L	★	GYM25LD-J25-250	●	F
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J25-250	●	F
						L	GYHL3232P00-M25L	★	GYM25LD-J25-250	●	F

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
⁎2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained. ★ : Inventory maintained in Japan.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

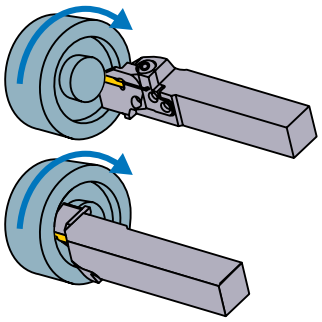
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗ (①, ②)
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

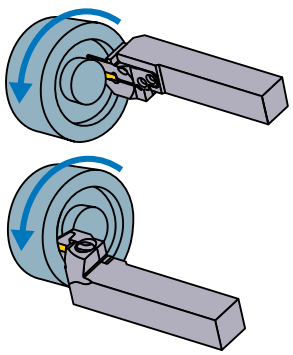
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➤ F013

Seat Size	Breaker / CW	GU	GS	GM	GFGS
J	.236", 6.00mm	●	●	●	
	.250", 6.35mm	●	●	●	

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
J	.236", 6.00mm				●
	RE 0.2mm	●			
	RE 0.4mm	●	●	●	
	RE 0.8mm	●	●	●	
	.248", 6.31mm	●			
	.250", 6.35mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	RE 0.8mm	●			

● : Gauge insert shown dimensions

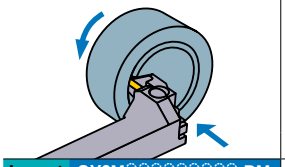
GROOVING

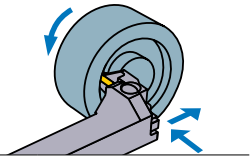
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

GY SERIES (FACE GROOVING)

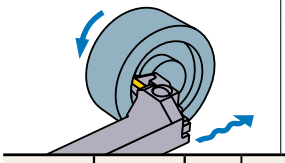
5-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM





Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

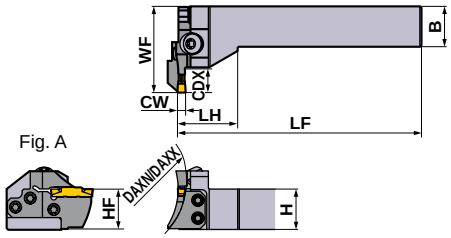


Fig. A

Right hand tool holder shown.

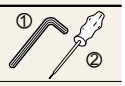
Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number				Fig.
							Holder	Stock	Modular Blade	Stock	
D	2.00 2.24	40	50	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-040	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-D12-040	●	A
		50	60	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-050	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-D12-050	●	A
		60	75	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-060	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-D12-060	●	A
		75	100	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-075	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-D12-075	●	A
		100	150	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-100	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-D12-100	●	A
		135	200	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-135	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-D12-135	●	A
		180	250	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-180	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-D12-180	●	A
E	2.39 2.50 2.74	40	50	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-040	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-E12-040	●	A
		50	60	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-050	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-E12-050	●	A
		60	75	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-060	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-E12-060	●	A
		75	100	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-075	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-E12-075	●	A
		100	150	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-100	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-E12-100	●	A
		135	200	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-135	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-E12-135	●	A
		180	250	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-180	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-E12-180	●	A

*1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.

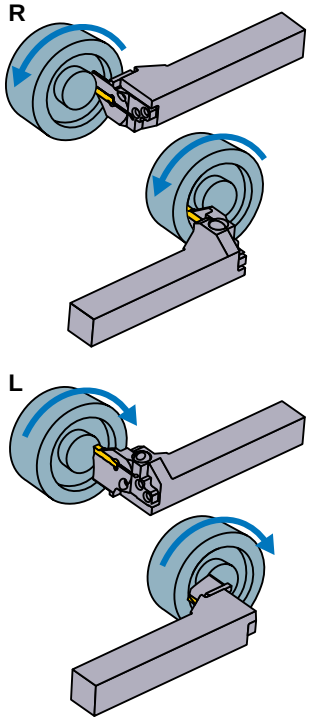
● : Inventory maintained.

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	 Clamp Screw	 5 pcs. Blade Screw	 Wrench *
GYHR2525M90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) *1						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
25	25	150	38	25	53	R
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	L
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○–Breaker
E	GY○○0239/0250/0274E○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker CW	GU	GS	GM	GFGS
D	.079", 2.00mm	●	●	●	●
E	.094", 2.39mm	●	●	●	●
	.098", 2.50mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker CW	MF	MS	MM	BM
					Ball nose
D	.079", 2.00mm	●	●	●	●
	.088", 2.24mm	●			
E	.094", 2.39mm	●			
	.098", 2.50mm	●	●	●	●
	.108", 2.74mm	●			

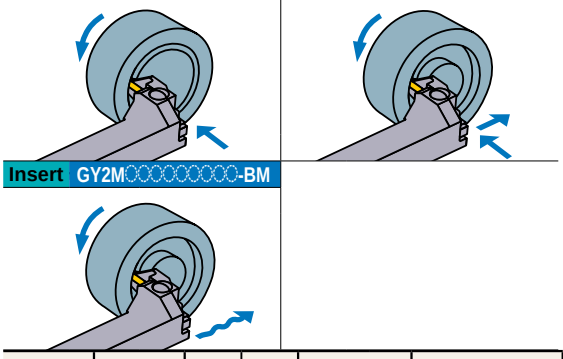
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

GY SERIES (FACE GROOVING)

5-2 90° type holder (Metric)

Insert	GY2M○○○○○○○○○-GS/GM	Insert	GY2G○○○○○○○○○-MF
Insert	GY2M○○○○○○○○○-GU	Insert	GY2M○○○○○○○○○-MS
Insert	GY1G○○○○○○○○○-GF/GS	Insert	GY2M○○○○○○○○○-MM
Insert	GY2M○○○○○○○○○-BM		



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

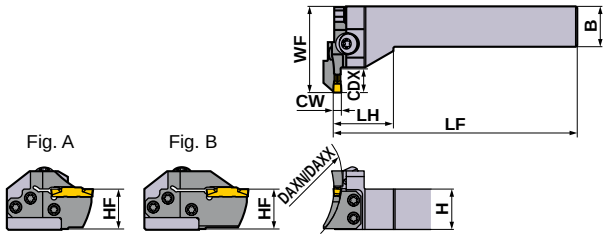


Fig. A

Fig. B

Right hand tool holder shown.

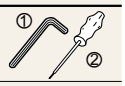
Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	35	40	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-035	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-F12-035	●	A
		40	50	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-040	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-F12-040	●	A
		50	60	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-050	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-F12-050	●	A
		60	75	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-060	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-F12-060	●	A
				20 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-060	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-F20-060	●	B
		75	100	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-075	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-F12-075	●	A
				20 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-075	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-F20-075	●	B
		100	150	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-100	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-F12-100	●	A
				20 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-100	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-F20-100	●	B
		135	200	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-135	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-F12-135	●	A
				20 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-135	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-F20-135	●	B
		180	250	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-180	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-F12-180	●	A
				20 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-180	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-F20-180	●	B
		225	999	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-225	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-F12-225	●	A
				20 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-225	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-F20-225	●	B

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.
⁎2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

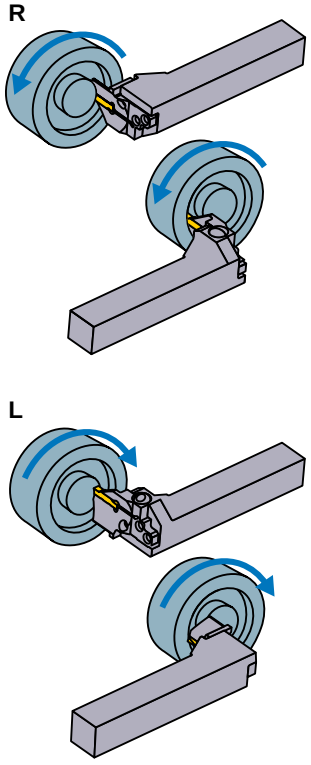
● : Inventory maintained.

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	 Clamp Screw	 5 pcs. Blade Screw	 Wrench *
GYHR2525M90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) *1						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
25	25	150	38	25	53	R
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	59	
25	25	150	38	25	59	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	59	
25	25	150	38	25	59	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	59	L
25	25	150	38	25	59	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	59	
25	25	150	38	25	59	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	59	
25	25	150	38	25	59	



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
F	.118", 3.00mm	●	●	●	●
	.125", 3.18mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
F	.118", 3.00mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm			●	
	.125", 3.18mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	.128", 3.24mm	●			

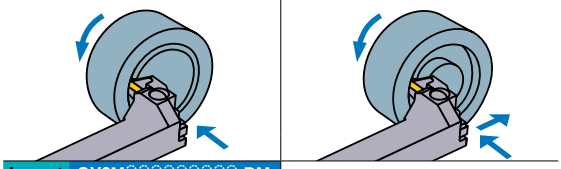
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

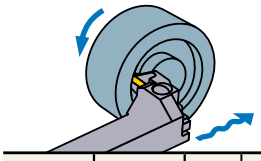
GY SERIES (FACE GROOVING)

5-2 90° type holder (Metric)

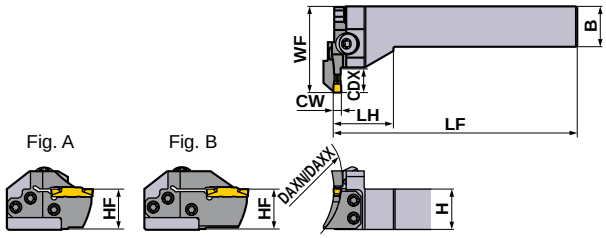
Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
G	4.00 4.24	40	50	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-040	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-G14-040	●	A
		50	60	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-050	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-G14-050	●	A
		60	85	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-060	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-G14-060	●	A
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-060	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-G25-060	●	B
		85	125	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-085	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-G14-085	●	A
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-085	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-G25-085	●	B
		125	200	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-125	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-G14-125	●	A
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-125	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-G25-125	●	B
		180	280	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-180	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-G14-180	●	A
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-180	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-G25-180	●	B
		250	999	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-250	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-G14-250	●	A
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-250	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-G25-250	●	B

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.
⁎2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

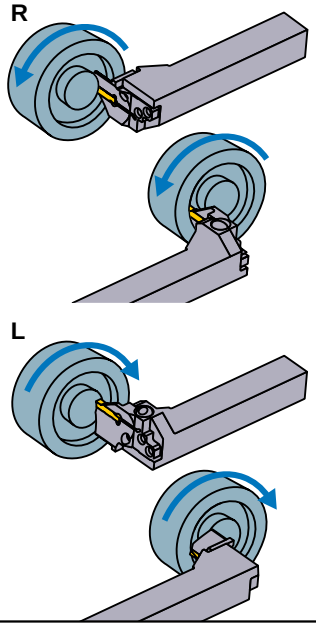
● : Inventory maintained.

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench *
GYHR2525M90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) *1						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
25	25	150	38	25	53	R
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	L
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	



Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
G	.157", 4.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
G	.157", 4.00mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm	●		●	
	.167", 4.24mm	●			

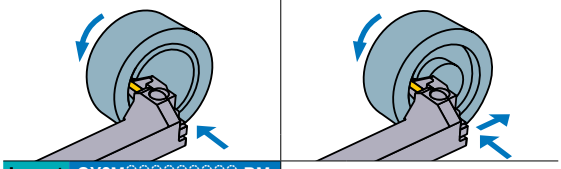
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

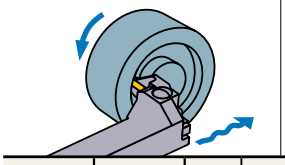
GY SERIES (FACE GROOVING)

5-2 90° type holder (Metric)

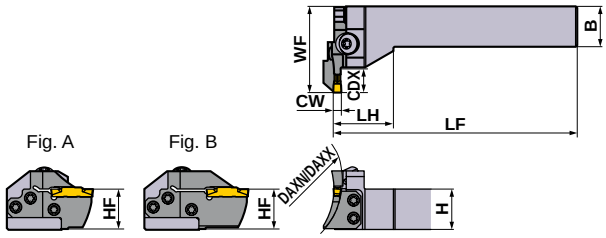
Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

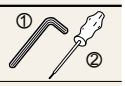
Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	50	60	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-050	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-H14-050	●	A
		60	85	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-060	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-H14-060	●	A
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-060	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-H25-060	●	B
		85	125	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-085	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-H14-085	●	A
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-085	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-H25-085	●	B
		125	200	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-125	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-H14-125	●	A
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-125	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-H25-125	●	B
		180	280	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-180	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-H14-180	●	A
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-180	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-H25-180	●	B
		250	999	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-250	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-H14-250	●	A
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-250	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-H25-250	●	B

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.
⁎2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

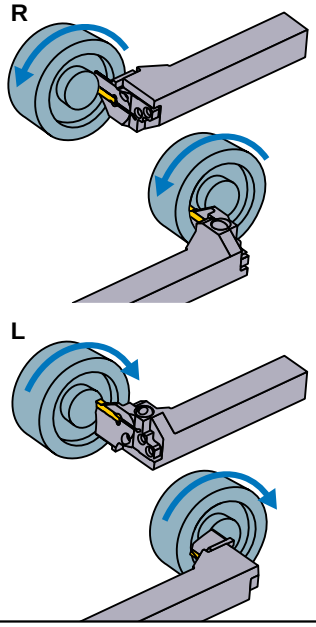
● : Inventory maintained.

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	 Clamp Screw	 5 pcs. Blade Screw	 Wrench *
GYHR2525M90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) *1						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
25	25	150	38	25	53	R
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	L
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
H	.187", 4.75mm	●	●	●	●
	.197", 5.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
H	.187", 4.75mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	RE 0.8mm	●			
	.197", 5.00mm				●
	RE 0.2mm	●			
	RE 0.4mm	●	●	●	
	RE 0.8mm	●	●	●	
	.206", 5.24mm	●			

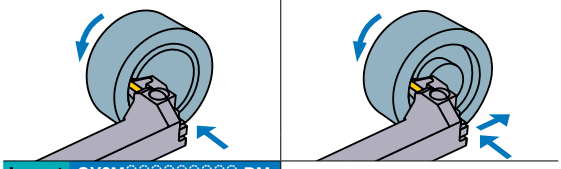
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

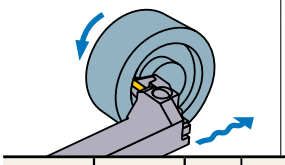
GY SERIES (FACE GROOVING)

5-2 90° type holder (Metric)

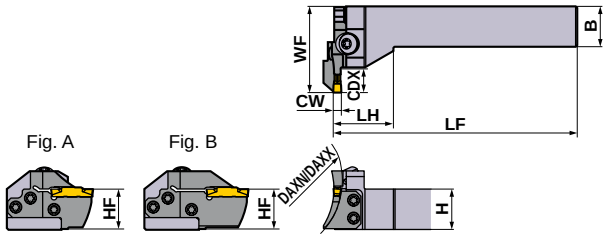
Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

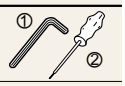
Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
J	6.00 6.31 6.35	50	70	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-050	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-J14-050	●	A
		70	110	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-070	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-J14-070	●	A
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J25-070	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-J25-070	●	B
		110	200	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-110	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-J14-110	●	A
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J25-110	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-J25-110	●	B
		170	280	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-170	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-J14-170	●	A
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J25-170	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-J25-170	●	B
		250	999	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-250	●	A
						L	GYHL2525M90-M25R	●	GYM25RD-J14-250	●	A
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J25-250	●	B
						L	GYHL2525M90-M25R	●	GYM25RD-J25-250	●	B

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.
⁎2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.

● : Inventory maintained.

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	 Clamp Screw	 5 pcs. Blade Screw	 Wrench *
GYHR2525M90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) *1						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
25	25	150	38	25	53	R
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	L
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	

Select an Insert

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➤ F013

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
J	.236", 6.00mm	●	●	●	
	.250", 6.35mm	●	●	●	

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
J	.236", 6.00mm				●
	RE 0.2mm	●			
	RE 0.4mm	●	●	●	
	RE 0.8mm	●	●	●	
	.248", 6.31mm	●			
	.250", 6.35mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	RE 0.8mm	●			

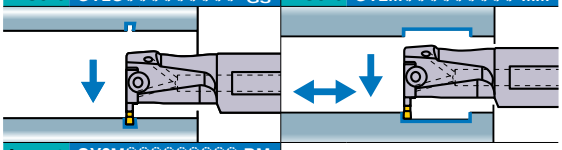
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F216
INSTRUCTION MANUAL ➤ F218

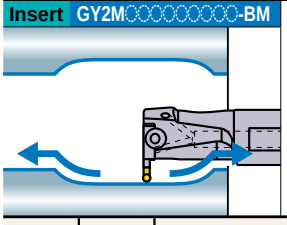
GY SERIES (INTERNAL GROOVING)

6-1 90° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM | Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU | Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS | Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

●Mono block type (Air / coolant through)

Fig. A

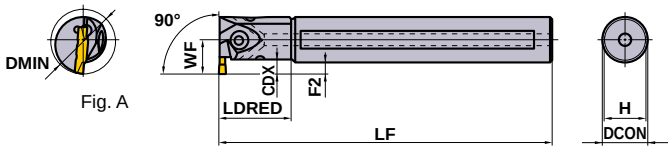
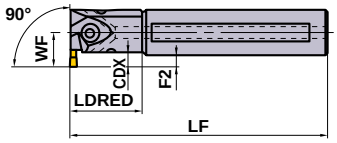


Fig. B



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch) ✶3	DMIN (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
D	.079 .088	.236	1.000	Mono Block	R	GYARUS12K90A-D06	●	—	—	A
					L	GYALUS12K90A-D06	●	—	—	A
				Mono Block	R	GYARUS12Q90A-D06	●	—	—	B
					L	GYALUS12Q90A-D06	●	—	—	B
			1.250	Mono Block	R	GYARUS16K90B-D06	●	—	—	A
					L	GYALUS16K90B-D06	●	—	—	A
				Mono Block	R	GYARUS16R90B-D06	●	—	—	B
					L	GYALUS16R90B-D06	●	—	—	B
		.157—.374 ✶1	1.625	Modular	R	GYDRUS20L90C-M20L	●	GYM20LA-D10	●	C
					L	GYDLUS20L90C-M20R	●	GYM20RA-D10	●	C
				Modular	R	GYDRUS20S90C-M20L	●	GYM20LA-D10	●	D
					L	GYDLUS20S90C-M20R	●	GYM20RA-D10	●	D
		.217—.374 ✶1	2.000	Modular	R	GYDRUS24M90D-M20L	●	GYM20LA-D10	●	C
					L	GYDLUS24M90D-M20R	●	GYM20RA-D10	●	C
				Modular	R	GYDRUS24T90D-M20L	●	GYM20LA-D10	●	D
					L	GYDLUS24T90D-M20R	●	GYM20RA-D10	●	D
		.276—.453 ✶1	2.500	Modular	R	GYDRUS24M90D-M25L	●	GYM25LA-D12	●	C
					L	GYDLUS24M90D-M25R	●	GYM25RA-D12	●	C
				Modular	R	GYDRUS24T90D-M25L	●	GYM25LA-D12	●	D
					L	GYDLUS24T90D-M25R	●	GYM25RA-D12	●	D
			2.750	Modular	R	GYDRUS32P90F-M25L	●	GYM25LA-D12	●	C
					L	GYDLUS32P90F-M25R	●	GYM25RA-D12	●	C
				Modular	R	GYDRUS32T90F-M25L	●	GYM25LA-D12	●	D
					L	GYDLUS32T90F-M25R	●	GYM25RA-D12	●	D

✶1 The maximum groove depth varies according to the cutting diameter (**DMIN**). For details, please refer to page F224.
✶2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF, LDRED, WF** and **F2** values may vary.
✶3 The maximum groove depth (**CDX**) is a value within the dimension (**LDRED**).

● : Inventory maintained.

●Modular blade type (Air / coolant through)

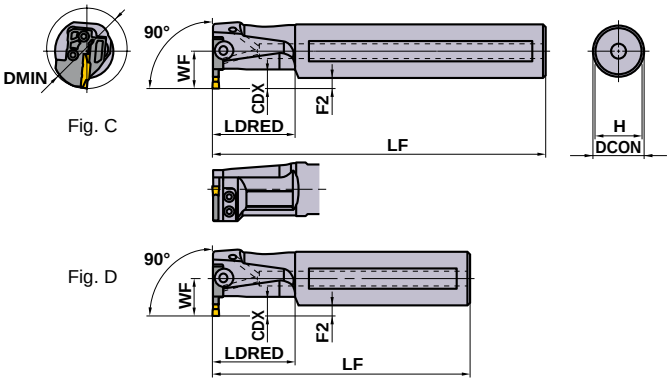


Fig. C

Fig. D

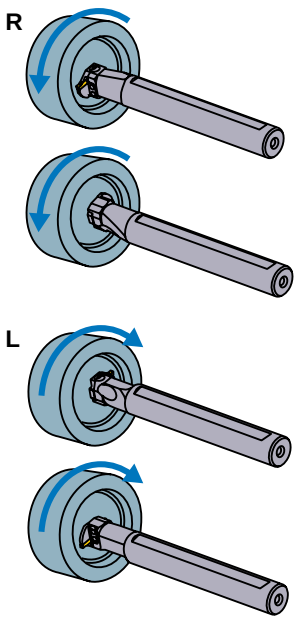
Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ∗
GYAR/LUS12◌90A-◌06	①GY05016S (Clamp Torque : 44 lbf-in)	–	①TKY20R
GYAR/LUS16◌90B-◌06			
GYDR/LUS20◌90C-M20L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/LUS24◌90D-M20L/R			
GYDR/LUS24◌90D-M25L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYDR/LUS32◌90F-M25L/R			

Dimensions (inch) ∗2						Cutting Mode
DCON	LF	LDRED	WF	F2	H	
.750	5.000	1.250	.605	.230	.671	R
.750	5.000	1.250	.605	.230	.671	
.750	7.000	1.250	.605	.230	.671	
.750	7.000	1.250	.605	.230	.671	
1.000	5.000	1.500	.730	.230	.921	
1.000	5.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.250	5.500	2.000	.875	.250	1.171	
1.250	5.500	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	



Select an Insert

Seat Size	Insert Number
D	GY◌◌0200/0224D◌◌◌◌–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
D	.079", 2.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
D	.079", 2.00mm	●	●	●	●
	.088", 2.24mm	●			

● : Gauge insert shown dimensions

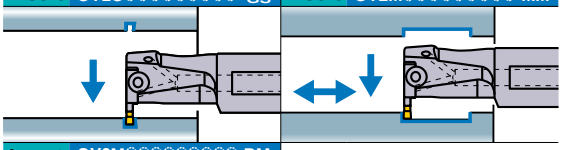
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F224
INSTRUCTION MANUAL ➤ F226

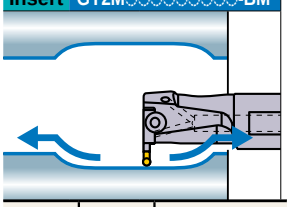
GY SERIES (INTERNAL GROOVING)

6-1 90° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM

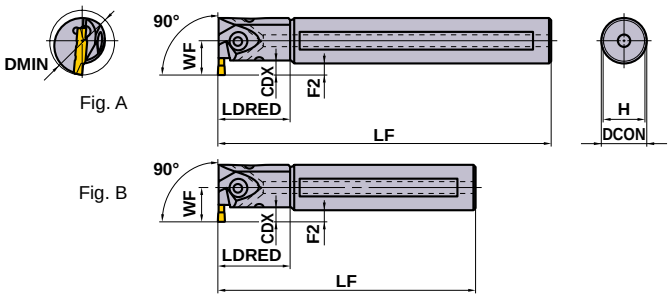


Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

●Mono block type (Air / coolant through)



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch) ✶3	DMIN (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
E	.094 .098 .108	.236	1.000	Mono Block	R	GYARUS12K90A-E06	●	—	—	A
					L	GYALUS12K90A-E06	●	—	—	A
				Mono Block	R	GYARUS12Q90A-E06	●	—	—	B
					L	GYALUS12Q90A-E06	●	—	—	B
			1.250	Mono Block	R	GYARUS16K90B-E06	●	—	—	A
					L	GYALUS16K90B-E06	●	—	—	A
				Mono Block	R	GYARUS16R90B-E06	●	—	—	B
					L	GYALUS16R90B-E06	●	—	—	B
		.157—.374 ✶1	1.625	Modular	R	GYDRUS20L90C-M20L	●	GYM20LA-E10	●	C
					L	GYDLUS20L90C-M20R	●	GYM20RA-E10	●	C
				Modular	R	GYDRUS20S90C-M20L	●	GYM20LA-E10	●	D
					L	GYDLUS20S90C-M20R	●	GYM20RA-E10	●	D
		.217—.374 ✶1	2.000	Modular	R	GYDRUS24M90D-M20L	●	GYM20LA-E10	●	C
					L	GYDLUS24M90D-M20R	●	GYM20RA-E10	●	C
				Modular	R	GYDRUS24T90D-M20L	●	GYM20LA-E10	●	D
					L	GYDLUS24T90D-M20R	●	GYM20RA-E10	●	D
		.276—.453 ✶1	2.500	Modular	R	GYDRUS24M90D-M25L	●	GYM25LA-E12	●	C
					L	GYDLUS24M90D-M25R	●	GYM25RA-E12	●	C
				Modular	R	GYDRUS24T90D-M25L	●	GYM25LA-E12	●	D
					L	GYDLUS24T90D-M25R	●	GYM25RA-E12	●	D
			2.750	Modular	R	GYDRUS32P90F-M25L	●	GYM25LA-E12	●	C
					L	GYDLUS32P90F-M25R	●	GYM25RA-E12	●	C
				Modular	R	GYDRUS32T90F-M25L	●	GYM25LA-E12	●	D
					L	GYDLUS32T90F-M25R	●	GYM25RA-E12	●	D

✶1 The maximum groove depth varies according to the cutting diameter (**DMIN**). For details, please refer to page F224.
✶2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF, LDRED, WF** and **F2** values may vary.
✶3 The maximum groove depth (**CDX**) is a value within the dimension (**LDRED**).

● : Inventory maintained.

●Modular blade type (Air / coolant through)

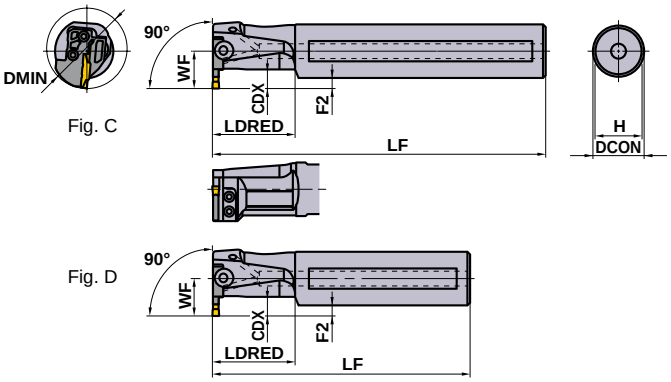


Fig. C

Fig. D

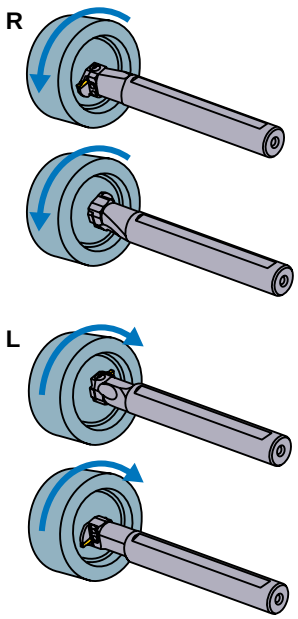
Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ∗
GYAR/LUS12◌90A-◌06	①GY05016S (Clamp Torque : 44 lbf-in)	–	①TKY20R
GYAR/LUS16◌90B-◌06			
GYDR/LUS20◌90C-M20L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/LUS24◌90D-M20L/R			
GYDR/LUS24◌90D-M25L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYDR/LUS32◌90F-M25L/R			

Dimensions (inch) ∗2						Cutting Mode
DCON	LF	LDRED	WF	F2	H	
.750	5.000	1.250	.605	.230	.671	R
.750	5.000	1.250	.605	.230	.671	
.750	7.000	1.250	.605	.230	.671	
.750	7.000	1.250	.605	.230	.671	
1.000	5.000	1.500	.730	.230	.921	
1.000	5.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.250	5.500	2.000	.875	.250	1.171	
1.250	5.500	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.500	6.000	2.500	1.125	.375	1.382	L
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	



Select an Insert

Seat Size	Insert Number
E	GY◌◌0239/0250/0274E◌◌◌◌–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
E	.094", 2.39mm	●	●	●	●
	.098", 2.50mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
E	.094", 2.39mm	●			
	.098", 2.50mm	●	●	●	●
	.108", 2.74mm	●			

● : Gauge insert shown dimensions

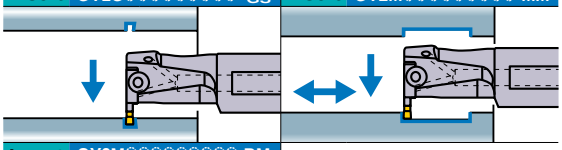
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F224
INSTRUCTION MANUAL ➤ F226

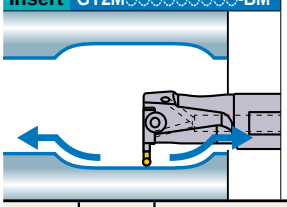
GY SERIES (INTERNAL GROOVING)

6-1 90° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM

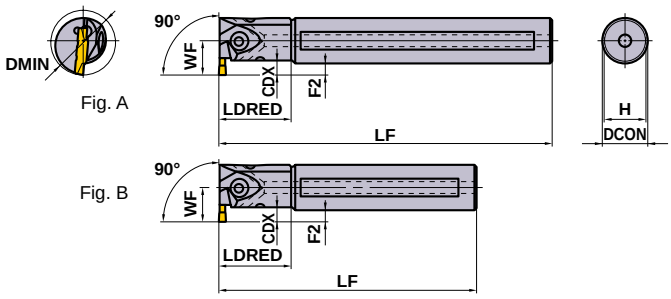


Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

●Mono block type (Air / coolant through)



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch) ✶3	DMIN (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
F	.118 .125 .128	.236	1.000	Mono Block	R	GYARUS12K90A-F06	●	—	—	A
					L	GYALUS12K90A-F06	●	—	—	A
				Mono Block	R	GYARUS12Q90A-F06	●	—	—	B
					L	GYALUS12Q90A-F06	●	—	—	B
			1.250	Mono Block	R	GYARUS16K90B-F06	●	—	—	A
					L	GYALUS16K90B-F06	●	—	—	A
				Mono Block	R	GYARUS16R90B-F06	●	—	—	B
					L	GYALUS16R90B-F06	●	—	—	B
		.157—.374 ✶1	1.625	Modular	R	GYDRUS20L90C-M20L	●	GYM20LA-F10	●	C
					L	GYDLUS20L90C-M20R	●	GYM20RA-F10	●	C
				Modular	R	GYDRUS20S90C-M20L	●	GYM20LA-F10	●	D
					L	GYDLUS20S90C-M20R	●	GYM20RA-F10	●	D
		.217—.374 ✶1	2.000	Modular	R	GYDRUS24M90D-M20L	●	GYM20LA-F10	●	C
					L	GYDLUS24M90D-M20R	●	GYM20RA-F10	●	C
				Modular	R	GYDRUS24T90D-M20L	●	GYM20LA-F10	●	D
					L	GYDLUS24T90D-M20R	●	GYM20RA-F10	●	D
		.276—.453 ✶1	2.500	Modular	R	GYDRUS24M90D-M25L	●	GYM25LA-F12	●	C
					L	GYDLUS24M90D-M25R	●	GYM25RA-F12	●	C
				Modular	R	GYDRUS24T90D-M25L	●	GYM25LA-F12	●	D
					L	GYDLUS24T90D-M25R	●	GYM25RA-F12	●	D
			2.750	Modular	R	GYDRUS32P90F-M25L	●	GYM25LA-F12	●	C
					L	GYDLUS32P90F-M25R	●	GYM25RA-F12	●	C
				Modular	R	GYDRUS32T90F-M25L	●	GYM25LA-F12	●	D
					L	GYDLUS32T90F-M25R	●	GYM25RA-F12	●	D
G	.157 .167	.276	1.250	Mono Block	R	GYARUS16K90B-G07	●	—	—	A
					L	GYALUS16K90B-G07	●	—	—	A
				Mono Block	R	GYARUS16R90B-G07	●	—	—	B
					L	GYALUS16R90B-G07	●	—	—	B
		.197 - .453 ✶1	1.625	Modular	R	GYDRUS20L90C-M20L	●	GYM20LA-G12	●	C
					L	GYDLUS20L90C-M20R	●	GYM20RA-G12	●	C
				Modular	R	GYDRUS20S90C-M20L	●	GYM20LA-G12	●	D
					L	GYDLUS20S90C-M20R	●	GYM20RA-G12	●	D
		.236 - .453 ✶1	2.000	Modular	R	GYDRUS24M90D-M20L	●	GYM20LA-G12	●	C
					L	GYDLUS24M90D-M20R	●	GYM20RA-G12	●	C
				Modular	R	GYDRUS24T90D-M20L	●	GYM20LA-G12	●	D
					L	GYDLUS24T90D-M20R	●	GYM20RA-G12	●	D
		.295 - .512 ✶1	2.750	Modular	R	GYDRUS32P90F-M25L	●	GYM25LA-G14	●	C
					L	GYDLUS32P90F-M25R	●	GYM25RA-G14	●	C
				Modular	R	GYDRUS32T90F-M25L	●	GYM25LA-G14	●	D
					L	GYDLUS32T90F-M25R	●	GYM25RA-G14	●	D
		.315 - .512 ✶1	2.500	Modular	R	GYDRUS24M90D-M25L	●	GYM25LA-G14	●	C
					L	GYDLUS24M90D-M25R	●	GYM25RA-G14	●	C
				Modular	R	GYDRUS24T90D-M25L	●	GYM25LA-G14	●	D
					L	GYDLUS24T90D-M25R	●	GYM25RA-G14	●	D

✶1 The maximum groove depth varies according to the cutting diameter (**DMIN**). For details, please refer to page F224.
✶2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF, LDRED, WF** and **F2** values may vary.
✶3 The maximum groove depth (**CDX**) is a value within the dimension (**LDRED**).

● : Inventory maintained.

●Modular blade type (Air / coolant through)

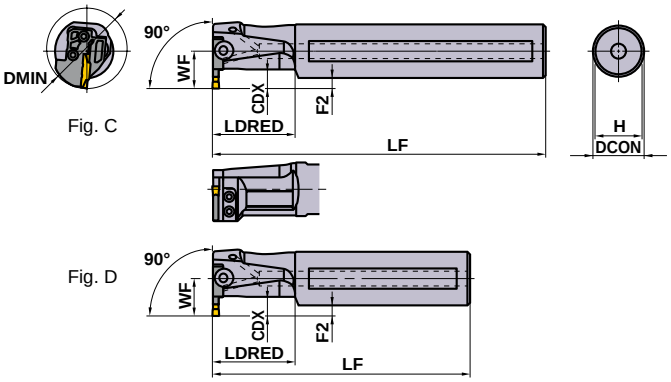


Fig. C

Fig. D

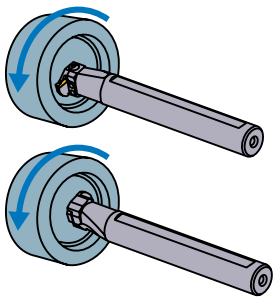
Right hand tool holder shown.

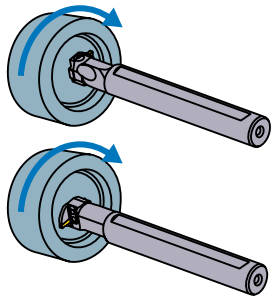
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ∗
GYAR/LUS12◌90A-F06 GYAR/LUS16◌90B-◌◌◌	①GY05016S (Clamp Torque : 44 lbf-in)	–	①TKY20R
GYDR/LUS20◌90C-M20L/R GYDR/LUS24◌90D-M20L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/LUS24◌90D-M25L/R GYDR/LUS32◌90F-M25L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (inch) ∗2						Cutting Mode
DCON	LF	LDRED	WF	F2	H	
.750	5.000	1.250	.605	.230	.671	R
.750	5.000	1.250	.605	.230	.671	
.750	7.000	1.250	.605	.230	.671	
.750	7.000	1.250	.605	.230	.671	
1.000	5.000	1.500	.730	.230	.921	
1.000	5.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.250	5.500	2.000	.875	.250	1.171	
1.250	5.500	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	
1.000	5.000	1.500	.730	.230	.921	L
1.000	5.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.250	5.500	2.000	.875	.250	1.171	
1.250	5.500	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	





Select an Insert

Seat Size	Insert Number
F	GY◌◌0300/0318/0324F◌◌◌◌−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
F	.118", 3.00mm	●	●	●	●
	.125", 3.18mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
F	.118", 3.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24mm	●			

Seat Size	Insert Number
G	GY◌◌0400/0424G◌◌◌◌−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
G	.157", 4.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
G	.157", 4.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24mm	●			

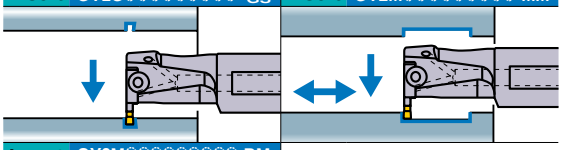
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F224
INSTRUCTION MANUAL ➤ F226

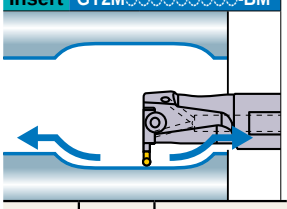
GY SERIES (INTERNAL GROOVING)

6-1 90° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM

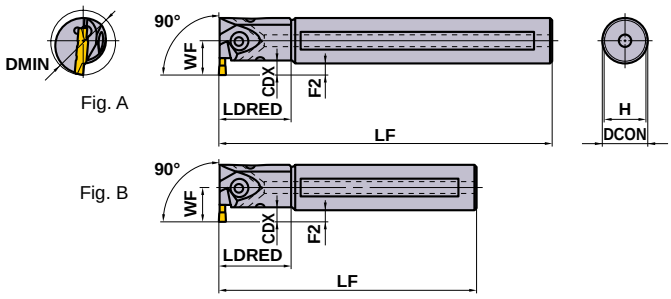


Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

●Mono block type (Air / coolant through)



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch) *3	DMIN (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	.187 .197 .206	.276	1.250	Mono Block	R	GYARUS16K90B-H07	●	—	—	A
					L	GYALUS16K90B-H07	●	—	—	A
				Mono Block	R	GYARUS16R90B-H07	●	—	—	B
					L	GYALUS16R90B-H07	●	—	—	B
		.197 - .453 *1	1.625	Modular	R	GYDRUS20L90C-M20L	●	GYM20LA-H12	●	C
					L	GYDLUS20L90C-M20R	●	GYM20RA-H12	●	C
				Modular	R	GYDRUS20S90C-M20L	●	GYM20LA-H12	●	D
					L	GYDLUS20S90C-M20R	●	GYM20RA-H12	●	D
		.236 - .453 *1	2.000	Modular	R	GYDRUS24M90D-M20L	●	GYM20LA-H12	●	C
					L	GYDLUS24M90D-M20R	●	GYM20RA-H12	●	C
				Modular	R	GYDRUS24T90D-M20L	●	GYM20LA-H12	●	D
					L	GYDLUS24T90D-M20R	●	GYM20RA-H12	●	D
		.295 - .512 *1	2.750	Modular	R	GYDRUS32P90F-M25L	●	GYM25LA-H14	●	C
					L	GYDLUS32P90F-M25R	●	GYM25RA-H14	●	C
				Modular	R	GYDRUS32T90F-M25L	●	GYM25LA-H14	●	D
					L	GYDLUS32T90F-M25R	●	GYM25RA-H14	●	D
		.315 - .512 *1	2.500	Modular	R	GYDRUS24M90D-M25L	●	GYM25LA-H14	●	C
					L	GYDLUS24M90D-M25R	●	GYM25RA-H14	●	C
				Modular	R	GYDRUS24T90D-M25L	●	GYM25LA-H14	●	D
					L	GYDLUS24T90D-M25R	●	GYM25RA-H14	●	D
J	.236 .248 .250	.295 - .512 *1	2.750	Modular	R	GYDRUS32P90F-M25L	●	GYM25LA-J14	●	C
					L	GYDLUS32P90F-M25R	●	GYM25RA-J14	●	C
				Modular	R	GYDRUS32T90F-M25L	●	GYM25LA-J14	●	D
					L	GYDLUS32T90F-M25R	●	GYM25RA-J14	●	D
		.315 - .512 *1	2.500	Modular	R	GYDRUS24M90D-M25L	●	GYM25LA-J14	●	C
					L	GYDLUS24M90D-M25R	●	GYM25RA-J14	●	C
				Modular	R	GYDRUS24T90D-M25L	●	GYM25LA-J14	●	D
					L	GYDLUS24T90D-M25R	●	GYM25RA-J14	●	D

*1 The maximum groove depth varies according to the cutting diameter (**DMIN**). For details, please refer to page F224.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF, LDRED, WF** and **F2** values may vary.
*3 The maximum groove depth (**CDX**) is a value within the dimension (**LDRED**).

● : Inventory maintained.

●Modular blade type (Air / coolant through)

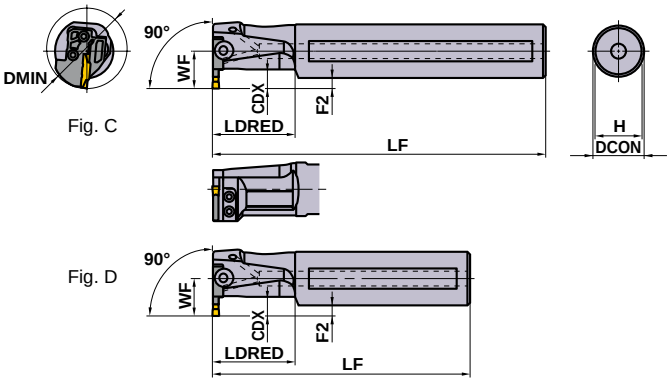


Fig. C

Fig. D

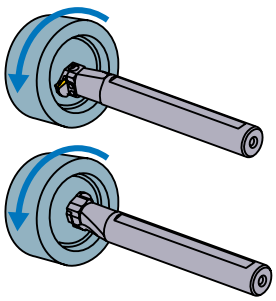
Right hand tool holder shown.

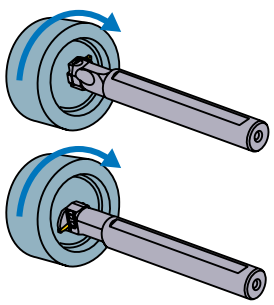
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ∗
GYAR/LUS16○90B-○07	①GY05016S (Clamp Torque : 44 lbf-in)	–	①TKY20R
GYDR/LUS20○90C-M20L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/LUS24○90D-M20L/R			
GYDR/LUS32○90D-M25L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYDR/LUS32○90F-M25L/R			

Dimensions (inch) ∗2						Cutting Mode
DCON	LF	LDRED	WF	F2	H	
1.000	5.000	1.500	.730	.230	.921	R
1.000	5.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.250	5.500	2.000	.875	.250	1.171	
1.250	5.500	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
2.000	6.750	3.250	1.250	.250	1.882	L
2.000	6.750	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	





Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
H	.187", 4.75mm	●	●	●	●
	.197", 5.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
H	.187", 4.75mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24mm	●			

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
J	.236", 6.00mm	●	●	●	
	.250", 6.35mm	●	●	●	

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
J	.236", 6.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.248", 6.31mm	●			
	.250", 6.35mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			

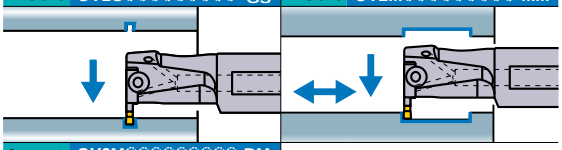
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F224
INSTRUCTION MANUAL ➤ F226

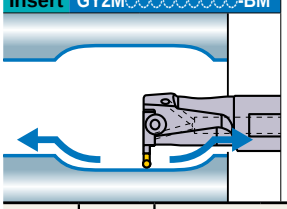
GY SERIES (INTERNAL GROOVING)

6-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM

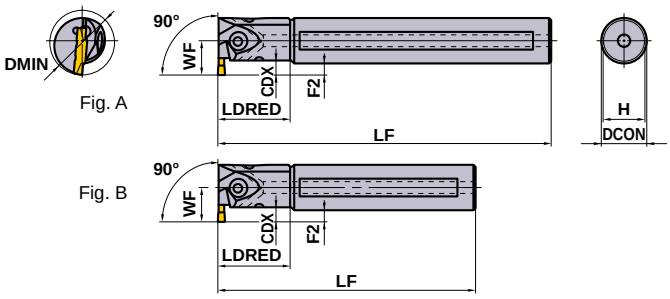


Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

●Mono block type (Air / coolant through)



Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm) ✶3	DMIN (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
D	2.00 2.24	6	25	Mono Block	R	GYAR20K90A-D06	●	—	—	B
					L	GYAL20K90A-D06	●	—	—	B
				Mono Block	R	GYAR20Q90A-D06	●	—	—	A
					L	GYAL20Q90A-D06	●	—	—	A
			32	Mono Block	R	GYAR25K90B-D06	●	—	—	B
					L	GYAL25K90B-D06	●	—	—	B
				Mono Block	R	GYAR25R90B-D06	●	—	—	A
					L	GYAL25R90B-D06	●	—	—	A
		4—9.5 ✶1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-D10	●	D
					L	GYDL32L90C-M20R	●	GYM20RA-D10	●	D
				Modular	R	GYDR32S90C-M20L	●	GYM20LA-D10	●	C
					L	GYDL32S90C-M20R	●	GYM20RA-D10	●	C
		5.5—9.5 ✶1	50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-D10	●	D
					L	GYDL40M90D-M20R	●	GYM20RA-D10	●	D
				Modular	R	GYDR40T90D-M20L	●	GYM20LA-D10	●	C
					L	GYDL40T90D-M20R	●	GYM20RA-D10	●	C
		7—11.5 ✶1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-D12	●	D
					L	GYDL40M90D-M25R	●	GYM25RA-D12	●	D
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-D12	●	C
					L	GYDL40T90D-M25R	●	GYM25RA-D12	●	C
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-D12	●	D
					L	GYDL50P90F-M25R	●	GYM25RA-D12	●	D
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-D12	●	C
					L	GYDL50T90F-M25R	●	GYM25RA-D12	●	C

✶1 The maximum groove depth varies according to the cutting diameter (**DMIN**). For details, please refer to page F224.
✶2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF, LDRED, WF** and **F2** values may vary.
✶3 The maximum groove depth (**CDX**) is a value within the dimension (**LDRED**).

● : Inventory maintained.

●Modular blade type (Air / coolant through)

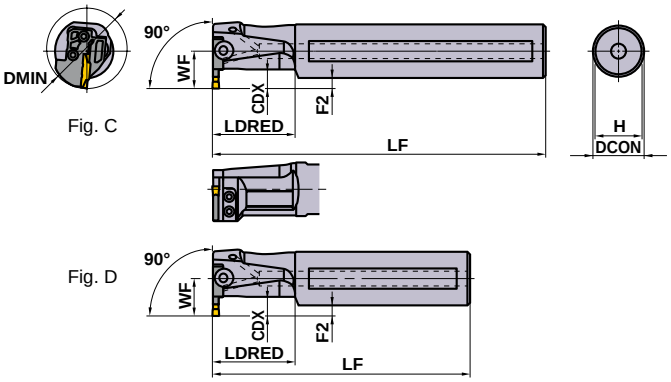


Fig. C

Fig. D

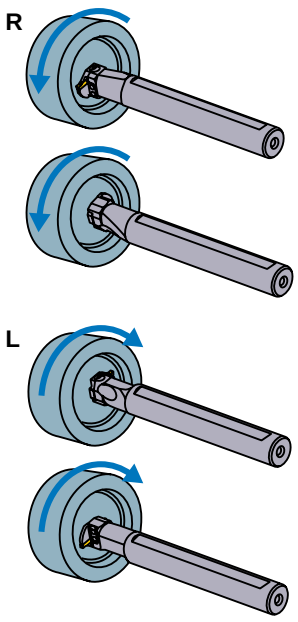
Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ∗
GYAR/L20○90A-○06	①GY05016S (Clamp Torque : 44 lbf-in)	–	①TKY20R
GYAR/L25○90B-○06			
GYDR/L32○90C-M20L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/L40○90D-M20L/R			
GYDR/L40○90D-M25L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYDR/L50○90F-M25L/R			

Dimensions (mm) ∗2						Cutting Mode
DCON	LF	LDRED	WF	F2	H	
20	125	30	14.5	4.5	18	R
20	125	30	14.5	4.5	18	
20	180	30	14.5	4.5	18	
20	180	30	14.5	4.5	18	
25	125	40	19.0	6.5	23	
25	125	40	19.0	6.5	23	
25	200	40	19.0	6.5	23	
25	200	40	19.0	6.5	23	
32	140	50	22.0	6.0	30	
32	140	50	22.0	6.0	30	
32	250	50	22.0	6.0	30	
32	250	50	22.0	6.0	30	
40	150	60	28.0	8.0	37	L
40	150	60	28.0	8.0	37	
40	300	60	28.0	8.0	37	
40	300	60	28.0	8.0	37	
40	150	60	28.0	8.0	37	
40	150	60	28.0	8.0	37	
40	300	60	28.0	8.0	37	
40	300	60	28.0	8.0	37	
50	170	80	34.0	9.0	47	
50	170	80	34.0	9.0	47	
50	300	80	34.0	9.0	47	
50	300	80	34.0	9.0	47	



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
D	.079", 2.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
D	.079", 2.00mm	●	●	●	●
	.088", 2.24mm	●			

● : Gauge insert shown dimensions

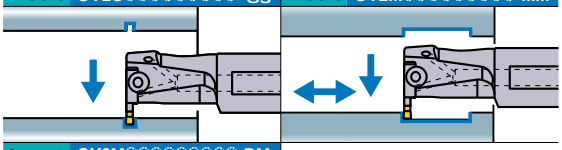
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F224
INSTRUCTION MANUAL ➤ F226

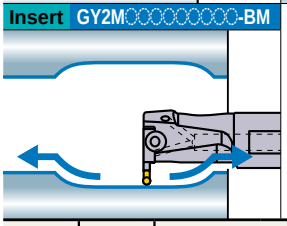
GY SERIES (INTERNAL GROOVING)

6-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM

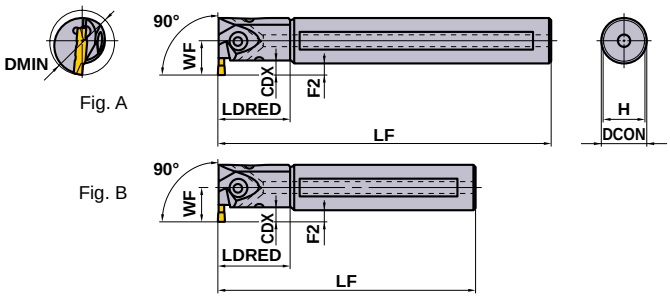


Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

●Mono block type (Air / coolant through)



Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm) ✶3	DMIN (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
E	2.39 2.50 2.74	6	25	Mono Block	R	GYAR20K90A-E06	●	—	—	B
					L	GYAL20K90A-E06	●	—	—	B
				Mono Block	R	GYAR20Q90A-E06	●	—	—	A
					L	GYAL20Q90A-E06	●	—	—	A
			32	Mono Block	R	GYAR25K90B-E06	●	—	—	B
					L	GYAL25K90B-E06	●	—	—	B
				Mono Block	R	GYAR25R90B-E06	●	—	—	A
					L	GYAL25R90B-E06	●	—	—	A
		4—9.5 ✶1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-E10	●	D
					L	GYDL32L90C-M20R	●	GYM20RA-E10	●	D
				Modular	R	GYDR32S90C-M20L	●	GYM20LA-E10	●	C
					L	GYDL32S90C-M20R	●	GYM20RA-E10	●	C
		5.5—9.5 ✶1	50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-E10	●	D
					L	GYDL40M90D-M20R	●	GYM20RA-E10	●	D
				Modular	R	GYDR40T90D-M20L	●	GYM20LA-E10	●	C
					L	GYDL40T90D-M20R	●	GYM20RA-E10	●	C
		7—11.5 ✶1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-E12	●	D
					L	GYDL40M90D-M25R	●	GYM25RA-E12	●	D
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-E12	●	C
					L	GYDL40T90D-M25R	●	GYM25RA-E12	●	C
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-E12	●	D
					L	GYDL50P90F-M25R	●	GYM25RA-E12	●	D
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-E12	●	C
					L	GYDL50T90F-M25R	●	GYM25RA-E12	●	C

✶1 The maximum groove depth varies according to the cutting diameter (**DMIN**). For details, please refer to page F224.
✶2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF, LDRED, WF** and **F2** values may vary.
✶3 The maximum groove depth (**CDX**) is a value within the dimension (**LDRED**).

● : Inventory maintained.

●Modular blade type (Air / coolant through)

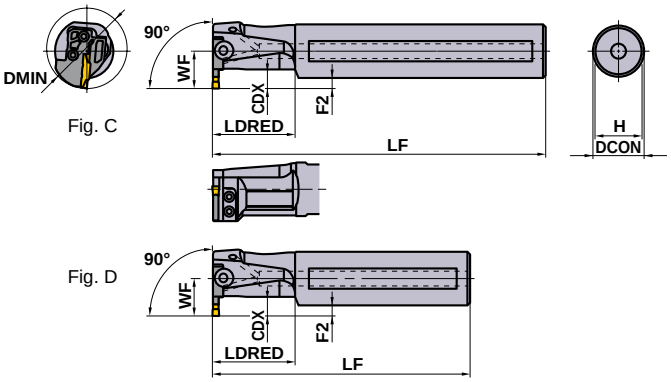


Fig. C

Fig. D

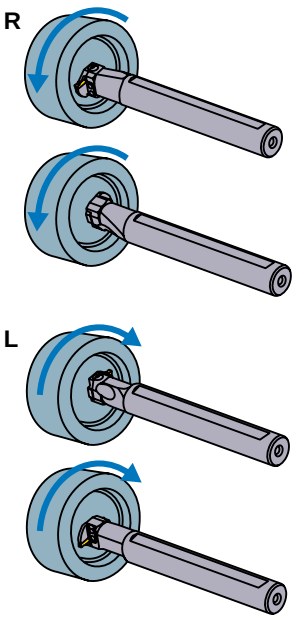
Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ∗
GYAR/L20○90A-○06 GYAR/L25○90B-○06	①GY05016S (Clamp Torque : 44 lbf-in)	–	①TKY20R
GYDR/L32○90C-M20L/R GYDR/L40○90D-M20L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/L40○90D-M25L/R GYDR/L50○90F-M25L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

	Dimensions (mm) ∗2						Cutting Mode
	DCON	LF	LDRED	WF	F2	H	
	20	125	30	14.5	4.5	18	R
	20	125	30	14.5	4.5	18	
	20	180	30	14.5	4.5	18	
	20	180	30	14.5	4.5	18	
	25	125	40	19.0	6.5	23	
	25	125	40	19.0	6.5	23	
	25	200	40	19.0	6.5	23	
	25	200	40	19.0	6.5	23	
	32	140	50	22.0	6.0	30	
	32	140	50	22.0	6.0	30	
	32	250	50	22.0	6.0	30	
	32	250	50	22.0	6.0	30	
	40	150	60	28.0	8.0	37	L
	40	150	60	28.0	8.0	37	
	40	300	60	28.0	8.0	37	
	40	300	60	28.0	8.0	37	
	40	150	60	28.0	8.0	37	
	40	150	60	28.0	8.0	37	
	40	300	60	28.0	8.0	37	
	40	300	60	28.0	8.0	37	
	50	170	80	34.0	9.0	47	
	50	170	80	34.0	9.0	47	
	50	300	80	34.0	9.0	47	
	50	300	80	34.0	9.0	47	



Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
E	.094", 2.39mm	●	●	●	●
	.098", 2.50mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
E	.094", 2.39mm	●			
	.098", 2.50mm	●	●	●	●
	.108", 2.74mm	●			

● : Gauge insert shown dimensions

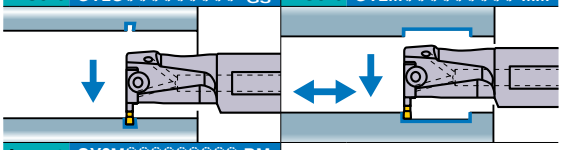
GROOVING

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F224
INSTRUCTION MANUAL ➤ F226

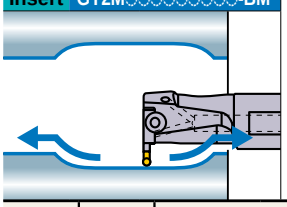
GY SERIES (INTERNAL GROOVING)

6-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM

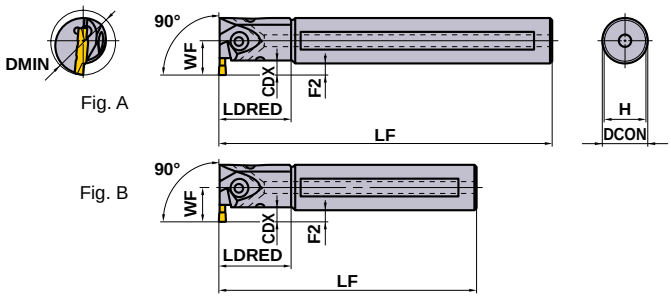


Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

●Mono block type (Air / coolant through)



Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm) ✶3	DMIN (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	6	25	Mono Block	R	GYAR20K90A-F06	●	—	—	B
					L	GYAL20K90A-F06	●	—	—	B
				Mono Block	R	GYAR20Q90A-F06	●	—	—	A
					L	GYAL20Q90A-F06	●	—	—	A
			32	Mono Block	R	GYAR25K90B-F06	●	—	—	B
					L	GYAL25K90B-F06	●	—	—	B
				Mono Block	R	GYAR25R90B-F06	●	—	—	A
					L	GYAL25R90B-F06	●	—	—	A
		4—9.5 ✶1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-F10	●	D
					L	GYDL32L90C-M20R	●	GYM20RA-F10	●	D
				Modular	R	GYDR32S90C-M20L	●	GYM20LA-F10	●	C
					L	GYDL32S90C-M20R	●	GYM20RA-F10	●	C
		5.5—9.5 ✶1	50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-F10	●	D
					L	GYDL40M90D-M20R	●	GYM20RA-F10	●	D
				Modular	R	GYDR40T90D-M20L	●	GYM20LA-F10	●	C
					L	GYDL40T90D-M20R	●	GYM20RA-F10	●	C
		7—11.5 ✶1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-F12	●	D
					L	GYDL40M90D-M25R	●	GYM25RA-F12	●	D
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-F12	●	C
					L	GYDL40T90D-M25R	●	GYM25RA-F12	●	C
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-F12	●	D
					L	GYDL50P90F-M25R	●	GYM25RA-F12	●	D
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-F12	●	C
					L	GYDL50T90F-M25R	●	GYM25RA-F12	●	C
G	4.00 4.24	7	32	Mono Block	R	GYAR25K90B-G07	●	—	—	B
					L	GYAL25K90B-G07	●	—	—	B
				Mono Block	R	GYAR25R90B-G07	●	—	—	A
					L	GYAL25R90B-G07	●	—	—	A
		4.5—11.5 ✶1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-G12	●	D
					L	GYDL32L90C-M20R	●	GYM20RA-G12	●	D
				Modular	R	GYDR32S90C-M20L	●	GYM20LA-G12	●	C
					L	GYDL32S90C-M20R	●	GYM20RA-G12	●	C
		6—11.5 ✶1	50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-G12	●	D
					L	GYDL40M90D-M20R	●	GYM20RA-G12	●	D
				Modular	R	GYDR40T90D-M20L	●	GYM20LA-G12	●	C
					L	GYDL40T90D-M20R	●	GYM20RA-G12	●	C
		7.5—13 ✶1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-G14	●	D
					L	GYDL40M90D-M25R	●	GYM25RA-G14	●	D
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-G14	●	C
					L	GYDL40T90D-M25R	●	GYM25RA-G14	●	C
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-G14	●	D
					L	GYDL50P90F-M25R	●	GYM25RA-G14	●	D
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-G14	●	C
					L	GYDL50T90F-M25R	●	GYM25RA-G14	●	C

✶1 The maximum groove depth varies according to the cutting diameter (**DMIN**). For details, please refer to page F224.
✶2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF, LDRED, WF** and **F2** values may vary.
✶3 The maximum groove depth (**CDX**) is a value within the dimension (**LDRED**).

● : Inventory maintained.

●Modular blade type (Air / coolant through)

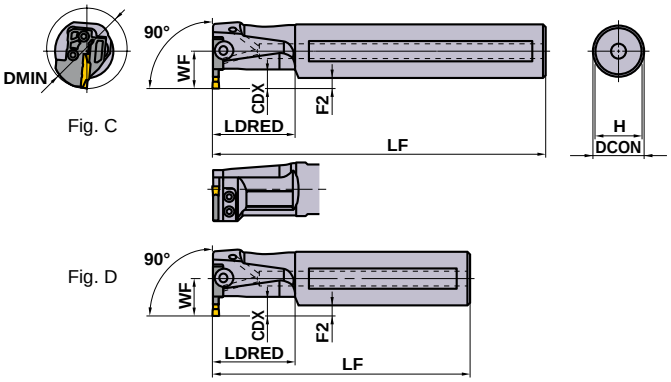


Fig. C

Fig. D

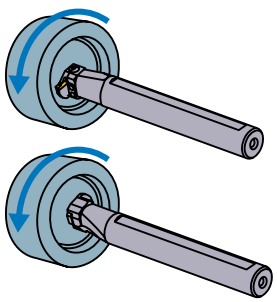
Right hand tool holder shown.

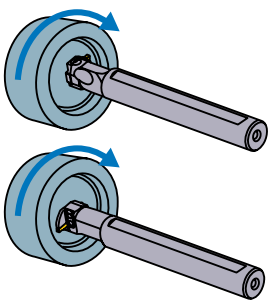
＊Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	① 4 pcs. Blade Screw	① ② Wrench ＊
GYAR/L20○90A-F06 GYAR/L25○90B-○○○	①GY05016S (Clamp Torque : 44 lbf-in)	–	①TKY20R
GYDR/L32○90C-M20L/R GYDR/L40○90D-M20L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/L40○90D-M25L/R GYDR/L50○90F-M25L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Cutting Mode	Dimensions (mm) ＊2					
	DCON	LF	LDRED	WF	F2	H
R	20	125	30	14.5	4.5	18
	20	125	30	14.5	4.5	18
	20	180	30	14.5	4.5	18
	20	180	30	14.5	4.5	18
	25	125	40	19.0	6.5	23
	25	125	40	19.0	6.5	23
	25	200	40	19.0	6.5	23
	25	200	40	19.0	6.5	23
	32	140	50	22.0	6.0	30
	32	140	50	22.0	6.0	30
	32	250	50	22.0	6.0	30
	32	250	50	22.0	6.0	30
	40	150	60	28.0	8.0	37
	40	150	60	28.0	8.0	37
	40	300	60	28.0	8.0	37
	40	300	60	28.0	8.0	37
	40	150	60	28.0	8.0	37
	40	150	60	28.0	8.0	37
	40	300	60	28.0	8.0	37
	40	300	60	28.0	8.0	37
	50	170	80	34.0	9.0	47
	50	170	80	34.0	9.0	47
	50	300	80	34.0	9.0	47
	50	300	80	34.0	9.0	47
L	25	125	40	19.0	6.5	23
	25	125	40	19.0	6.5	23
	25	200	40	19.0	6.5	23
	25	200	40	19.0	6.5	23
	32	140	50	22.0	6.0	30
	32	140	50	22.0	6.0	30
	32	250	50	22.0	6.0	30
	32	250	50	22.0	6.0	30
	40	150	60	28.0	8.0	37
	40	150	60	28.0	8.0	37
	40	300	60	28.0	8.0	37
	40	300	60	28.0	8.0	37
	40	150	60	28.0	8.0	37
	40	150	60	28.0	8.0	37
	40	300	60	28.0	8.0	37
	40	300	60	28.0	8.0	37
	50	170	80	34.0	9.0	47
	50	170	80	34.0	9.0	47
	50	300	80	34.0	9.0	47
	50	300	80	34.0	9.0	47





Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
F	.118", 3.00mm	●	●	●	●
	.125", 3.18mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
F	.118", 3.00mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm			●	
	.125", 3.18mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	.128", 3.24mm	●			

Seat Size	Insert Number
G	GY○○0400/0424G○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	GFGS
G	.157", 4.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
G	.157", 4.00mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm	●		●	
	.167", 4.24mm	●			

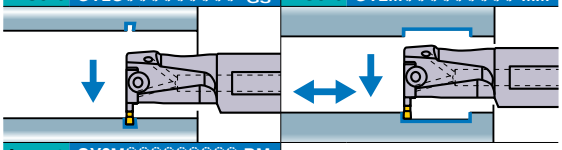
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F224
INSTRUCTION MANUAL ➤ F226

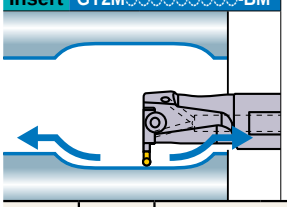
GY SERIES (INTERNAL GROOVING)

6-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM

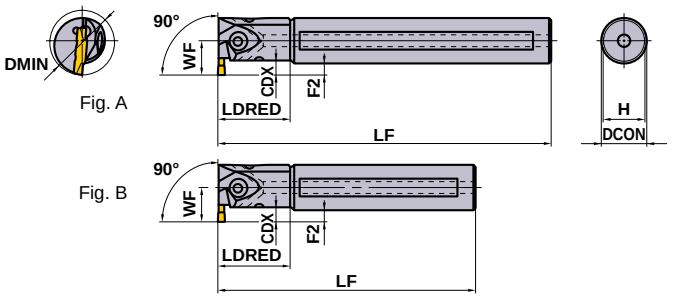


Insert GY2M○○○○○○○○○-BM



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

●Mono block type (Air / coolant through)



Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm) *3	DMIN (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	7	32	Mono Block	R	GYAR25K90B-H07	●	—	—	B
					L	GYAL25K90B-H07	●	—	—	B
				Mono Block	R	GYAR25R90B-H07	●	—	—	A
					L	GYAL25R90B-H07	●	—	—	A
		4.5—11.5 *1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-H12	●	D
					L	GYDL32L90C-M20R	●	GYM20RA-H12	●	D
				Modular	R	GYDR32S90C-M20L	●	GYM20LA-H12	●	C
					L	GYDL32S90C-M20R	●	GYM20RA-H12	●	C
		6—11.5 *1	50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-H12	●	D
					L	GYDL40M90D-M20R	●	GYM20RA-H12	●	D
				Modular	R	GYDR40T90D-M20L	●	GYM20LA-H12	●	C
					L	GYDL40T90D-M20R	●	GYM20RA-H12	●	C
		7.5—13 *1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-H14	●	D
					L	GYDL40M90D-M25R	●	GYM25RA-H14	●	D
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-H14	●	C
					L	GYDL40T90D-M25R	●	GYM25RA-H14	●	C
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-H14	●	D
					L	GYDL50P90F-M25R	●	GYM25RA-H14	●	D
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-H14	●	C
					L	GYDL50T90F-M25R	●	GYM25RA-H14	●	C
J	6.00 6.31 6.35	7.5—13 *1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-J14	●	D
					L	GYDL40M90D-M25R	●	GYM25RA-J14	●	D
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-J14	●	C
					L	GYDL40T90D-M25R	●	GYM25RA-J14	●	C
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-J14	●	D
					L	GYDL50P90F-M25R	●	GYM25RA-J14	●	D
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-J14	●	C
					L	GYDL50T90F-M25R	●	GYM25RA-J14	●	C

*1 The maximum groove depth varies according to the cutting diameter (**DMIN**). For details, please refer to page F224.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF, LDRED, WF** and **F2** values may vary.
*3 The maximum groove depth (**CDX**) is a value within the dimension (**LDRED**).

● : Inventory maintained.

●Modular blade type (Air / coolant through)

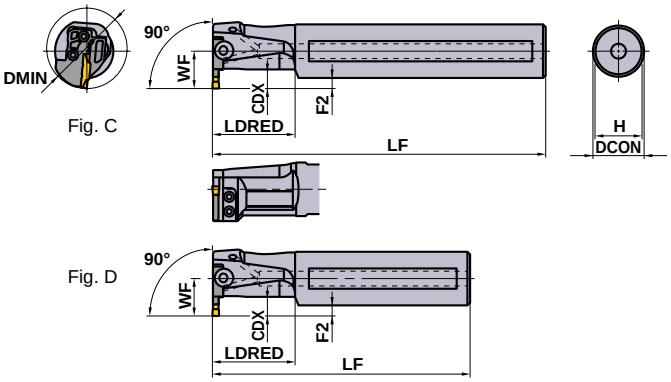


Fig. C

Fig. D

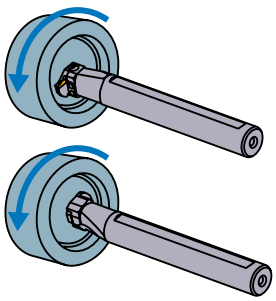
Right hand tool holder shown.

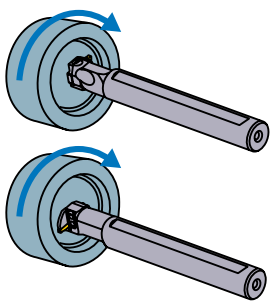
＊Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ＊
GYAR/L25○90B-○07	①GY05016S (Clamp Torque : 44 lbf-in)	–	①TKY20R
GYDR/L32○90C-M20L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/L40○90D-M20L/R			
GYDR/L40○90D-M25L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYDR/L50○90F-M25L/R			

Dimensions (mm) ＊2						Cutting Mode
DCON	LF	LDRED	WF	F2	H	
25	125	40	19	6.5	23	R
25	125	40	19	6.5	23	
25	200	40	19	6.5	23	
25	200	40	19	6.5	23	
32	140	50	22	6.0	30	
32	140	50	22	6.0	30	
32	250	50	22	6.0	30	
32	250	50	22	6.0	30	
40	150	60	28	8.0	37	
40	150	60	28	8.0	37	
40	300	60	28	8.0	37	
40	300	60	28	8.0	37	
40	150	60	28	8.0	37	
40	150	60	28	8.0	37	
40	300	60	28	8.0	37	
40	300	60	28	8.0	37	
50	170	80	34	9.0	47	
50	170	80	34	9.0	47	
50	300	80	34	9.0	47	
50	300	80	34	9.0	47	
40	150	60	28	8.0	37	L
40	150	60	28	8.0	37	
40	300	60	28	8.0	37	
40	300	60	28	8.0	37	
50	170	80	34	9.0	47	
50	170	80	34	9.0	47	
50	300	80	34	9.0	47	
50	300	80	34	9.0	47	





Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
H	.187", 4.75mm	●	●	●	●
	.197", 5.00mm	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
H	.187", 4.75mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	RE 0.8mm	●			
	.197", 5.00mm				●
	RE 0.2mm	●			
	RE 0.4mm	●	●	●	
	RE 0.8mm	●	●	●	
	.206", 5.24mm	●			

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	GFGS
J	.236", 6.00mm	●	●	●	
	.250", 6.35mm	●	●	●	

For Multifunctional Grooving ➤ F014, F015

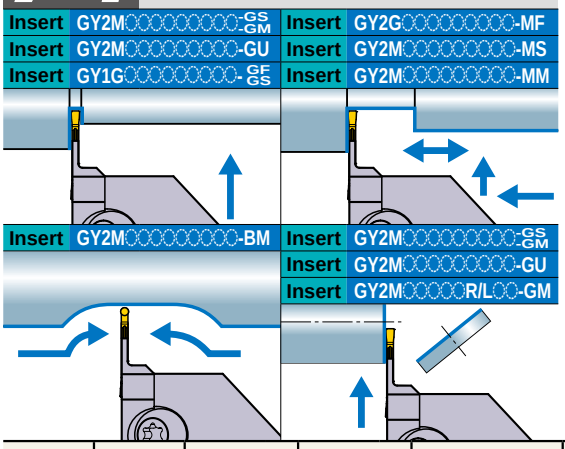
Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
J	.236", 6.00mm				●
	RE 0.2mm	●			
	RE 0.4mm	●	●	●	
	RE 0.8mm	●	●	●	
	.248", 6.31mm	●			
	.250", 6.35mm				●
	RE 0.2mm	●			
	RE 0.4mm	●			
	RE 0.8mm	●			

● : Gauge insert shown dimensions

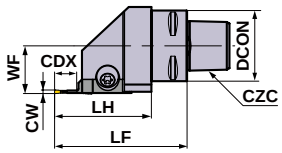
IDENTIFICATION ➤ F010, F011
CUTTING CONDITIONS ➤ F224
INSTRUCTION MANUAL ➤ F226

GY SERIES (EXTERNAL GROOVING PSC TYPE)

7-1 00° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



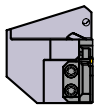


Fig. A

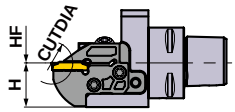
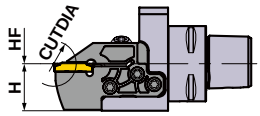


Fig. B



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.	CZC
D	.079 .088	.236	.472	Modular	R	C3-GYHRDX00-M20R	○	GYM20RA-D06	●	A	C3
					L	C3-GYHLDX00-M20L	○	GYM20LA-D06	●	A	
				Modular	R	C4-GYHREX00-M25R	○	GYM25RA-D06	●	A	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-D06	●	A	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-D06	●	A	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-D06	●	A	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-D06	●	A	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-D06	●	A	
		.394	.787	Modular	R	C3-GYHRDX00-M20R	○	GYM20RA-D10	●	A	C3
					L	C3-GYHLDX00-M20L	○	GYM20LA-D10	●	A	
		.472	.945	Modular	R	C4-GYHREX00-M25R	○	GYM25RA-D12	●	A	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-D12	●	A	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-D12	●	A	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-D12	●	A	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-D12	●	A	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-D12	●	A	
		.709*4	1.417	Modular	R	C3-GYHRDX00-M20R	○	GYM20RB-D18	●	B	C3
					L	C3-GYHLDX00-M20L	○	GYM20LB-D18	●	B	
		.787*1	1.575*2	Modular	R	C4-GYHREX00-M25R	○	GYM25RA-D20	●	B	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-D20	●	B	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-D20	●	B	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-D20	●	B	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-D20	●	B	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-D20	●	B	

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

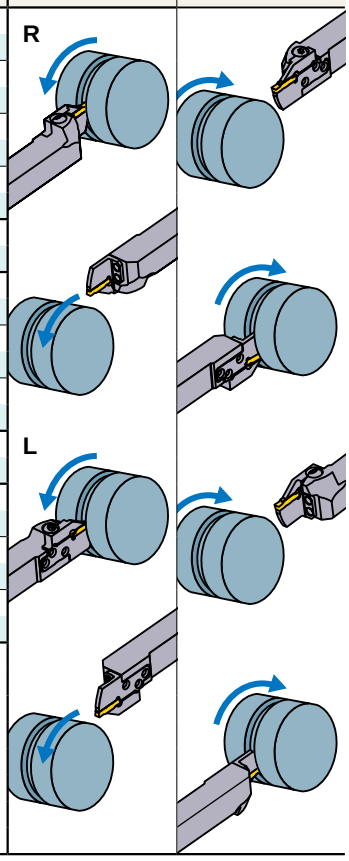
● : Inventory maintained. ○ : Inventory maintained.(Available from Summer 2015)

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench *
C3-GYHR/LDX00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LEX00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LEX00-M25R/L			
C6-GYHR/LF00-M25R/L			

Dimensions (inch) *3						Cutting Mode	
DCON	**LF**	**LH**	**WF**	**HF**	**H**	Clockwise	Anticlockwise
1.260	2.323	1.724	.866	0	.787	R	
1.260	2.323	1.724	.866	0	.787		
1.575	2.638	1.843	1.063	0	.984		
1.575	2.638	1.843	1.063	0	.984		
1.969	2.638	1.843	1.378	0	1.063		
1.969	2.638	1.843	1.378	0	1.063		
2.480	2.835	1.961	1.772	0	1.378		
2.480	2.835	1.961	1.772	0	1.378		
1.260	2.559	1.961	.866	0	.787		
1.260	2.559	1.961	.866	0	.787		
1.575	2.953	2.157	1.063	0	.984		
1.575	2.953	2.157	1.063	0	.984		
1.969	2.953	2.157	1.378	0	1.063		
1.969	2.953	2.157	1.378	0	1.063		
2.480	3.150	2.276	1.772	0	1.378		
2.480	3.150	2.276	1.772	0	1.378		
1.260	2.795	2.197	.866	0	.787	L	
1.260	2.795	2.197	.866	0	.787		
1.575	3.189	2.394	1.063	0	.984		
1.575	3.189	2.394	1.063	0	.984		
1.969	3.189	2.394	1.378	0	1.063		
1.969	3.189	2.394	1.378	0	1.063		
2.480	3.386	2.512	1.772	0	1.378		
2.480	3.386	2.512	1.772	0	1.378		



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
D	.079", 2.00mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

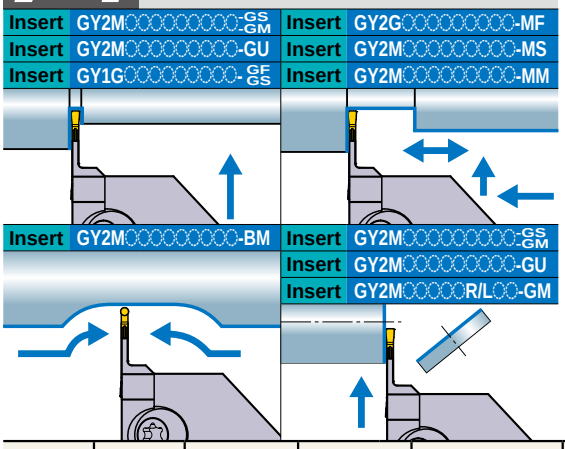
Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
D	.079", 2.00mm	●	●	●	●
	.088", 2.24mm	●			

● : Gauge insert shown dimensions

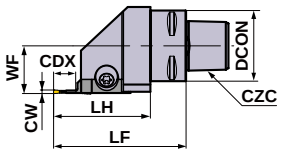
IDENTIFICATION ➤ F012
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING PSC TYPE)

7-1 00° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



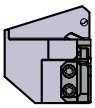


Fig. A

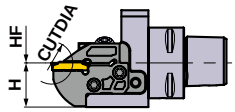
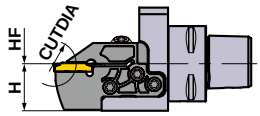


Fig. B



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.	CZC
E	.094 .098 .108	.236	.472	Modular	R	C3-GYHRDX00-M20R	○	GYM20RA-E06	●	A	C3
					L	C3-GYHLDX00-M20L	○	GYM20LA-E06	●	A	
				Modular	R	C4-GYHREX00-M25R	○	GYM25RA-E06	●	A	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-E06	●	A	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-E06	●	A	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-E06	●	A	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-E06	●	A	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-E06	●	A	
		.394	.787	Modular	R	C3-GYHRDX00-M20R	○	GYM20RA-E10	●	A	C3
					L	C3-GYHLDX00-M20L	○	GYM20LA-E10	●	A	
		.472	.945	Modular	R	C4-GYHREX00-M25R	○	GYM25RA-E12	●	A	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-E12	●	A	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-E12	●	A	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-E12	●	A	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-E12	●	A	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-E12	●	A	
		.709*4	1.417	Modular	R	C3-GYHRDX00-M20R	○	GYM20RB-E18	●	B	C3
					L	C3-GYHLDX00-M20L	○	GYM20LB-E18	●	B	
		.787*1	1.575*2	Modular	R	C4-GYHREX00-M25R	○	GYM25RA-E20	●	B	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-E20	●	B	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-E20	●	B	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-E20	●	B	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-E20	●	B	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-E20	●	B	

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

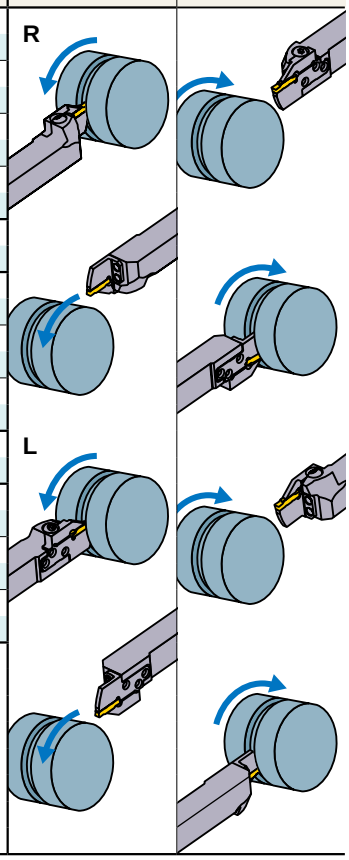
● : Inventory maintained. ○ : Inventory maintained.(Available from Summer 2015)

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench *
C3-GYHR/LDX00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LEX00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LEX00-M25R/L			
C6-GYHR/LF00-M25R/L			

	Dimensions (inch) *3						Cutting Mode	
	DCON	**LF**	**LH**	**WF**	**HF**	**H**	Clockwise	Anticlockwise
	1.260	2.323	1.724	.866	0	.787	R	
	1.260	2.323	1.724	.866	0	.787		
	1.575	2.638	1.843	1.063	0	.984		
	1.575	2.638	1.843	1.063	0	.984		
	1.969	2.638	1.843	1.378	0	1.063		
	1.969	2.638	1.843	1.378	0	1.063		
	2.480	2.835	1.961	1.772	0	1.378		
	2.480	2.835	1.961	1.772	0	1.378		
	1.260	2.559	1.961	.866	0	.787		
	1.260	2.559	1.961	.866	0	.787		
	1.575	2.953	2.157	1.063	0	.984		
	1.575	2.953	2.157	1.063	0	.984		
	1.969	2.953	2.157	1.378	0	1.063		
	1.969	2.953	2.157	1.378	0	1.063		
	2.480	3.150	2.276	1.772	0	1.378		
	2.480	3.150	2.276	1.772	0	1.378		
	1.260	2.795	2.197	.866	0	.787	L	
	1.260	2.795	2.197	.866	0	.787		
	1.575	3.189	2.394	1.063	0	.984		
	1.575	3.189	2.394	1.063	0	.984		
	1.969	3.189	2.394	1.378	0	1.063		
	1.969	3.189	2.394	1.378	0	1.063		
	2.480	3.386	2.512	1.772	0	1.378		
	2.480	3.386	2.512	1.772	0	1.378		



Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
E	.094", 2.39mm	●	●	●		●
	.098", 2.50mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

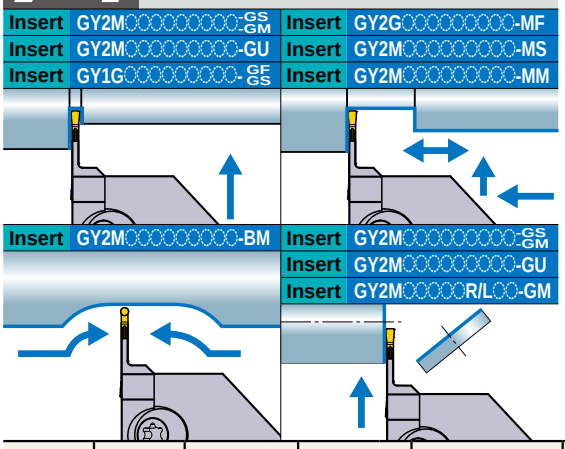
Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
E	.094", 2.39mm	●			
	.098", 2.50mm	●	●	●	●
	.108", 2.74mm	●			

● : Gauge insert shown dimensions

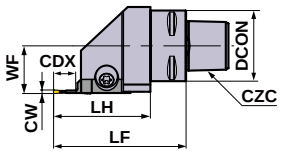
IDENTIFICATION ➤ F012
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING PSC TYPE)

7-1 00° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



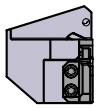


Fig. A

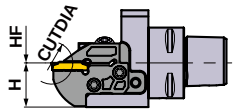
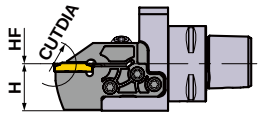


Fig. B



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.	CZC
F	.118 .125 .128	.236	.472	Modular	R	C3-GYHRDX00-M20R	○	GYM20RA-F06	●	A	C3
					L	C3-GYHLDX00-M20L	○	GYM20LA-F06	●	A	
				Modular	R	C4-GYHREX00-M25R	○	GYM25RA-F06	●	A	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-F06	●	A	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-F06	●	A	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-F06	●	A	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-F06	●	A	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-F06	●	A	
		.394	.787	Modular	R	C3-GYHRDX00-M20R	○	GYM20RA-F10	●	A	C3
					L	C3-GYHLDX00-M20L	○	GYM20LA-F10	●	A	
		.472	.945	Modular	R	C4-GYHREX00-M25R	○	GYM25RA-F12	●	A	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-F12	●	A	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-F12	●	A	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-F12	●	A	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-F12	●	A	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-F12	●	A	
		.709*4	1.417	Modular	R	C3-GYHRDX00-M20R	○	GYM20RB-F18	●	B	C3
					L	C3-GYHLDX00-M20L	○	GYM20LB-F18	●	B	
		.787*1	1.575*2	Modular	R	C4-GYHREX00-M25R	○	GYM25RA-F20	●	B	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-F20	●	B	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-F20	●	B	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-F20	●	B	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-F20	●	B	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-F20	●	B	

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

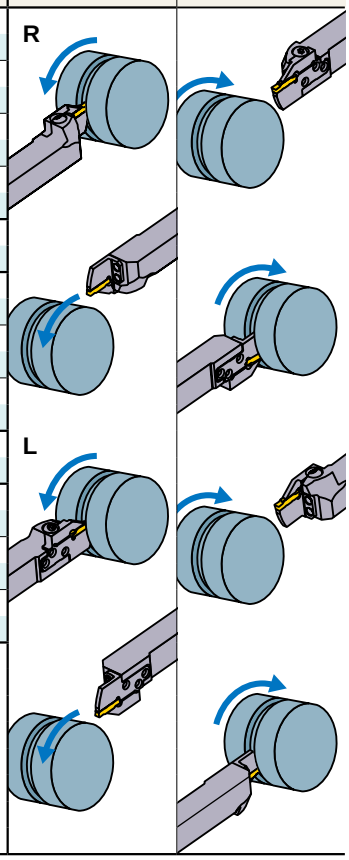
● : Inventory maintained. ○ : Inventory maintained.(Available from Summer 2015)

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench *
C3-GYHR/LDX00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LEX00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LEX00-M25R/L			
C6-GYHR/LF00-M25R/L			

Dimensions (inch) *3						Cutting Mode	
DCON	**LF**	**LH**	**WF**	**HF**	**H**	Clockwise	Anticlockwise
1.260	2.323	1.724	.866	0	.787	R	
1.260	2.323	1.724	.866	0	.787		
1.575	2.638	1.843	1.063	0	.984		
1.575	2.638	1.843	1.063	0	.984		
1.969	2.638	1.843	1.378	0	1.063		
1.969	2.638	1.843	1.378	0	1.063		
2.480	2.835	1.961	1.772	0	1.378		
2.480	2.835	1.961	1.772	0	1.378		
1.260	2.559	1.961	.866	0	.787		
1.260	2.559	1.961	.866	0	.787		
1.575	2.953	2.157	1.063	0	.984		
1.575	2.953	2.157	1.063	0	.984		
1.969	2.953	2.157	1.378	0	1.063		
1.969	2.953	2.157	1.378	0	1.063		
2.480	3.150	2.276	1.772	0	1.378		
2.480	3.150	2.276	1.772	0	1.378		
1.260	2.795	2.197	.866	0	.787	L	
1.260	2.795	2.197	.866	0	.787		
1.575	3.189	2.394	1.063	0	.984		
1.575	3.189	2.394	1.063	0	.984		
1.969	3.189	2.394	1.378	0	1.063		
1.969	3.189	2.394	1.378	0	1.063		
2.480	3.386	2.512	1.772	0	1.378		
2.480	3.386	2.512	1.772	0	1.378		



Select an Insert

Seat Size	Insert Number
F	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU Neutral	GS Neutral	GM Neutral	05-GM Hand	GFGS Neutral
F	.118", 3.00mm	●	●	●	●	●
	.125", 3.18mm	●	●	●		●

For Multifunctional Grooving ➤ F014, F015

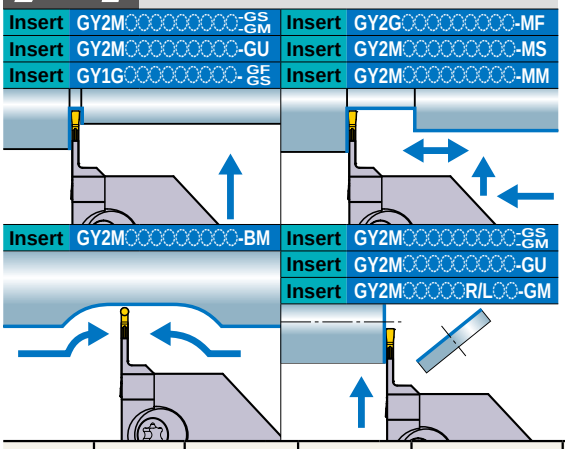
Seat Size	Breaker / CW	MF	MS	MM	BM Ball nose
F	.118", 3.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24mm	●			

● : Gauge insert shown dimensions

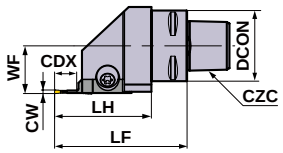
IDENTIFICATION ➤ F012
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING PSC TYPE)

7-1 00° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



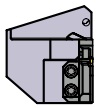


Fig. A

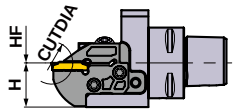
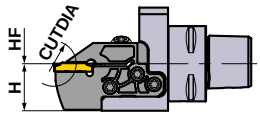


Fig. B



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.	CZC
G	.157 .167	.315	.630	Modular	R	C4-GYHREX00-M25R	○	GYM25RA-G08	●	A	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-G08	●	A	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-G08	●	A	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-G08	●	A	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-G08	●	A	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-G08	●	A	
		.472	.945	Modular	R	C3-GYHRDX00-M20R	○	GYM20RA-G12	●	A	C3
					L	C3-GYHLDX00-M20L	○	GYM20LA-G12	●	A	
		.551	1.102	Modular	R	C4-GYHREX00-M25R	○	GYM25RA-G14	●	A	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-G14	●	A	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-G14	●	A	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-G14	●	A	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-G14	●	A	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-G14	●	A	
		.984*1	1.969*2	Modular	R	C4-GYHREX00-M25R	○	GYM25RA-G25	●	B	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-G25	●	B	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-G25	●	B	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-G25	●	B	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-G25	●	B	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-G25	●	B	

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

● : Inventory maintained. ○ : Inventory maintained.(Available from Summer 2015)

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench *
C3-GYHR/LDX00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LEX00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LEX00-M25R/L			
C6-GYHR/LF00-M25R/L			

	Dimensions (inch) *3						Cutting Mode	
	DCON	**LF**	**LH**	**WF**	**HF**	**H**	Clockwise	Anticlockwise
	1.575	2.717	1.921	1.063	0	.984	R	
	1.575	2.717	1.921	1.063	0	.984		
	1.969	2.717	1.921	1.378	0	1.063		
	1.969	2.717	1.921	1.378	0	1.063		
	2.480	2.913	2.039	1.772	0	1.378		
	2.480	2.913	2.039	1.772	0	1.378		
	1.260	2.559	1.961	.866	0	.787		
	1.260	2.559	1.961	.866	0	.787		
	1.575	2.953	2.157	1.063	0	.984		
	1.575	2.953	2.157	1.063	0	.984		
	1.969	2.953	2.157	1.378	0	1.063		
	1.969	2.953	2.157	1.378	0	1.063		
	2.480	3.150	2.276	1.772	0	1.378		
	2.480	3.150	2.276	1.772	0	1.378		
	1.575	3.386	2.591	1.063	0	.984	L	
	1.575	3.386	2.591	1.063	0	.984		
	1.969	3.386	2.591	1.378	0	1.063		
	1.969	3.386	2.591	1.378	0	1.063		
	2.480	3.583	2.709	1.772	0	1.378		
	2.480	3.583	2.709	1.772	0	1.378		

Select an Insert

Seat Size	Insert Number
G	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
G	.157", 4.00mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

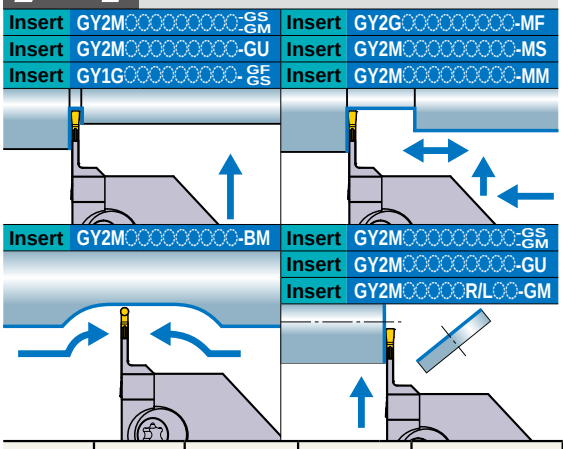
Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
G	.157", 4.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24mm	●			

● : Gauge insert shown dimensions

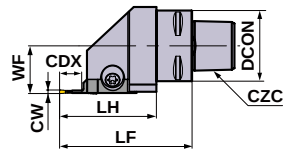
IDENTIFICATION ➤ F012
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING PSC TYPE)

7-1 00° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



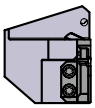


Fig. A

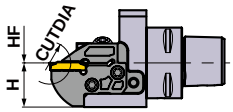
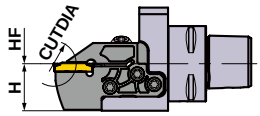


Fig. B



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.	CZC
H	.187 .197 .206	.315	.630	Modular	R	C4-GYHREX00-M25R	○	GYM25RA-H08	●	A	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-H08	●	A	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-H08	●	A	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-H08	●	A	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-H08	●	A	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-H08	●	A	
		.472	.945	Modular	R	C3-GYHRDX00-M20R	○	GYM20RA-H12	●	A	C3
					L	C3-GYHLDX00-M20L	○	GYM20LA-H12	●	A	
		.551	1.102	Modular	R	C4-GYHREX00-M25R	○	GYM25RA-H14	●	A	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-H14	●	A	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-H14	●	A	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-H14	●	A	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-H14	●	A	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-H14	●	A	
		.984*1	1.969*2	Modular	R	C4-GYHREX00-M25R	○	GYM25RA-H25	●	B	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-H25	●	B	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-H25	●	B	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-H25	●	B	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-H25	●	B	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-H25	●	B	
J	.236 .248 .250	.315	.630	Modular	R	C4-GYHREX00-M25R	○	GYM25RA-J08	●	A	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-J08	●	A	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-J08	●	A	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-J08	●	A	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-J08	●	A	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-J08	●	A	
		.551	1.102	Modular	R	C4-GYHREX00-M25R	○	GYM25RA-J14	●	A	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-J14	●	A	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-J14	●	A	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-J14	●	A	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-J14	●	A	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-J14	●	A	
		.984*1	1.969*2	Modular	R	C4-GYHREX00-M25R	○	GYM25RA-J25	●	B	C4
					L	C4-GYHLEX00-M25L	○	GYM25LA-J25	●	B	
				Modular	R	C5-GYHREX00-M25R	○	GYM25RA-J25	●	B	C5
					L	C5-GYHLEX00-M25L	○	GYM25LA-J25	●	B	
				Modular	R	C6-GYHRF00-M25R	○	GYM25RA-J25	●	B	C6
					L	C6-GYHLF00-M25L	○	GYM25LA-J25	●	B	

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

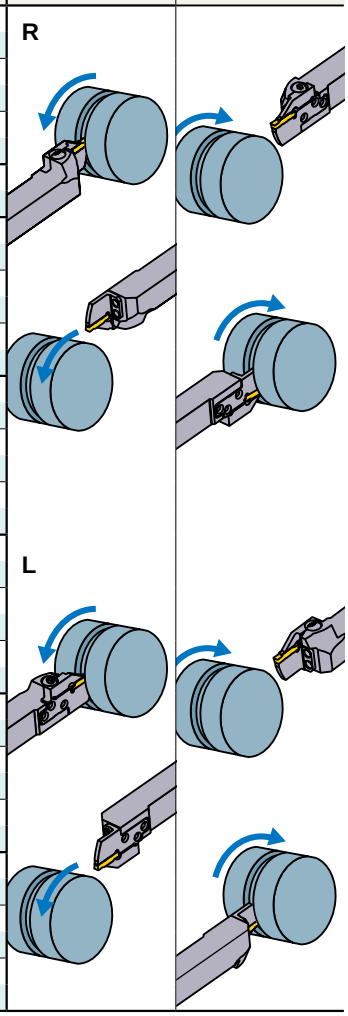
● : Inventory maintained. ○ : Inventory maintained.(Available from Summer 2015)

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench *
C3-GYHR/LDX00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LEX00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LEX00-M25R/L			
C6-GYHR/LF00-M25R/L			

Dimensions (inch) *3						Cutting Mode	
DCON	LF	LH	WF	HF	H	Clockwise	Anticlockwise
1.575	2.717	1.921	1.063	0	.984	R	
1.575	2.717	1.921	1.063	0	.984		
1.969	2.717	1.921	1.378	0	1.063		
1.969	2.717	1.921	1.378	0	1.063		
2.480	2.913	2.039	1.772	0	1.378		
2.480	2.913	2.039	1.772	0	1.378		
1.260	2.559	1.961	.866	0	.787		
1.260	2.559	1.961	.866	0	.787		
1.575	2.953	2.157	1.063	0	.984		
1.575	2.953	2.157	1.063	0	.984		
1.969	2.953	2.157	1.378	0	1.063		
1.969	2.953	2.157	1.378	0	1.063		
2.480	3.150	2.276	1.772	0	1.378		
2.480	3.150	2.276	1.772	0	1.378		
1.575	3.386	2.591	1.063	0	.984		
1.575	3.386	2.591	1.063	0	.984		
1.969	3.386	2.591	1.378	0	1.063		
1.969	3.386	2.591	1.378	0	1.063		
2.480	3.583	2.709	1.772	0	1.378		
2.480	3.583	2.709	1.772	0	1.378		
1.575	2.717	1.921	1.063	0	.984	L	
1.575	2.717	1.921	1.063	0	.984		
1.969	2.717	1.921	1.378	0	1.063		
1.969	2.717	1.921	1.378	0	1.063		
2.480	2.913	2.039	1.772	0	1.378		
2.480	2.913	2.039	1.772	0	1.378		
1.575	2.953	2.157	1.063	0	.984		
1.575	2.953	2.157	1.063	0	.984		
1.969	2.953	2.157	1.378	0	1.063		
1.969	2.953	2.157	1.378	0	1.063		
2.480	3.150	2.276	1.772	0	1.378		
2.480	3.150	2.276	1.772	0	1.378		
1.575	3.386	2.591	1.063	0	.984		
1.575	3.386	2.591	1.063	0	.984		
1.969	3.386	2.591	1.378	0	1.063		
1.969	3.386	2.591	1.378	0	1.063		
2.480	3.583	2.709	1.772	0	1.378		
2.480	3.583	2.709	1.772	0	1.378		



Select an Insert

Seat Size	Insert Number
H	**GY○○0475/0500/0524H○○○○−Breaker**
J	**GY○○0600/0631/0635J○○○○−Breaker**

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU Neutral	GS Neutral	GM Neutral	05-GM Hand	GFGS Neutral
H	.187", 4.75mm	●	●	●		●
	.197", 5.00mm	●	●	●	●	●
J	.236", 6.00mm	●	●	●		
	.250", 6.35mm	●	●	●		

For Multifunctional Grooving ➤ F014, F015

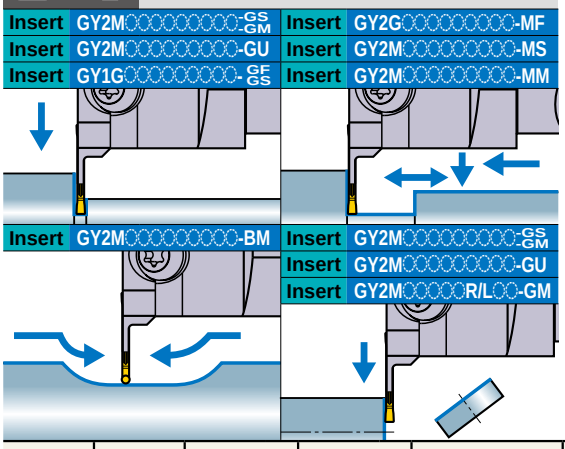
Seat Size	Breaker / CW	MF	MS	MM	BM Ball nose
H	.187", 4.75mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24mm	●			
J	.236", 6.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.248", 6.31mm	●			
	.250", 6.35mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			

● : Gauge insert shown dimensions

IDENTIFICATION ➤ F012
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING PSC TYPE)

8-1 90° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

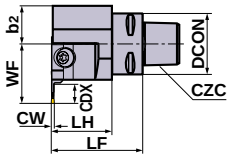


Fig. A

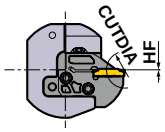
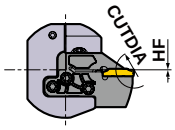
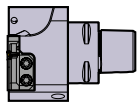


Fig. B





Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.	CZC
D	.079 .088	.236	.472	Modular	R	C3-GYHRCX90-M20L	○	GYM20LA-D06	●	A	C3
					L	C3-GYHLCX90-M20R	○	GYM20RA-D06	●	A	
				Modular	R	C4-GYHRD90-M25L	○	GYM25LA-D06	●	A	C4
					L	C4-GYHLD90-M25R	○	GYM25RA-D06	●	A	
				Modular	R	C5-GYHRD90-M25L	○	GYM25LA-D06	●	A	C5
					L	C5-GYHLD90-M25R	○	GYM25RA-D06	●	A	
				Modular	R	C6-GYHRE90-M25L	○	GYM25LA-D06	●	A	C6
					L	C6-GYHLE90-M25R	○	GYM25RA-D06	●	A	
		.394	.787	Modular	R	C3-GYHRCX90-M20L	○	GYM20LA-D10	●	A	C3
					L	C3-GYHLCX90-M20R	○	GYM20RA-D10	●	A	
		.472	.945	Modular	R	C4-GYHRD90-M25L	○	GYM25LA-D12	●	A	C4
					L	C4-GYHLD90-M25R	○	GYM25RA-D12	●	A	
				Modular	R	C5-GYHRD90-M25L	○	GYM25LA-D12	●	A	C5
					L	C5-GYHLD90-M25R	○	GYM25RA-D12	●	A	
				Modular	R	C6-GYHRE90-M25L	○	GYM25LA-D12	●	A	C6
					L	C6-GYHLE90-M25R	○	GYM25RA-D12	●	A	
		.709*4	1.417	Modular	R	C3-GYHRCX90-M20L	○	GYM20LB-D18	●	B	C3
					L	C3-GYHLCX90-M20R	○	GYM20RB-D18	●	B	
		.787*1	1.575*2	Modular	R	C4-GYHRD90-M25L	○	GYM25LA-D20	●	B	C4
					L	C4-GYHLD90-M25R	○	GYM25RA-D20	●	B	
				Modular	R	C5-GYHRD90-M25L	○	GYM25LA-D20	●	B	C5
					L	C5-GYHLD90-M25R	○	GYM25RA-D20	●	B	
				Modular	R	C6-GYHRE90-M25L	○	GYM25LA-D20	●	B	C6
					L	C6-GYHLE90-M25R	○	GYM25RA-D20	●	B	

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

● : Inventory maintained. ○ : Inventory maintained.(Available from Summer 2015)

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench *
C3-GYHR/LCX90-M20L/R	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LD90-M25L/R		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LD90-M25L/R			
C6-GYHR/LE90-M25L/R			

Dimensions (inch) *3						Cutting Mode	
DCON	**LF**	**LH**	**WF**	**HF**	**b2**	Clockwise	Anticlockwise
1.260	2.165	1.567	1.024	0	.787	R	
1.260	2.165	1.567	1.024	0	.787		
1.575	2.362	1.567	1.220	0	.984		
1.575	2.362	1.567	1.220	0	.984		
1.969	2.362	1.567	1.299	0	1.024		
1.969	2.362	1.567	1.299	0	1.024		
2.480	2.756	1.882	1.575	0	1.319		
2.480	2.756	1.882	1.575	0	1.319		
1.260	2.165	1.567	1.260	0	.787		
1.260	2.165	1.567	1.260	0	.787		
1.575	2.362	1.567	1.535	0	.984		
1.575	2.362	1.567	1.535	0	.984		
1.969	2.362	1.567	1.614	0	1.024		
1.969	2.362	1.567	1.614	0	1.024		
2.480	2.756	1.882	1.890	0	1.319		
2.480	2.756	1.882	1.890	0	1.319		
1.260	2.165	1.567	1.496	0	.787	L	
1.260	2.165	1.567	1.496	0	.787		
1.575	2.362	1.567	1.772	0	.984		
1.575	2.362	1.567	1.772	0	.984		
1.969	2.362	1.567	1.850	0	1.024		
1.969	2.362	1.567	1.850	0	1.024		
2.480	2.756	1.882	2.126	0	1.319		
2.480	2.756	1.882	2.126	0	1.319		

Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○–Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
D	.079", 2.00mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

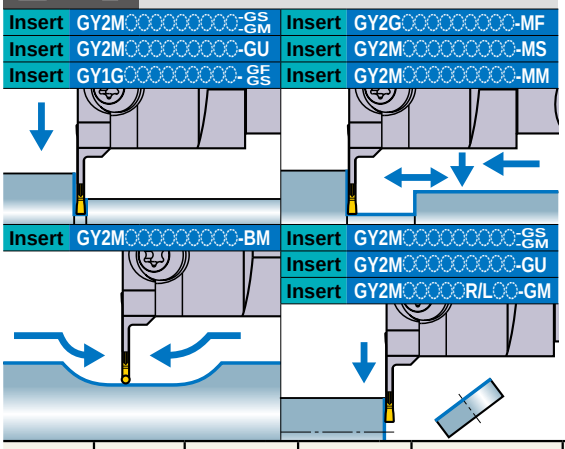
Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
D	.079", 2.00mm	●	●	●	●
	.088", 2.24mm	●			

● : Gauge insert shown dimensions

IDENTIFICATION ➤ F012
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING PSC TYPE)

8-1 90° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

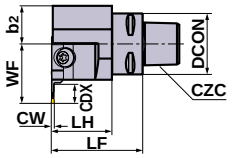


Fig. A

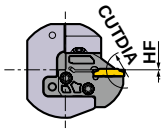
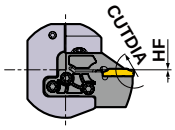
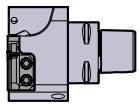


Fig. B





Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.	CZC
E	.094 .098 .108	.236	.472	Modular	R	C3-GYHRCX90-M20L	○	GYM20LA-E06	●	A	C3
					L	C3-GYHLCX90-M20R	○	GYM20RA-E06	●	A	
				Modular	R	C4-GYHRD90-M25L	○	GYM25LA-E06	●	A	C4
					L	C4-GYHLD90-M25R	○	GYM25RA-E06	●	A	
				Modular	R	C5-GYHRD90-M25L	○	GYM25LA-E06	●	A	C5
					L	C5-GYHLD90-M25R	○	GYM25RA-E06	●	A	
				Modular	R	C6-GYHRE90-M25L	○	GYM25LA-E06	●	A	C6
					L	C6-GYHLE90-M25R	○	GYM25RA-E06	●	A	
		.394	.787	Modular	R	C3-GYHRCX90-M20L	○	GYM20LA-E10	●	A	C3
					L	C3-GYHLCX90-M20R	○	GYM20RA-E10	●	A	
		.472	.945	Modular	R	C4-GYHRD90-M25L	○	GYM25LA-E12	●	A	C4
					L	C4-GYHLD90-M25R	○	GYM25RA-E12	●	A	
				Modular	R	C5-GYHRD90-M25L	○	GYM25LA-E12	●	A	C5
					L	C5-GYHLD90-M25R	○	GYM25RA-E12	●	A	
				Modular	R	C6-GYHRE90-M25L	○	GYM25LA-E12	●	A	C6
					L	C6-GYHLE90-M25R	○	GYM25RA-E12	●	A	
		.709*4	1.417	Modular	R	C3-GYHRCX90-M20L	○	GYM20LB-E18	●	B	C3
					L	C3-GYHLCX90-M20R	○	GYM20RB-E18	●	B	
		.787*1	1.575*2	Modular	R	C4-GYHRD90-M25L	○	GYM25LA-E20	●	B	C4
					L	C4-GYHLD90-M25R	○	GYM25RA-E20	●	B	
				Modular	R	C5-GYHRD90-M25L	○	GYM25LA-E20	●	B	C5
					L	C5-GYHLD90-M25R	○	GYM25RA-E20	●	B	
				Modular	R	C6-GYHRE90-M25L	○	GYM25LA-E20	●	B	C6
					L	C6-GYHLE90-M25R	○	GYM25RA-E20	●	B	

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

● : Inventory maintained. ○ : Inventory maintained.(Available from Summer 2015)

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench *
C3-GYHR/LCX90-M20L/R	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LD90-M25L/R		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LD90-M25L/R			
C6-GYHR/LE90-M25L/R			

Dimensions (inch) *3						Cutting Mode	
DCON	**LF**	**LH**	**WF**	**HF**	**b2**	Clockwise	Anticlockwise
1.260	2.165	1.567	1.024	0	.787	R	
1.260	2.165	1.567	1.024	0	.787		
1.575	2.362	1.567	1.220	0	.984		
1.575	2.362	1.567	1.220	0	.984		
1.969	2.362	1.567	1.299	0	1.024		
1.969	2.362	1.567	1.299	0	1.024		
2.480	2.756	1.882	1.575	0	1.319		
2.480	2.756	1.882	1.575	0	1.319		
1.260	2.165	1.567	1.260	0	.787		
1.260	2.165	1.567	1.260	0	.787		
1.575	2.362	1.567	1.535	0	.984		
1.575	2.362	1.567	1.535	0	.984		
1.969	2.362	1.567	1.614	0	1.024		
1.969	2.362	1.567	1.614	0	1.024		
2.480	2.756	1.882	1.890	0	1.319		
2.480	2.756	1.882	1.890	0	1.319		
1.260	2.165	1.567	1.496	0	.787	L	
1.260	2.165	1.567	1.496	0	.787		
1.575	2.362	1.567	1.772	0	.984		
1.575	2.362	1.567	1.772	0	.984		
1.969	2.362	1.567	1.850	0	1.024		
1.969	2.362	1.567	1.850	0	1.024		
2.480	2.756	1.882	2.126	0	1.319		
2.480	2.756	1.882	2.126	0	1.319		

Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	CW \ Breaker	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
E	.094", 2.39mm	●	●	●		●
	.098", 2.50mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

Seat Size	CW \ Breaker	MF	MS	MM	BM
					Ball nose
E	.094", 2.39mm	●			
	.098", 2.50mm	●	●	●	●
	.108", 2.74mm	●			

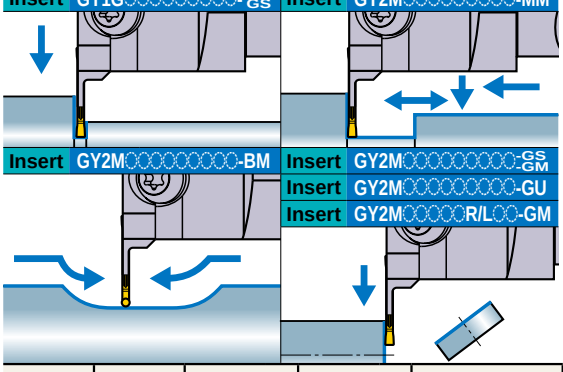
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F012
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING PSC TYPE)

8-1 90° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2M○○○○○○○○○-GU
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM
Insert GY2M○○○○○○○○○-GS/GM
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○R/L○○-GM

(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

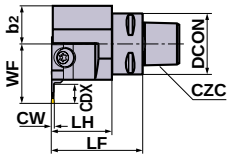


Fig. A

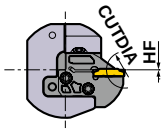
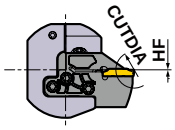
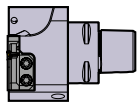


Fig. B





Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.	CZC
F	.118 .125 .128	.236	.472	Modular	R	C3-GYHRCX90-M20L	○	GYM20LA-F06	●	A	C3
					L	C3-GYHLCX90-M20R	○	GYM20RA-F06	●	A	
				Modular	R	C4-GYHRD90-M25L	○	GYM25LA-F06	●	A	C4
					L	C4-GYHLD90-M25R	○	GYM25RA-F06	●	A	
				Modular	R	C5-GYHRD90-M25L	○	GYM25LA-F06	●	A	C5
					L	C5-GYHLD90-M25R	○	GYM25RA-F06	●	A	
				Modular	R	C6-GYHRE90-M25L	○	GYM25LA-F06	●	A	C6
					L	C6-GYHLE90-M25R	○	GYM25RA-F06	●	A	
		.394	.787	Modular	R	C3-GYHRCX90-M20L	○	GYM20LA-F10	●	A	C3
					L	C3-GYHLCX90-M20R	○	GYM20RA-F10	●	A	
		.472	.945	Modular	R	C4-GYHRD90-M25L	○	GYM25LA-F12	●	A	C4
					L	C4-GYHLD90-M25R	○	GYM25RA-F12	●	A	
				Modular	R	C5-GYHRD90-M25L	○	GYM25LA-F12	●	A	C5
					L	C5-GYHLD90-M25R	○	GYM25RA-F12	●	A	
				Modular	R	C6-GYHRE90-M25L	○	GYM25LA-F12	●	A	C6
					L	C6-GYHLE90-M25R	○	GYM25RA-F12	●	A	
		.709*4	1.417	Modular	R	C3-GYHRCX90-M20L	○	GYM20LB-F18	●	B	C3
					L	C3-GYHLCX90-M20R	○	GYM20RB-F18	●	B	
		.787*1	1.575*2	Modular	R	C4-GYHRD90-M25L	○	GYM25LA-F20	●	B	C4
					L	C4-GYHLD90-M25R	○	GYM25RA-F20	●	B	
				Modular	R	C5-GYHRD90-M25L	○	GYM25LA-F20	●	B	C5
					L	C5-GYHLD90-M25R	○	GYM25RA-F20	●	B	
				Modular	R	C6-GYHRE90-M25L	○	GYM25LA-F20	●	B	C6
					L	C6-GYHLE90-M25R	○	GYM25RA-F20	●	B	

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

● : Inventory maintained. ○ : Inventory maintained.(Available from Summer 2015)

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench *
C3-GYHR/LCX90-M20L/R	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LD90-M25L/R		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LD90-M25L/R			
C6-GYHR/LE90-M25L/R			

Dimensions (inch) *3						Cutting Mode	
DCON	**LF**	**LH**	**WF**	**HF**	**b2**	Clockwise	Anticlockwise
1.260	2.165	1.567	1.024	0	.787	R	
1.260	2.165	1.567	1.024	0	.787		
1.575	2.362	1.567	1.220	0	.984		
1.575	2.362	1.567	1.220	0	.984		
1.969	2.362	1.567	1.299	0	1.024		
1.969	2.362	1.567	1.299	0	1.024		
2.480	2.756	1.882	1.575	0	1.319		
2.480	2.756	1.882	1.575	0	1.319		
1.260	2.165	1.567	1.260	0	.787		
1.260	2.165	1.567	1.260	0	.787		
1.575	2.362	1.567	1.535	0	.984		
1.575	2.362	1.567	1.535	0	.984		
1.969	2.362	1.567	1.614	0	1.024		
1.969	2.362	1.567	1.614	0	1.024		
2.480	2.756	1.882	1.890	0	1.319		
2.480	2.756	1.882	1.890	0	1.319		
1.260	2.165	1.567	1.496	0	.787	L	
1.260	2.165	1.567	1.496	0	.787		
1.575	2.362	1.567	1.772	0	.984		
1.575	2.362	1.567	1.772	0	.984		
1.969	2.362	1.567	1.850	0	1.024		
1.969	2.362	1.567	1.850	0	1.024		
2.480	2.756	1.882	2.126	0	1.319		
2.480	2.756	1.882	2.126	0	1.319		

Select an Insert

Seat Size	Insert Number
F	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU Neutral	GS Neutral	GM Neutral	05-GM Hand	GFGS Neutral
F	.118", 3.00mm	●	●	●	●	●
	.125", 3.18mm	●	●	●		●

For Multifunctional Grooving ➤ F014, F015

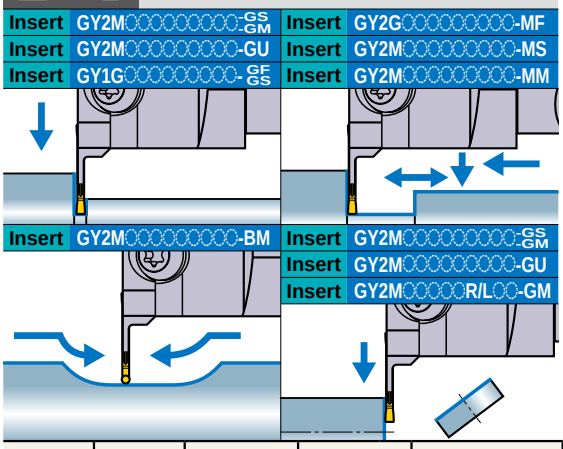
Seat Size	Breaker / CW	MF	MS	MM	BM Ball nose
F	.118", 3.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24mm	●			

● : Gauge insert shown dimensions

IDENTIFICATION ➤ F012
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING PSC TYPE)

8-1 90° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

Fig. A

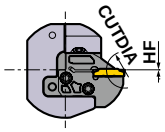
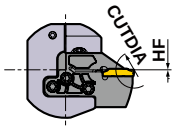
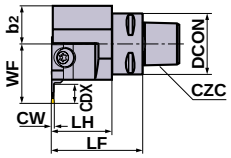
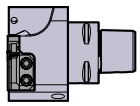


Fig. B







Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.	CZC
G	.157 .167	.315	.630	Modular	R	**C4-GYHRD90-M25L**	○	**GYM25LA-G08**	●	A	C4
					L	**C4-GYHLD90-M25R**	○	**GYM25RA-G08**	●	A	
				Modular	R	**C5-GYHRD90-M25L**	○	**GYM25LA-G08**	●	A	C5
					L	**C5-GYHLD90-M25R**	○	**GYM25RA-G08**	●	A	
				Modular	R	**C6-GYHRE90-M25L**	○	**GYM25LA-G08**	●	A	C6
					L	**C6-GYHLE90-M25R**	○	**GYM25RA-G08**	●	A	
		.472	.945	Modular	R	**C3-GYHRCX90-M20L**	○	**GYM20LA-G12**	●	A	C3
					L	**C3-GYHLCX90-M20R**	○	**GYM20RA-G12**	●	A	
		.551	1.102	Modular	R	**C4-GYHRD90-M25L**	○	**GYM25LA-G14**	●	A	C4
					L	**C4-GYHLD90-M25R**	○	**GYM25RA-G14**	●	A	
				Modular	R	**C5-GYHRD90-M25L**	○	**GYM25LA-G14**	●	A	C5
					L	**C5-GYHLD90-M25R**	○	**GYM25RA-G14**	●	A	
				Modular	R	**C6-GYHRE90-M25L**	○	**GYM25LA-G14**	●	A	C6
					L	**C6-GYHLE90-M25R**	○	**GYM25RA-G14**	●	A	
		.984*1	1.969*2	Modular	R	**C4-GYHRD90-M25L**	○	**GYM25LA-G25**	●	B	C4
					L	**C4-GYHLD90-M25R**	○	**GYM25RA-G25**	●	B	
				Modular	R	**C5-GYHRD90-M25L**	○	**GYM25LA-G25**	●	B	C5
					L	**C5-GYHLD90-M25R**	○	**GYM25RA-G25**	●	B	
				Modular	R	**C6-GYHRE90-M25L**	○	**GYM25LA-G25**	●	B	C6
					L	**C6-GYHLE90-M25R**	○	**GYM25RA-G25**	●	B	

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

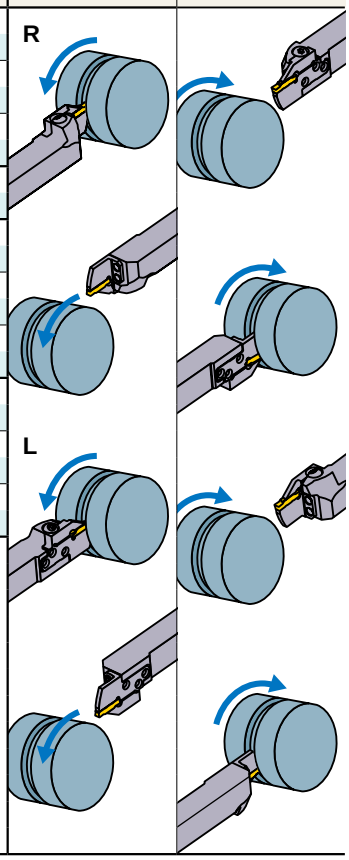
● : Inventory maintained. ○ : Inventory maintained.(Available from Summer 2015)

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench *
C3-GYHR/LCX90-M20L/R	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LD90-M25L/R		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LD90-M25L/R			
C6-GYHR/LE90-M25L/R			

Dimensions (inch) *3						Cutting Mode	
DCON	**LF**	**LH**	**WF**	**HF**	**b2**	Clockwise	Anticlockwise
1.575	2.362	1.567	1.299	0	.984	R	
1.575	2.362	1.567	1.299	0	.984		
1.969	2.362	1.567	1.378	0	1.024		
1.969	2.362	1.567	1.378	0	1.024		
2.480	2.756	1.882	1.654	0	1.319		
2.480	2.756	1.882	1.654	0	1.319		
1.260	2.165	1.567	1.260	0	.787		
1.260	2.165	1.567	1.260	0	.787		
1.575	2.362	1.567	1.535	0	.984		
1.575	2.362	1.567	1.535	0	.984		
1.969	2.362	1.567	1.614	0	1.024		
1.969	2.362	1.567	1.614	0	1.024		
2.480	2.756	1.882	1.890	0	1.319		
2.480	2.756	1.882	1.890	0	1.319		
1.575	2.362	1.567	1.969	0	.984		
1.575	2.362	1.567	1.969	0	.984		
1.969	2.362	1.567	2.047	0	1.024	L	
1.969	2.362	1.567	2.047	0	1.024		
2.480	2.756	1.882	2.323	0	1.319		
2.480	2.756	1.882	2.323	0	1.319		



Select an Insert

Seat Size	Insert Number
G	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
G	.157", 4.00mm	●	●	●	●	●

For Multifunctional Grooving ➤ F014, F015

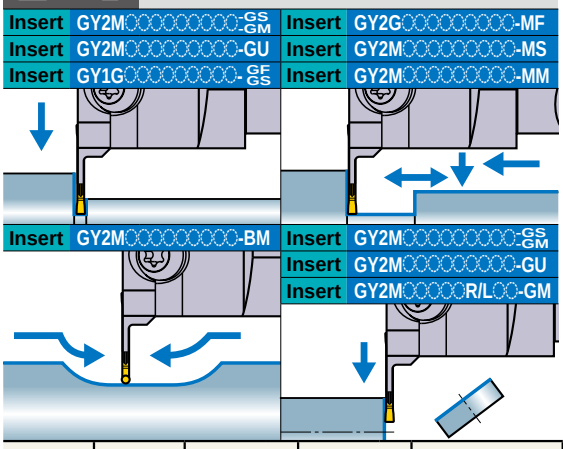
Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
G	.157", 4.00mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24mm	●			

● : Gauge insert shown dimensions

IDENTIFICATION ➤ F012
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

GY SERIES (EXTERNAL GROOVING PSC TYPE)

8-1 90° type holder (Inch)



(Note 1) For modular blades and holders, please order separately.
(Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

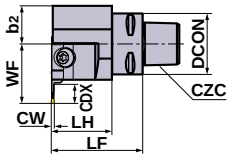


Fig. A

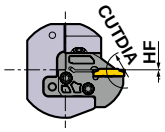
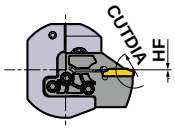
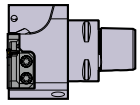


Fig. B





Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.	CZC
H	.187 .197 .206	.315	.630	Modular	R	C4-GYHRD90-M25L	○	GYM25LA-H08	●	A	C4
					L	C4-GYHLD90-M25R	○	GYM25RA-H08	●	A	
				Modular	R	C5-GYHRD90-M25L	○	GYM25LA-H08	●	A	C5
					L	C5-GYHLD90-M25R	○	GYM25RA-H08	●	A	
				Modular	R	C6-GYHRE90-M25L	○	GYM25LA-H08	●	A	C6
					L	C6-GYHLE90-M25R	○	GYM25RA-H08	●	A	
		.472	.945	Modular	R	C3-GYHRCX90-M20L	○	GYM20LA-H12	●	A	C3
					L	C3-GYHLCX90-M20R	○	GYM20RA-H12	●	A	
		.551	1.102	Modular	R	C4-GYHRD90-M25L	○	GYM25LA-H14	●	A	C4
					L	C4-GYHLD90-M25R	○	GYM25RA-H14	●	A	
				Modular	R	C5-GYHRD90-M25L	○	GYM25LA-H14	●	A	C5
					L	C5-GYHLD90-M25R	○	GYM25RA-H14	●	A	
				Modular	R	C6-GYHRE90-M25L	○	GYM25LA-H14	●	A	C6
					L	C6-GYHLE90-M25R	○	GYM25RA-H14	●	A	
		.984*1	1.969*2	Modular	R	C4-GYHRD90-M25L	○	GYM25LA-H25	●	B	C4
					L	C4-GYHLD90-M25R	○	GYM25RA-H25	●	B	
				Modular	R	C5-GYHRD90-M25L	○	GYM25LA-H25	●	B	C5
					L	C5-GYHLD90-M25R	○	GYM25RA-H25	●	B	
				Modular	R	C6-GYHRE90-M25L	○	GYM25LA-H25	●	B	C6
					L	C6-GYHLE90-M25R	○	GYM25RA-H25	●	B	
J	.236 .248 .250	.315	.630	Modular	R	C4-GYHRD90-M25L	○	GYM25LA-J08	●	A	C4
					L	C4-GYHLD90-M25R	○	GYM25RA-J08	●	A	
				Modular	R	C5-GYHRD90-M25L	○	GYM25LA-J08	●	A	C5
					L	C5-GYHLD90-M25R	○	GYM25RA-J08	●	A	
				Modular	R	C6-GYHRE90-M25L	○	GYM25LA-J08	●	A	C6
					L	C6-GYHLE90-M25R	○	GYM25RA-J08	●	A	
		.551	1.102	Modular	R	C4-GYHRD90-M25L	○	GYM25LA-J14	●	A	C4
					L	C4-GYHLD90-M25R	○	GYM25RA-J14	●	A	
				Modular	R	C5-GYHRD90-M25L	○	GYM25LA-J14	●	A	C5
					L	C5-GYHLD90-M25R	○	GYM25RA-J14	●	A	
				Modular	R	C6-GYHRE90-M25L	○	GYM25LA-J14	●	A	C6
					L	C6-GYHLE90-M25R	○	GYM25RA-J14	●	A	
		.984*1	1.969*2	Modular	R	C4-GYHRD90-M25L	○	GYM25LA-J25	●	B	C4
					L	C4-GYHLD90-M25R	○	GYM25RA-J25	●	B	
				Modular	R	C5-GYHRD90-M25L	○	GYM25LA-J25	●	B	C5
					L	C5-GYHLD90-M25R	○	GYM25RA-J25	●	B	
				Modular	R	C6-GYHRE90-M25L	○	GYM25LA-J25	●	B	C6
					L	C6-GYHLE90-M25R	○	GYM25RA-J25	●	B	

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F013 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F013 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F209.

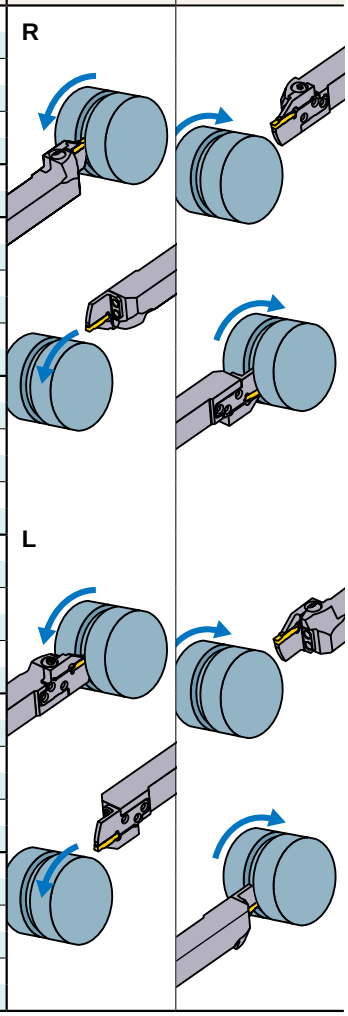
● : Inventory maintained. ○ : Inventory maintained.(Available from Summer 2015)

* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench *
C3-GYHR/LCX90-M20L/R	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LD90-M25L/R		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LD90-M25L/R			
C6-GYHR/LE90-M25L/R			

Dimensions (inch) *3						Cutting Mode	
DCON	**LF**	**LH**	**WF**	**HF**	**b2**	Clockwise	Anticlockwise
1.575	2.362	1.567	1.299	0	.984	R	
1.575	2.362	1.567	1.299	0	.984		
1.969	2.362	1.567	1.378	0	1.024		
1.969	2.362	1.567	1.378	0	1.024		
2.480	2.756	1.882	1.654	0	1.319		
2.480	2.756	1.882	1.654	0	1.319		
1.260	2.165	1.567	1.260	0	.787		
1.260	2.165	1.567	1.260	0	.787		
1.575	2.362	1.567	1.535	0	.984		
1.575	2.362	1.567	1.535	0	.984		
1.969	2.362	1.567	1.614	0	1.024		
1.969	2.362	1.567	1.614	0	1.024		
2.480	2.756	1.882	1.890	0	1.319		
2.480	2.756	1.882	1.890	0	1.319		
1.575	2.362	1.567	1.969	0	.984		
1.575	2.362	1.567	1.969	0	.984		
1.969	2.362	1.567	2.047	0	1.024		
1.969	2.362	1.567	2.047	0	1.024		
2.480	2.756	1.882	2.323	0	1.319		
2.480	2.756	1.882	2.323	0	1.319		
1.575	2.362	1.567	1.299	0	.984	L	
1.575	2.362	1.567	1.299	0	.984		
1.969	2.362	1.567	1.378	0	1.024		
1.969	2.362	1.567	1.378	0	1.024		
2.480	2.756	1.882	1.654	0	1.319		
2.480	2.756	1.882	1.654	0	1.319		
1.575	2.362	1.567	1.535	0	.984		
1.575	2.362	1.567	1.535	0	.984		
1.969	2.362	1.567	1.614	0	1.024		
1.969	2.362	1.567	1.614	0	1.024		
2.480	2.756	1.882	1.890	0	1.319		
2.480	2.756	1.882	1.890	0	1.319		
1.575	2.362	1.567	1.969	0	.984		
1.575	2.362	1.567	1.969	0	.984		
1.969	2.362	1.567	2.047	0	1.024		
1.969	2.362	1.567	2.047	0	1.024		
2.480	2.756	1.882	2.323	0	1.319		
2.480	2.756	1.882	2.323	0	1.319		



Select an Insert

Seat Size	Insert Number
H	**GY○○0475/0500/0524H○○○○−Breaker**
J	**GY○○0600/0631/0635J○○○○−Breaker**

For Grooving/Cutting off ➤ F013, F014

Seat Size	Breaker / CW	GU	GS	GM	05-GM	GFGS
		Neutral	Neutral	Neutral	Hand	Neutral
H	.187", 4.75mm	●	●	●		●
	.197", 5.00mm	●	●	●	●	●
J	.236", 6.00mm	●	●	●		
	.250", 6.35mm	●	●	●		

For Multifunctional Grooving ➤ F014, F015

Seat Size	Breaker / CW	MF	MS	MM	BM
					Ball nose
H	.187", 4.75mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24mm	●			
J	.236", 6.00mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.248", 6.31mm	●			
	.250", 6.35mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			

● : Gauge insert shown dimensions

IDENTIFICATION ➤ F012
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F211

RECOMMENDED CUTTING SPEED (SFM) [For External Grooving]

	Work Material	Hardness	Grade	Cutting Speed (SFM) 165 330 490 655 820 985
P	Mild Steel	≤160HB	VP20RT	330 – 720
			VP10RT	360 – 755
			NX2525	295 – 690
	Carbon Steel Alloy Steel	160–280HB	VP20RT	260 – 590
			VP10RT	295 – 620
			MY5015	360 – 820
			NX2525	230 – 560
		280HB≤	VP20RT	195 – 460
			VP10RT	230 – 490
			MY5015	295 – 690
			NX2525	180 – 440
M	Stainless Steel	≤270HB	VP20RT	195 – 460
			VP10RT	230 – 490
K	Gray Cast Iron	Tensile Strength ≤300MPa	VP20RT	260 – 590
			VP10RT	295 – 620
			MY5015	460 – 985
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	195 – 460
			VP10RT	230 – 490
			MY5015	295 – 690
S	Heat Resistant Alloy Titanium Alloy	–	VP20RT	100 – 195
			VP10RT	130 – 230
			RT9010	130 – 230
H	Hardened steel	50HRC≤	MB8025	260 – 395

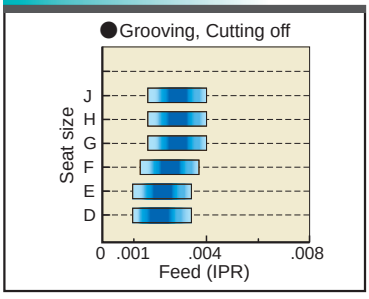
(Note 1) **VP20RT** is the first recommended grade for materials other than hardened steel.
(Note 2) For VP10RT, VP20RT and MY5015, wet cutting is recommended.

RECOMMENDED CUTTING CONDITIONS [For External Grooving]

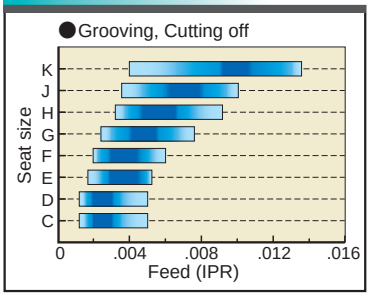
✱Below are the recommended cutting conditions when using the modular type holder GYHR/L2525M00/90-M25R/L with the modular blade GYM25R/LA-○○○.

Recommended feed rate and depth of cut

GU BREAKER



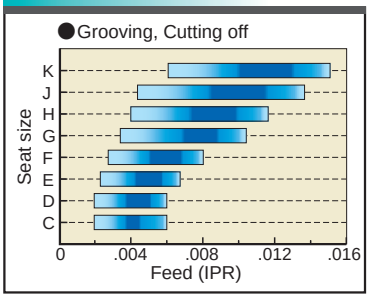
GS BREAKER



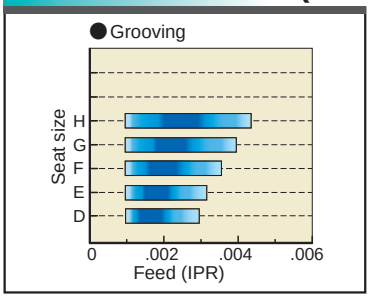
: 1st recommended area

Seat Size	Insert Width
C	.059", 1.50mm
D	.079", 2.00mm .088", 2.24mm
E	.094", 2.39mm .098", 2.50mm .108", 2.74mm
F	.118", 3.00mm .125", 3.18mm .128", 3.24mm
G	.157", 4.00mm .167", 4.24mm
H	.187", 4.75mm .197", 5.00mm .206", 5.24mm
J	.236", 6.00mm .248", 6.31mm .250", 6.35mm
K	.315", 8.00mm

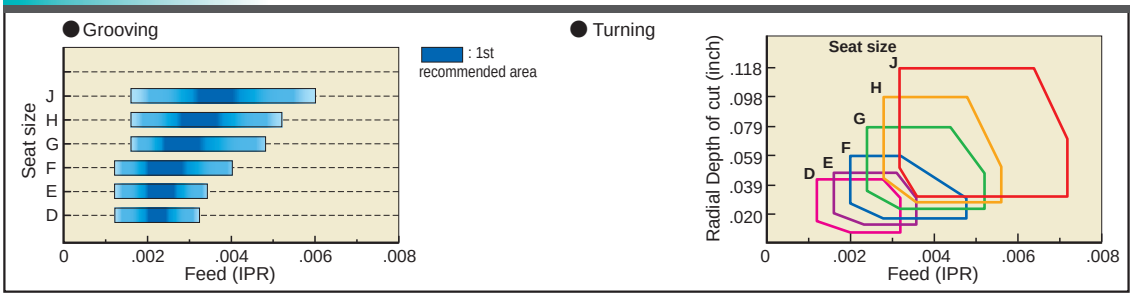
GM BREAKER



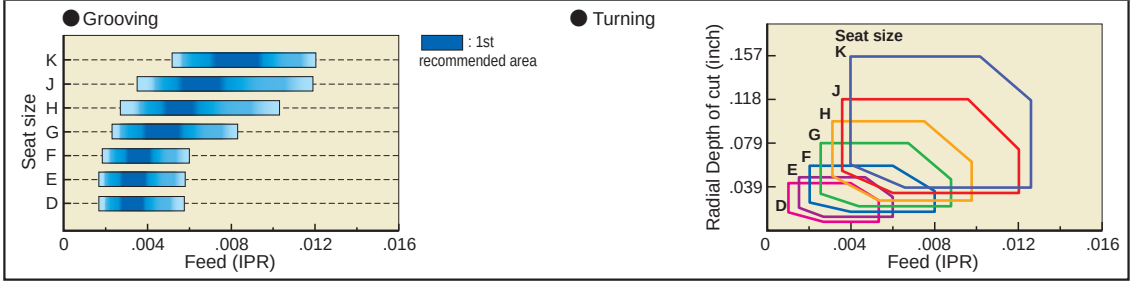
FLAT TOP GFGS (CBN)



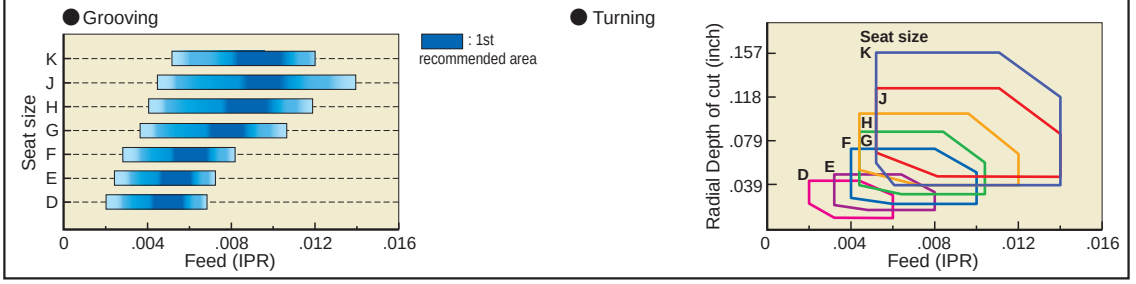
MF BREAKER



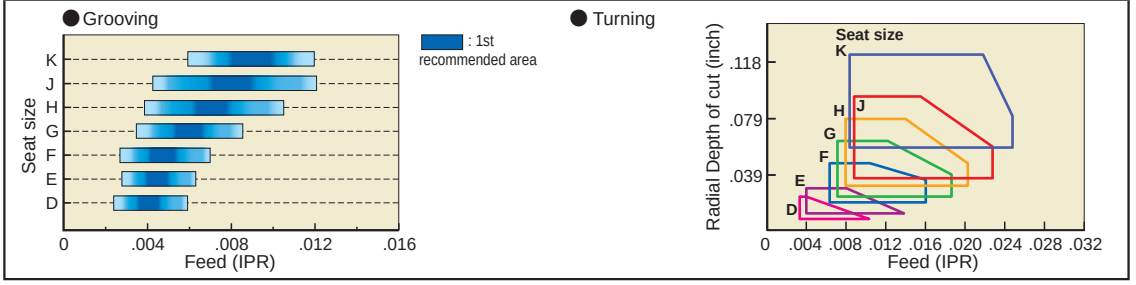
MS BREAKER



MM BREAKER

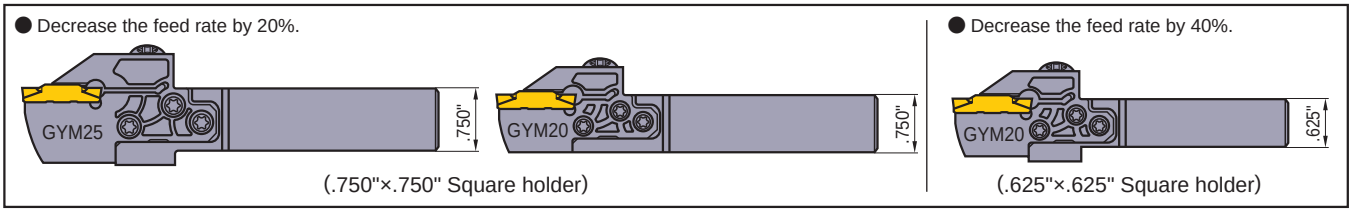


BM BREAKER

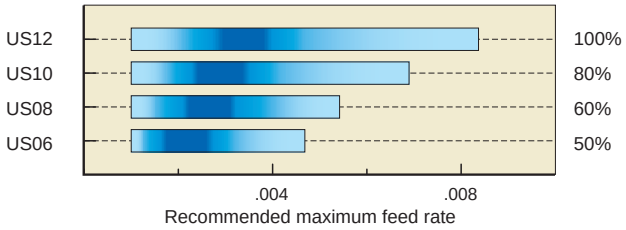


Seat Size	Insert Width
C	.059", 1.50mm
D	.079", 2.00mm .088", 2.24mm
E	.094", 2.39mm .098", 2.50mm .108", 2.74mm
F	.118", 3.00mm .125", 3.18mm .128", 3.24mm
G	.157", 4.00mm .167", 4.24mm
H	.187", 4.75mm .197", 5.00mm .206", 5.24mm
J	.236", 6.00mm .248", 6.31mm .250", 6.35mm
K	.315", 8.00mm

(Note) When using a combination as shown below, decrease the recommended feed rate by 20% and 40% respectively.



For Swiss style lathes mono block holder

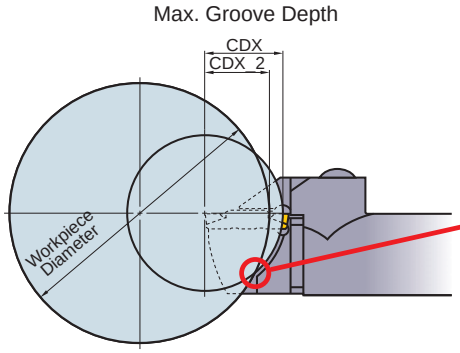


Please refer to the tables above of recommended cutting conditions for external grooving.
Apply the percentage ratio shown of each shank size to the values in those tables.

LIMITATION OF THE MAXIMUM GROOVE DEPTH [For External Grooving]

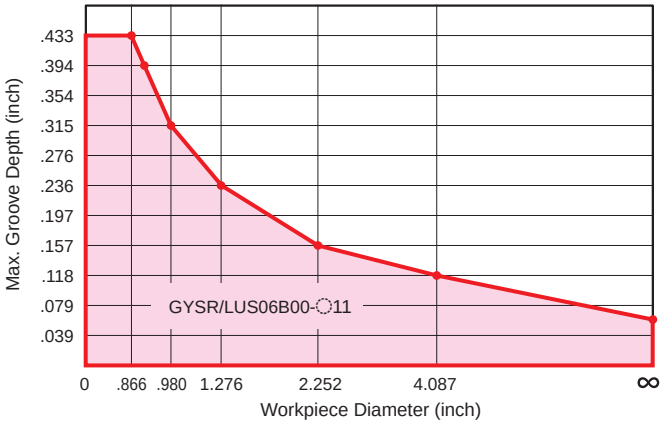
•For Swiss style lathes mono block holder

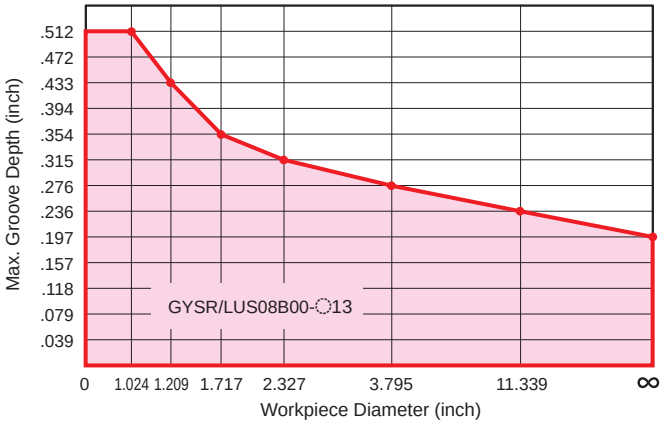
The maximum groove depth is limited by the workpiece diameter.



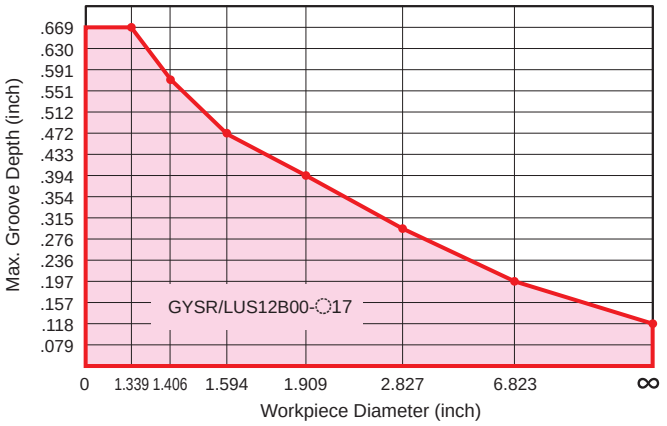


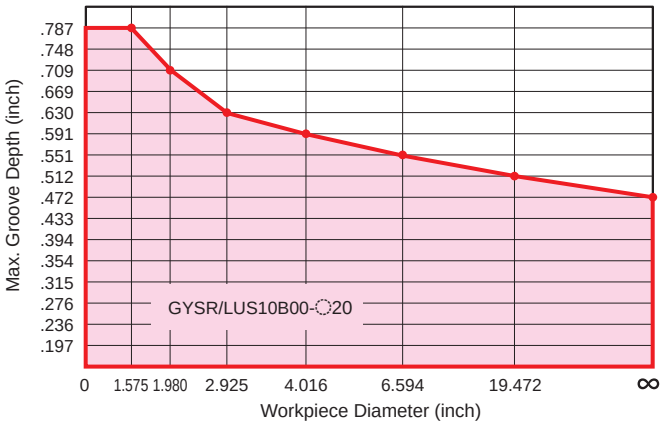
Due to the interference on this part, the maximum groove depth is limited by the workpiece diameter.

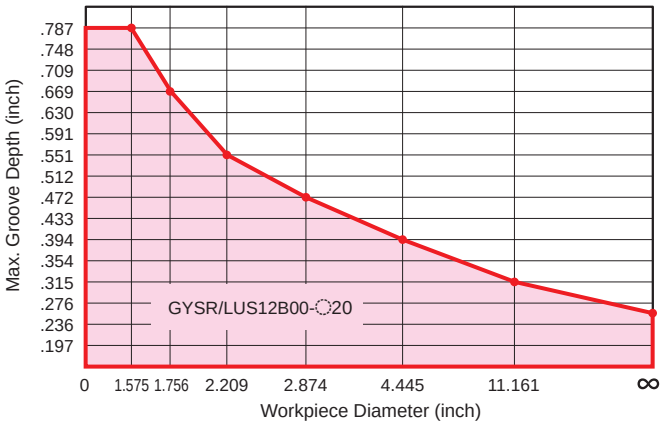








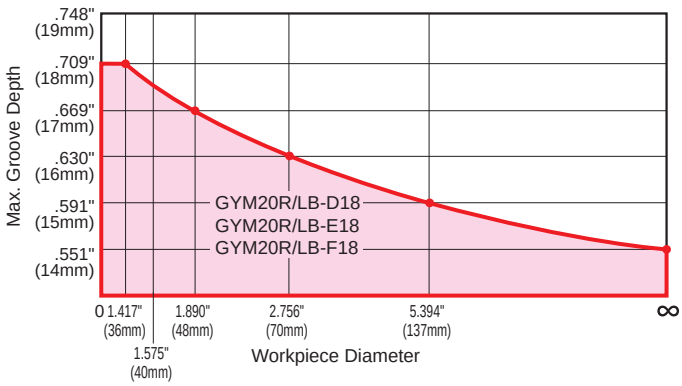




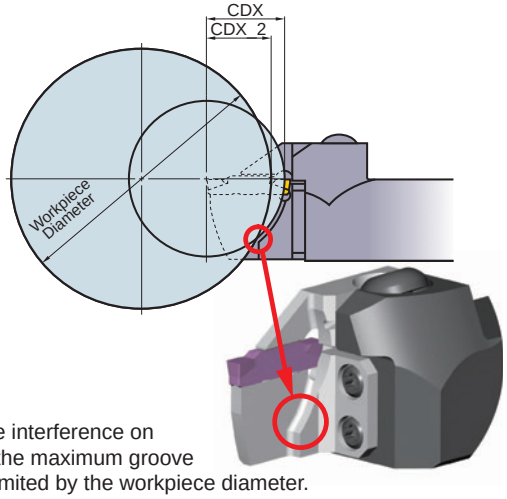
LIMITATION OF THE MAXIMUM GROOVE DEPTH [For External Grooving]

- **When using the modular blade GYM○○R/LA-○○○**
  The maximum groove depth is not limited by the workpiece diameter.

- **When using the modular blade GYM○○R/LB-○○○**
  The maximum groove depth is limited by the workpiece diameter.



Max. Groove Depth



Due to the interference on this part, the maximum groove depth is limited by the workpiece diameter.

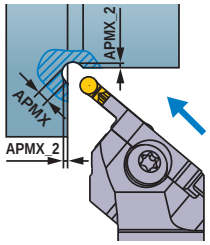
GROOVING

RECOMMENDED CUTTING SPEED (SFM) [For External Recessing]

	Work Material	Hardness	Grade	Cutting Speed (SFM) 165 330 490 655 820
P	Mild Steel	≤180HB	VP20RT	260 – 590
			VP10RT	295 – 620
	Carbon Steel Alloy Steel	180–280HB	VP20RT	195 – 460
			VP10RT	230 – 490
			MY5015	295 – 690
			NX2525	180 – 440
		280–350HB	VP20RT	165 – 360
			VP10RT	195 – 395
			MY5015	260 – 525
			NX2525	150 – 345
M	Stainless Steel	≤350HB	VP20RT	165 – 360
			VP10RT	195 – 395
K	Gray Cast Iron	Tensile Strength ≤350MPa	VP20RT	195 – 460
			VP10RT	230 – 490
			MY5015	295 – 690
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	165 – 360
			VP10RT	195 – 395
			MY5015	260 – 525
S	Titanium Alloy	–	VP20RT	100 – 195
			VP10RT	130 – 230
	Heat Resistant Alloy	–	VP20RT	100 – 195
			VP10RT	130 – 230

(Note 1) VP20RT is the first recommended grade for materials other than hardened steel.
(Note 2) For VP10RT, VP20RT and MY5015, wet cutting is recommended.

DISTANCE FROM THE WORKPIECE TO THE RECESS DEPTH

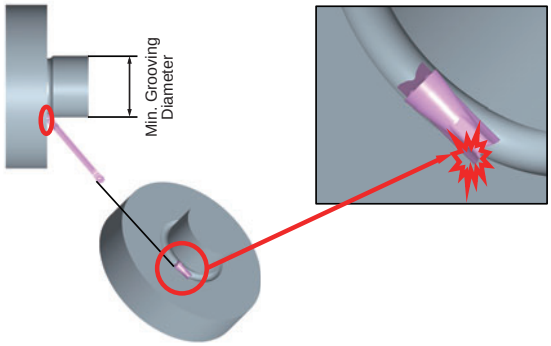


Grooving Width **CW**	Recessing Depth **APMX**	Distance workpiece to the recess depth **APMX_2**
.079", 2.00mm	.059", 1.50mm	.025", 0.646mm
.098", 2.50mm	.069", 1.75mm	.028", 0.720mm
.118", 3.00mm	.079", 2.00mm	.031", 0.793mm
.125", 3.18mm	.082", 2.09mm	.032", 0.819mm
.157", 4.00mm	.098", 2.50mm	.037", 0.939mm
.187", 4.75mm	.113", 2.88mm	.041", 1.049mm
.197", 5.00mm	.118", 3.00mm	.043", 1.086mm
.236", 6.00mm	.138", 3.50mm	.049", 1.232mm
.250", 6.35mm	.145", 3.68mm	.051", 1.283mm

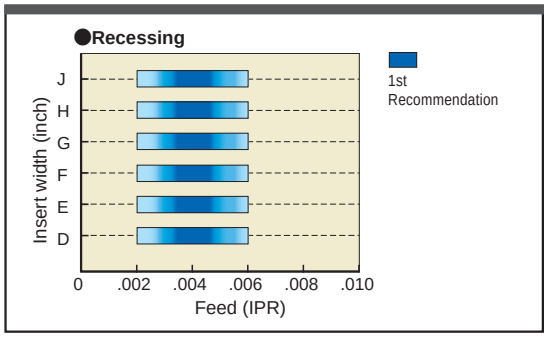
BM BREAKER

Minimum grooving diameter

Ensure the tool is suitable for the diameter being machined. Refer to the Min. Grooving Diameter as shown in the table on the first page to avoid a collision with the workpiece as shown below.

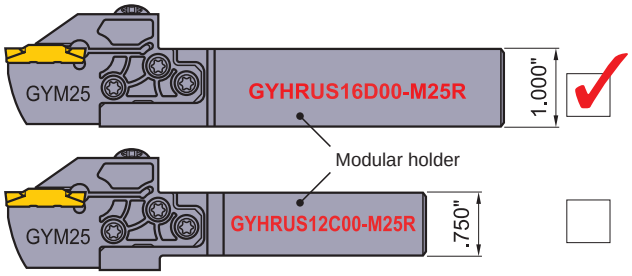


Recommended feed rate and depth of cut



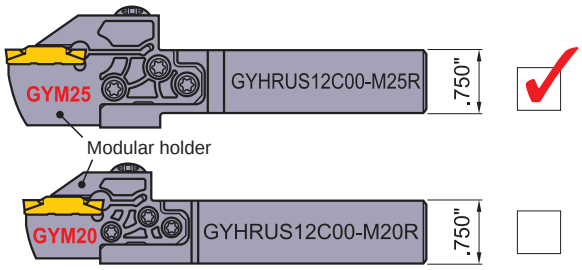
Notes when selecting the tool body

Modular holder



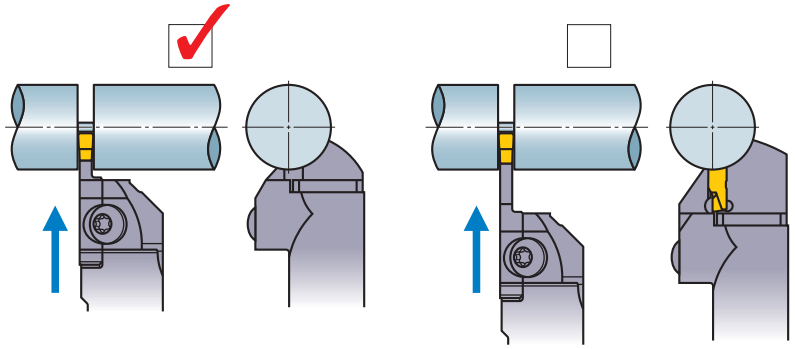
●To ensure sufficient clamping rigidity, select a modular holder with the largest possible shank size.

Modular blade (1)



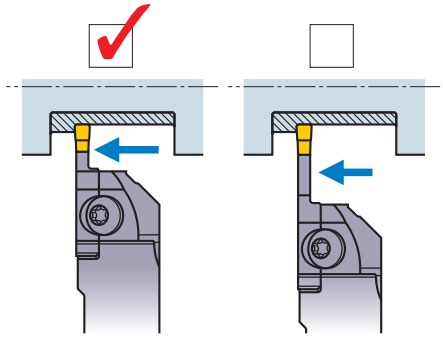
●If there is no restriction for use, select the largest modular blade for the same shank size.

Modular blade (2)



●Select the shortest possible blade suitable for the application.

Modular blade (3)

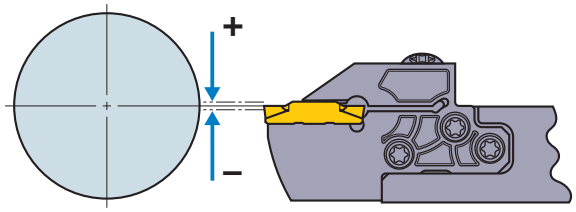


●Select the shortest possible blade suitable for the application.

✓: **Recommended.**

Notes when setting the tool

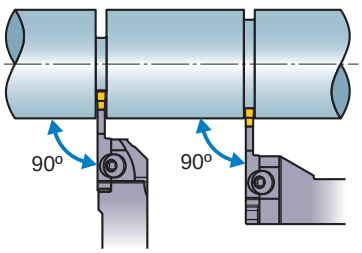
Setting of cutting edge height



<Grooving/Cross-feed machining>
Set the cutting edge height to ±.004" parallel to the central axis.

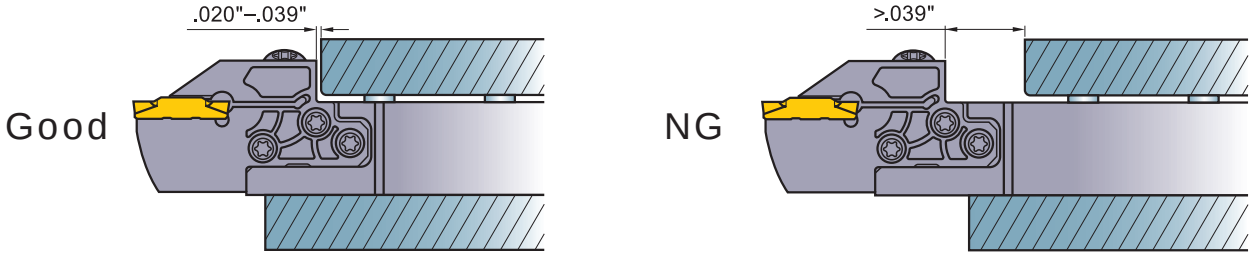
<Cutting off>
Set the cutting edge height to 0–+.008" parallel to the central axis.

Tool body setting angle



●Set the insert perpendicular to the central axis.

Overhang

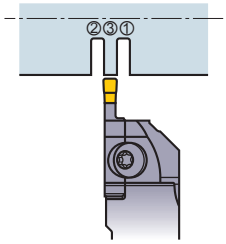


●When setting the tool, ensure that the overhang is as short as possible.

Machining Recommendations

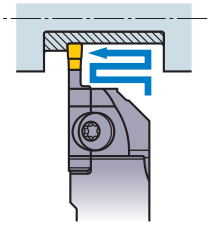
●Notes on multi-functional machining (MF·MS and MM breakers)

Machining narrow grooves



●It is recommended to carry out plunging in several passes. Following the steps above makes it difficult for chips to elongate. This also improves the accuracy of workpiece wall surface.

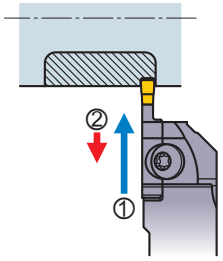
Machining wide grooves



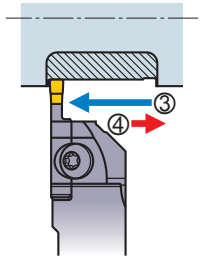
●It is recommended that cross-feed machining is used.

Machining wide grooves

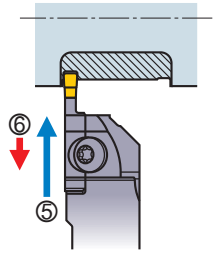
Roughing



①Carry out grooving.
②Retract the tool approx .004".

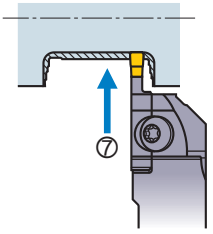


③Carry out cross feed machining.
④Retract the tool approx .004".

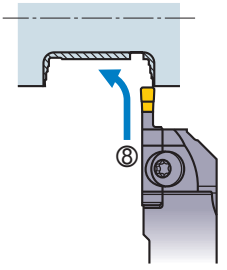


⑤Carry out grooving.
⑥Retract the tool approx .004".
* Repeat the steps ①–⑥.

Finishing

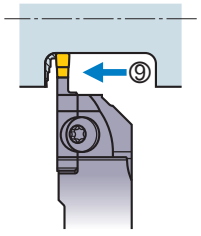


⑦Carry out grooving to the end point of the corner radius.

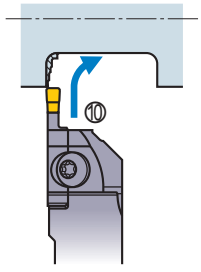


⑧Machining of the wall surface, corner radius and bottom face should be carried out in one process.

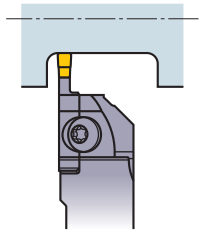
Finishing



⑨Stop at the bottom of the corner radius.

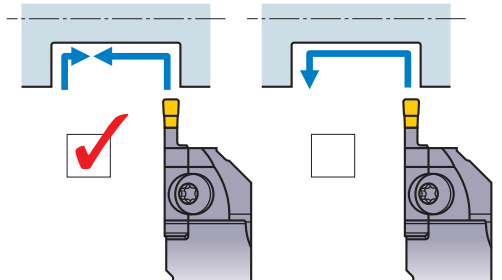


⑩Machine the counter wall to the corner radius in one process.



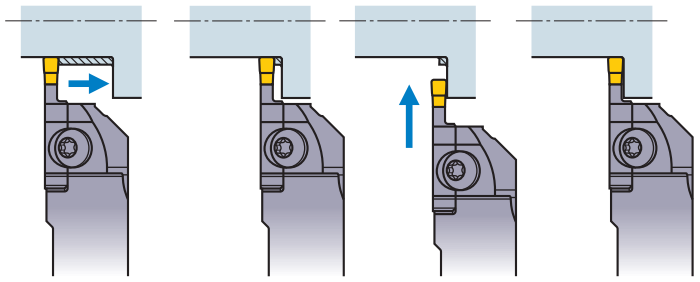
⑪Finish machining.

Precautions when finishing walls



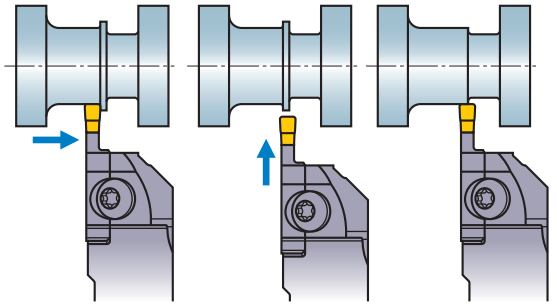
●To produce high accuracy walls using MS or MM breaker insert, do not carry out back turning. Plunging is recommended.

Wall machining



●When machining a wall, chip jamming can occur. In this case, stop cross feed machining just before the wall (at a point less than the insert width) then remove the remaining material by plunging.

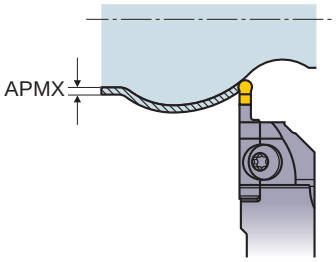
Machining of a ring section



●When a ring remains in a cross feed end process, finish cross feed machining .040"–.059" short of the end point, then remove the ring by plunging.

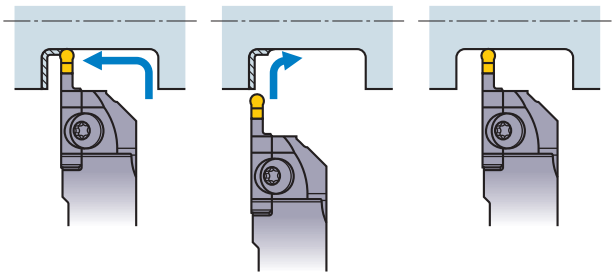
Machining Recommendations

Notes on multi-functional machining (BM breaker)



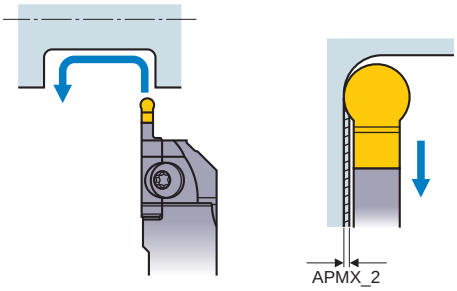
●With the BM breaker insert, 3 dimensional copying is possible.
Set the depth of cut (APMX) to 40% less than the insert width.

Roughing



●Use plunging and cross-feed machining.
When machining the corner, vibration is likely to occur. To avoid this, reduce the feed by 50%.

Finishing



●Carry out finishing in one process.
For the depth of cut (APMX_2) when back turning, refer to the table on the right.

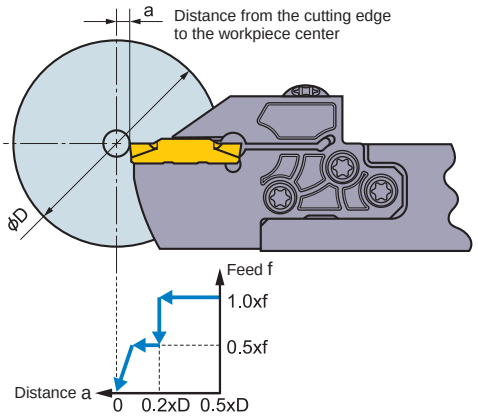
Insert	APMX_2 (inch)
GY2M0200D100N-BM	.002
GY2M0250E125N-BM	.004
GY2M0300F150N-BM	.006
GY2M0318F159N-BM	
GY2M0400G200N-BM	.008
GY2M0475H238N-BM	.009
GY2M0500H250N-BM	
GY2M0600J150N-BM	.012
GY2M0635J318N-BM	
GY2M0800K400N-BM	.016

Machining Recommendations

Notes for cutting off

feed

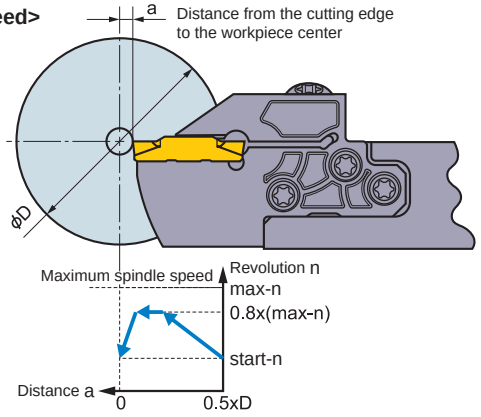
<Feed>



- When the cutting edge approaches the center, reduce the feed by 50%.
- If necessary, stop the feed prior to reaching the center of the workpiece. The part will fall off because of its own weight.

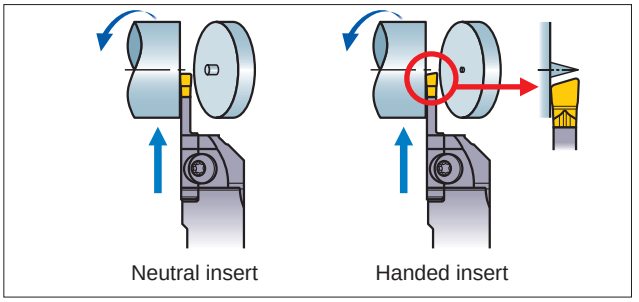
Revolution

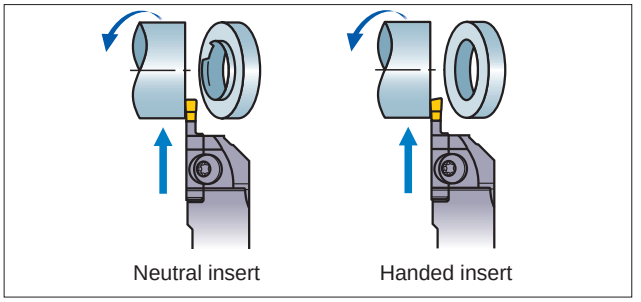
<Spindle speed>



- When using constant cutting speed during a cutting off cycle, it is recommended to limit the spindle speed to 80% of maximum to ensure stability.
- To prevent the workpiece from being expelled, lower the spindle speed before finishing the grooving operation.

insert



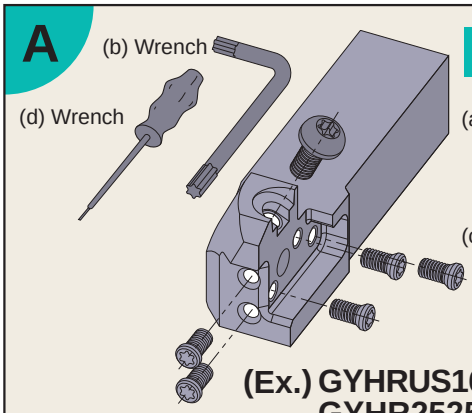


- When there is a center stub on solid bar work or burrs are formed on pipe material, it is possible to decrease them by using a handed insert. With a handed insert, machining tends to be less stable when compared to using a neutral insert. Pay special attention to avoid fracturing of the cutting edge and decrease the feed when necessary.

ASSEMBLY INSTRUCTION

Assembly Procedures

A



Holder

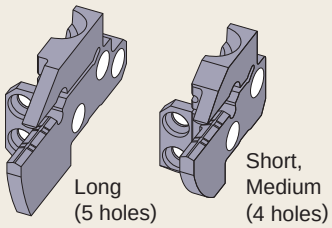
(a) Insert clamp screw x 1pc.

(c) Modular blade set screw x 5pcs.

(Ex.) GYHRUS16D00 - ① M25R
GYHR2525M00 - M25R

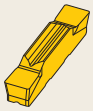
Modular Blade

(Ex.) ② ③
GY M25R A - F 20
GY M25R A - F 12



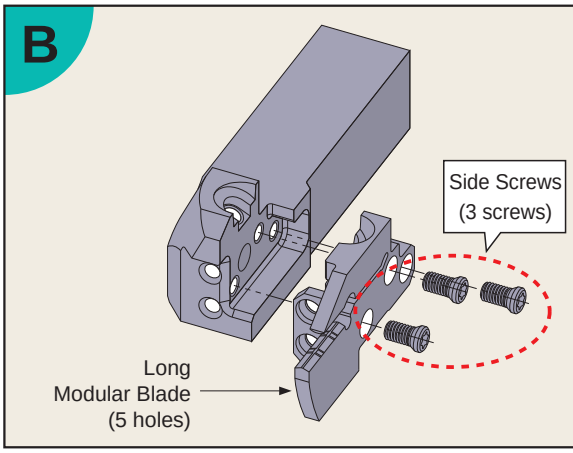
Insert

④
(Ex.)GY2M0300 F 040N-MS
GY2M0318 F 030N-GM

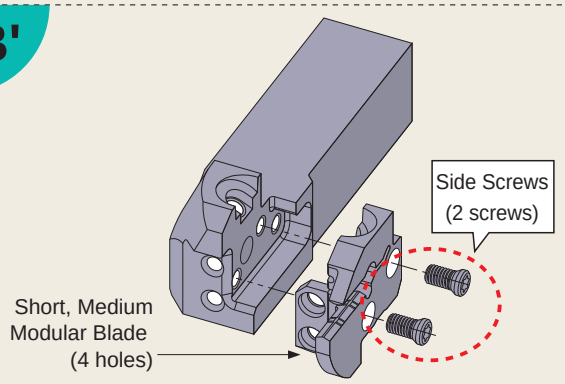


Note 1) ③ and ④ are changed by the insert size.

B

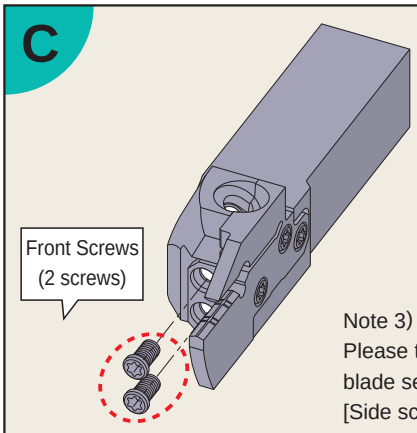


B'



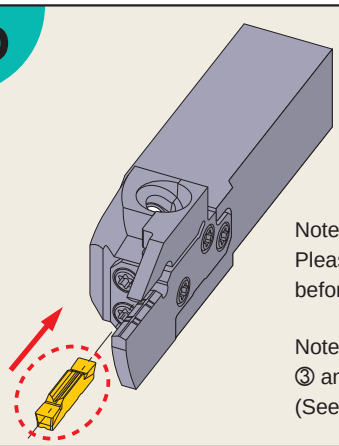
Note 2) ① and ② should be matched. (See caption A)

C



Note 3)
Please tighten the modular blade set screws in order of [Side screws] → [Front screws].

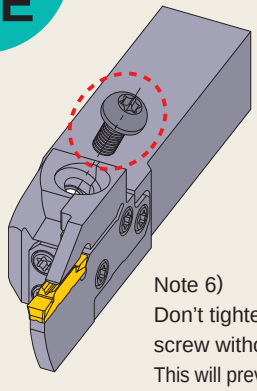
D



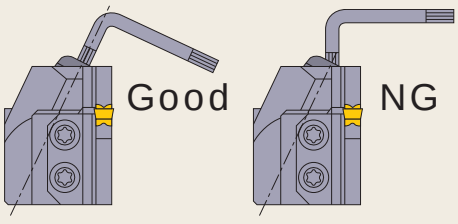
Note 4)
Please clean the insert-seat before installing the insert.

Note 5)
③ and ④ should be matched. (See caption A)

E

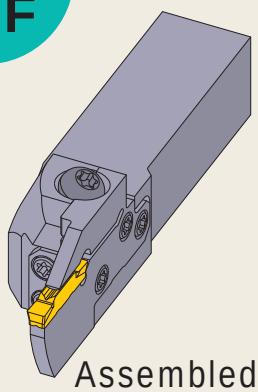


Note 6)
Don't tighten the insert clamp screw without installing the insert.
This will prevent modular blade damage.

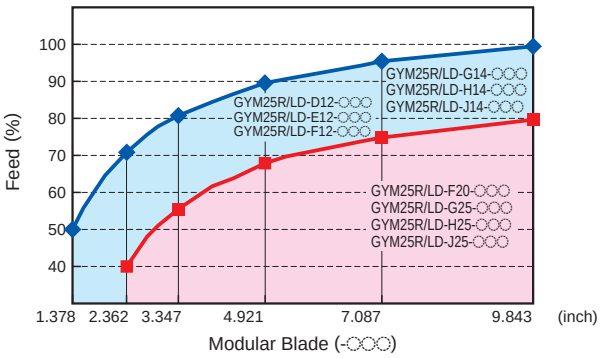


Note 7)
The insert clamp screw is inclined.
Ensure that the wrench is perpendicular to the screw tightening.

F



RELATIONSHIP BETWEEN THE MODULAR BLADE AND FEED PER ROTATION [For Face Grooving]



(Note) Adjust the feed per rotation in the cutting conditions to the percentage shown in the table above.

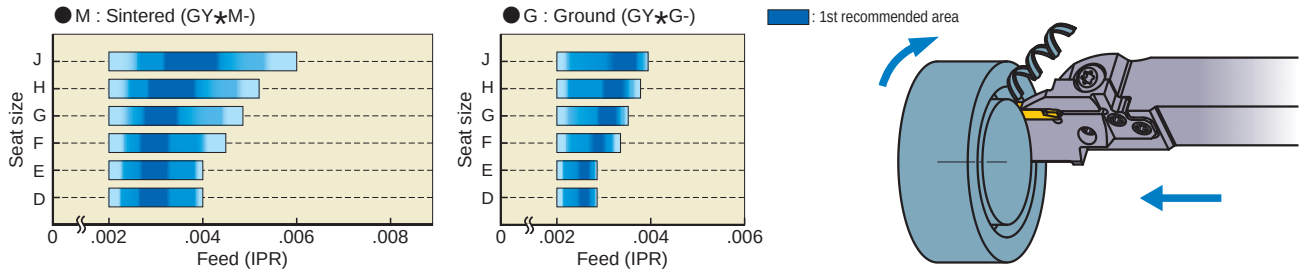
RECOMMENDED CUTTING SPEED (SFM) [For Face Grooving]

	Work Material	Hardness	Grade	Cutting Speed (SFM) 165 330 490 655 820 985
P	Mild Steel	≤160HB	VP20RT	260 – 590
			VP10RT	295 – 620
			NX2525	230 – 560
	Carbon Steel Alloy Steel	160–280HB	VP20RT	195 – 460
			VP10RT	230 – 490
			MY5015	295 – 690
			NX2525	180 – 440
		280HB≤	VP20RT	165 – 360
			VP10RT	195 – 395
			MY5015	260 – 525
			NX2525	150 – 345
M	Stainless Steel	≤270HB	VP20RT	165 – 360
			VP10RT	195 – 395
K	Gray Cast Iron	Tensile Strength ≤300MPa	VP20RT	195 – 460
			VP10RT	230 – 490
			MY5015	295 – 690
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	165 – 360
			VP10RT	195 – 395
			MY5015	260 – 525
S	Heat Resistant Alloy Titanium Alloy	–	VP20RT	100 – 195
			VP10RT	130 – 230
			RT9010	130 – 230
H	Hardened steel	50HRC≤	MB8025	195 – 330

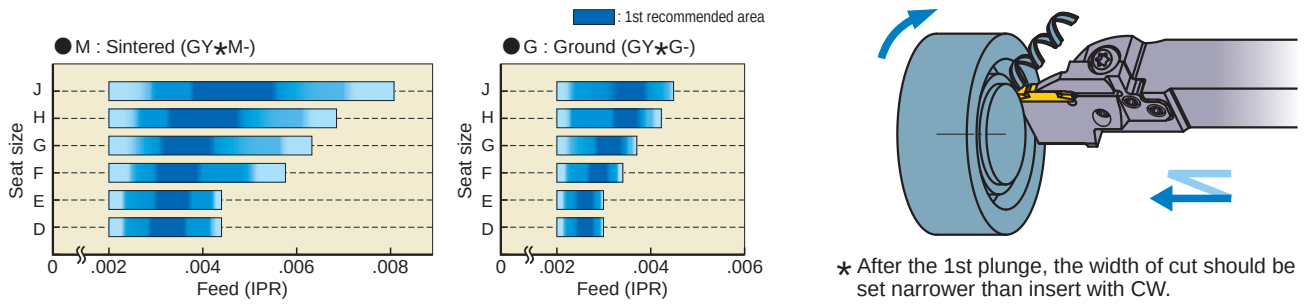
(Note 1) VP20RT is the first recommended grade for materials other than hardened steel.
(Note 2) For VP10RT, VP20RT and MY5015, wet cutting is recommended.

RECOMMENDED CUTTING CONDITIONS [For Face Grooving]

GROOVING

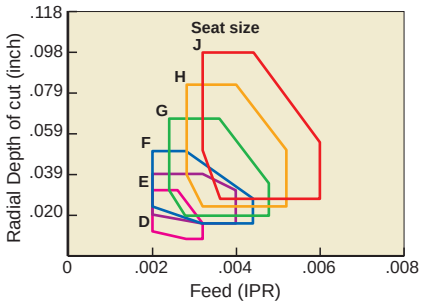


PLUNGING



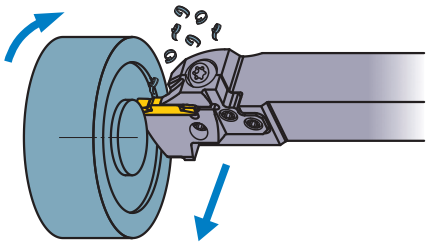
⁎ After the 1st plunge, the width of cut should be set narrower than insert with CW.

TRAVERSE MACHINING (MF BREAKER)

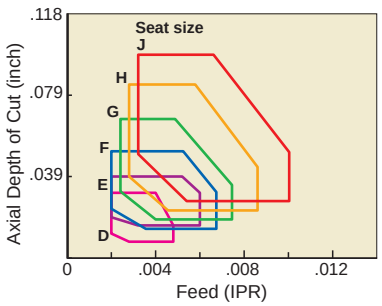


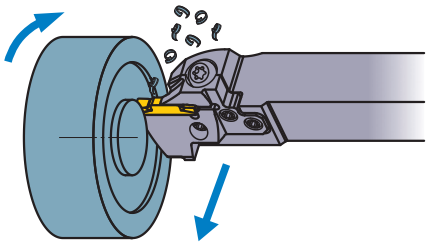
Seat Size	Insert Width
D	.079", 2.00mm .088", 2.24mm
E	.094", 2.39mm .098", 2.50mm .108",2.74mm
F	.118",3.00mm .125", 3.18mm .128", 3.24mm

Seat Size	Insert Width
G	.157", 4.00mm .167", 4.24mm
H	.187", 4.75mm .197", 5.00mm .206", 5.24mm
J	.236", 6.00mm .248", 6.31mm .250", 6.35mm

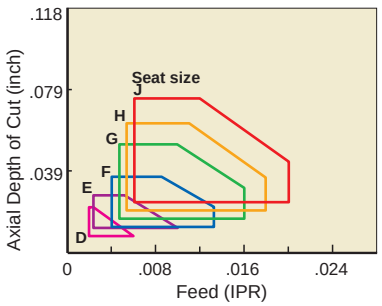


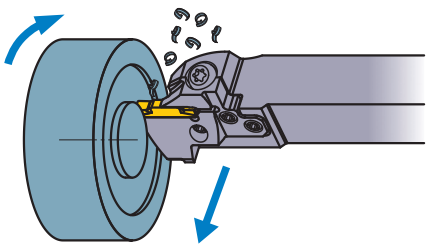
TRAVERSE MACHINING (MM/MS BREAKER)





TRAVERSE MACHINING (BM BREAKER)

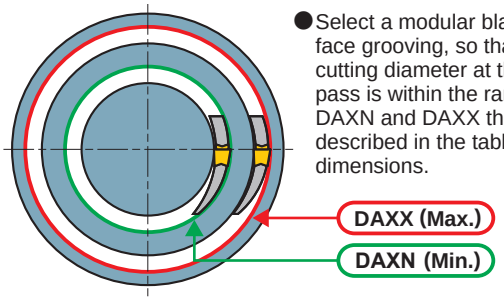




TOOL SELECTION

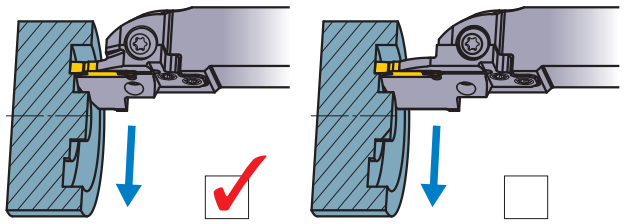
Notes when selecting the tool body

Modular blade (1)



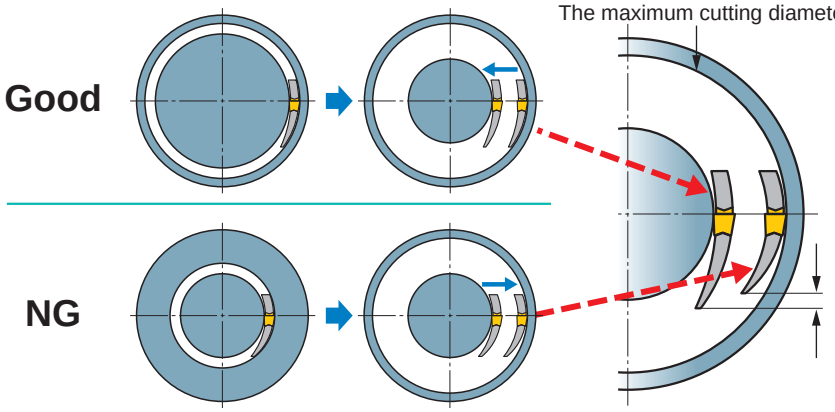
- Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of DAXN and DAXX that are described in the table of dimensions.

Modular blade (2)



- Select the shortest possible blade suitable for the application.

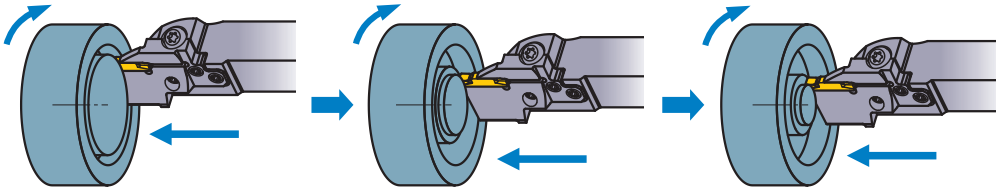
Modular blade (3)



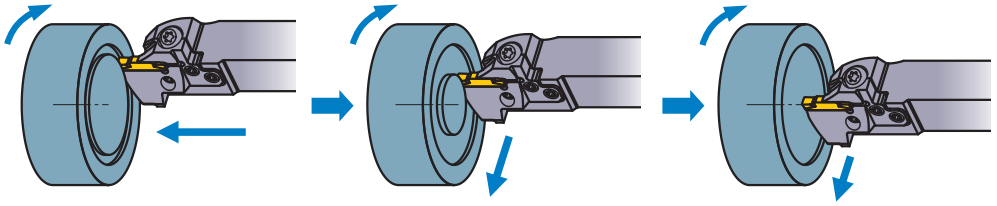
- Select the largest size blade within the maximum cutting diameter of the workpiece.
- Machine from the outer diameter towards the center.
- Increased machining stability and rigidity is possible if a modular blade with the largest possible back metal is used.

- At first, machine the maximum cutting diameter, there is no restriction in the cutting diameter on the remaining process.

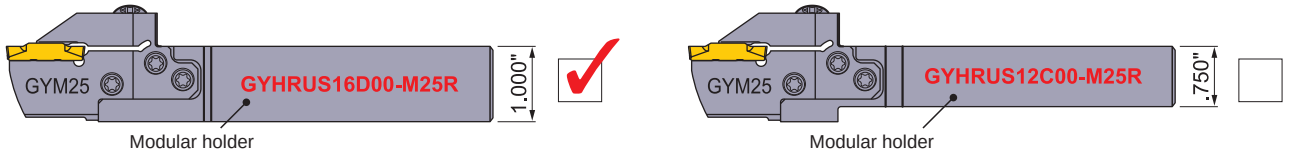
- When plunging in several passes.



- When combining plunging and infeed machining.



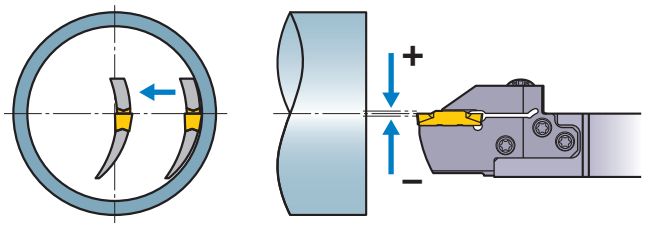
Modular holder



- To ensure sufficient clamping rigidity, select a modular holder with the largest possible shank size.

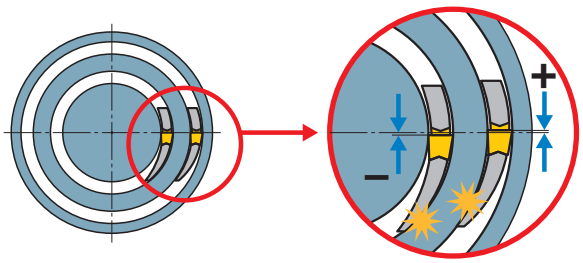
Notes when setting the tool

Setting the cutting edge height



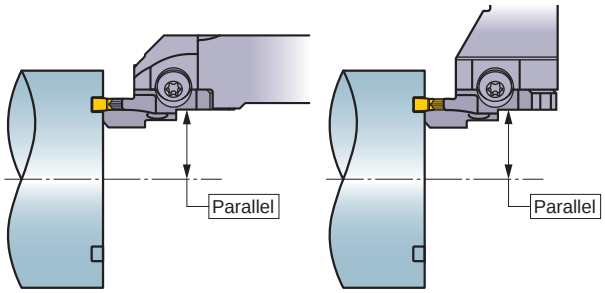
- Set the cutting edge height to ±.004" parallel to the central axis.
- Cutting edge center height check should be done by traverse machining towards the center with a very small depth of cut and ensure that an even surface and no material remains at the center point afterwards.

When interfering the wall of groove and the Modular blade



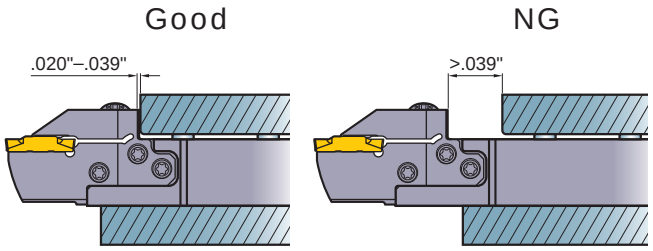
- If interference occurs even when the correct blade is used, the cutting edge height could be incorrect.
  - When interference occurs on the inner side of the blade, the cutting edge height is set too high.
  - When interference occurs on the outer side of the blade, the cutting edge height is set too low.

Setting the tool



- Set the insert parallel to the central axis.

Tool overhang



- When setting the tool, ensure that the overhang is as short as possible.

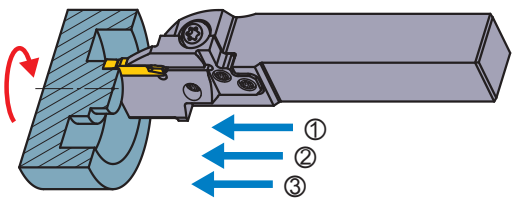
GROOVING

MACHINING RECOMMENDATIONS

Notes when face grooving (1)

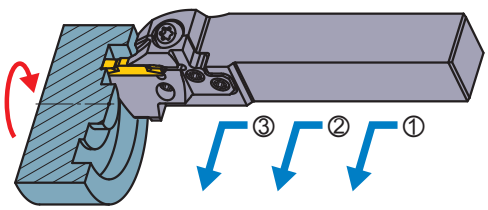
- **Always machine from the outer diameter towards the center.**

Machining narrow grooves



- Plunging in several passes is recommended.

Machining wide grooves

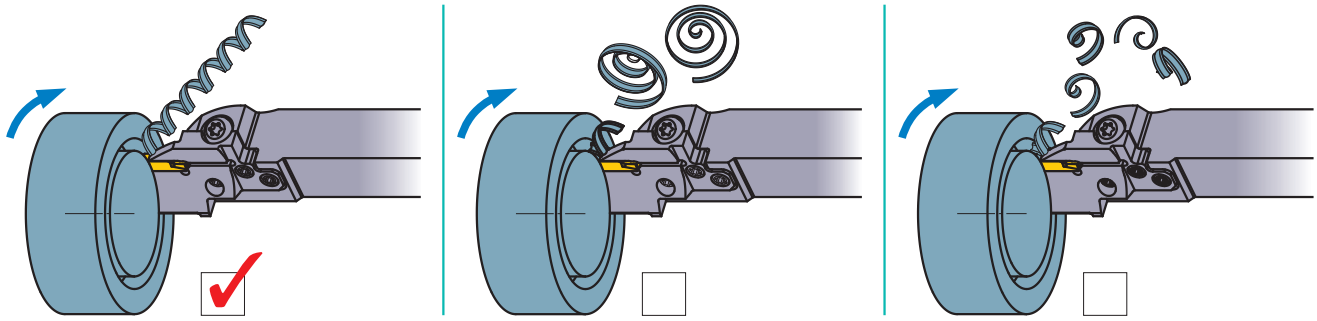


- Cross feed machining is recommended.

MACHINING RECOMMENDATIONS

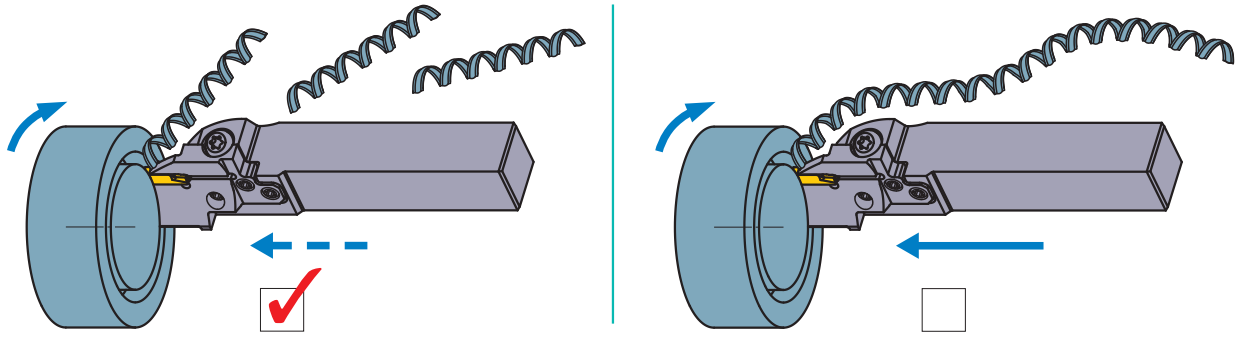
Notes when face grooving (2)

Notes on the first pass (1)



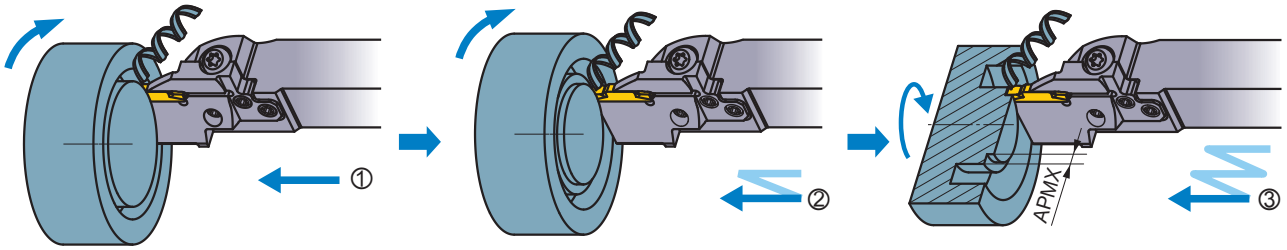
●During the first face grooving pass it is difficult to disperse broken chips and can lead to problems such as a chipped insert. Maintain longer chips that disperse easily by decreasing the feed per rotation.

Notes on the first pass (2)



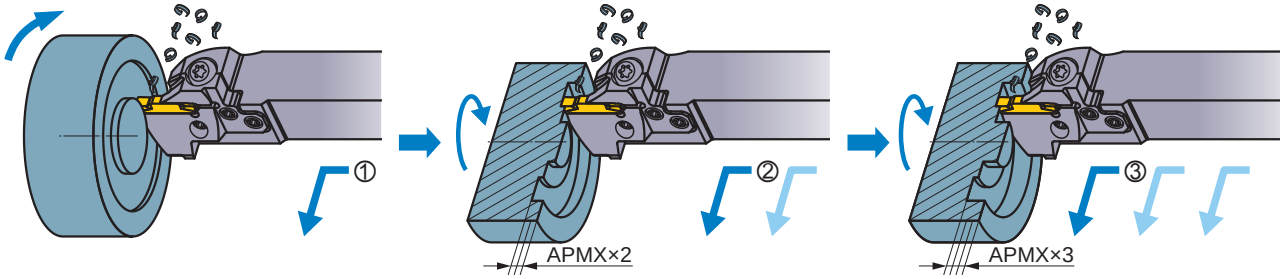
●When chips become too long, use peck feed to break them into a suitable length.

Notes when wide face grooving by plunging in several passes.



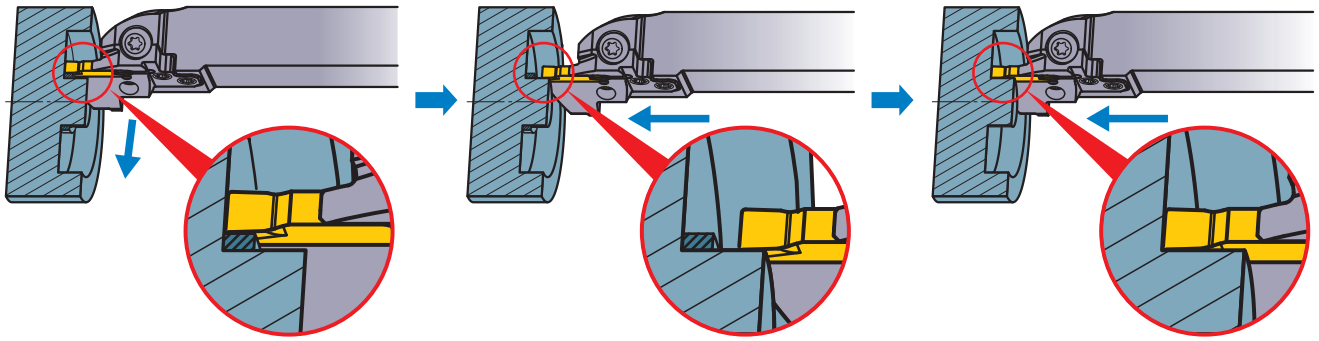
●When machining a face groove in several passes, machine from the outer diameter towards the center so that space for discharging chips is created to prevent insert damage caused by chip jamming.
●Plunging width of cut is recommended to be set at 60 - 80% of the insert width. This enhances the effect of the chipbreaker by enlarging the width of the groove to improve chip dispersal.

Notes when wide face grooving by combination of plunging and traverse machining (1)



●When face groove machining by using plunge feed and traverse machining, always machine from the outer diameter towards the center to disperse chips outward to avoid chip jamming problems.
●Set the depth of cut within 40% of the insert width.

Notes when wide face grooving by combination of plunging and traverse machining (2)



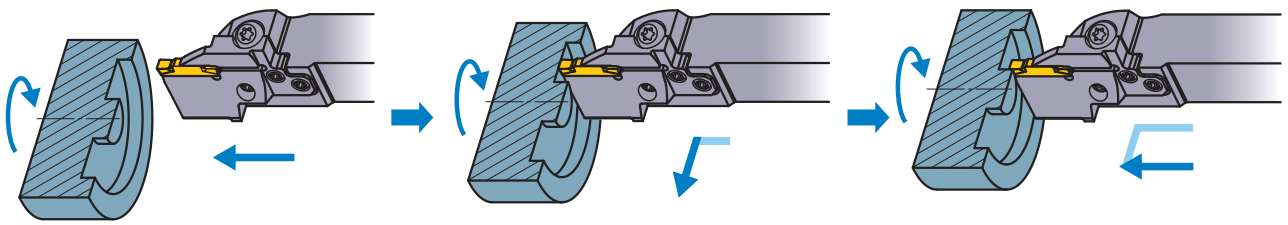
●When infeed machining at the bottom of deep groove, chips may interfere on the cutting edge near the center wall.
In such cases, stop infeed machining just before the center wall (at a point less than the insert width) then remove the remaining material by plunging.

Notes when copying (BM Breaker)



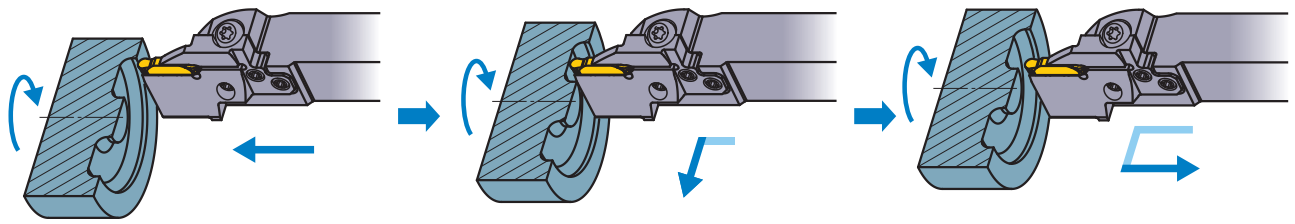
●With the BM breaker insert, 3 dimensional copying is possible. Set the depth of cut (APMX_2) to 30% of the insert width.

Finishing (1)

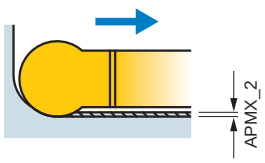


●When finish cutting, machine continuously from the outer wall to the bottom of the groove, then finally plunge cut the center wall.

Finishing (2) (BM Breaker)



●Carry out finishing in one process.
For the depth of cut (APMX_2) when back turning, refer to the table on the right.

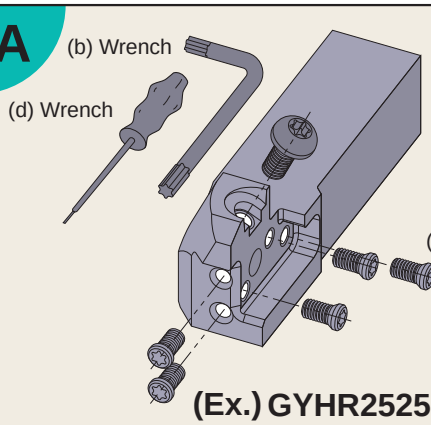


Insert	APMX_2 (inch)
GY2M0200D100N-BM	.004
GY2M0250E125N-BM	
GY2M0300F150N-BM	
GY2M0318F159N-BM	
GY2M0400G200N-BM	.006
GY2M0475H238N-BM	.008
GY2M0500H250N-BM	
GY2M0600J150N-BM	.010
GY2M0635J318N-BM	

ASSEMBLY INSTRUCTION

Assembly procedure

A



Holder

(a) Insert clamp screw x 1pc.

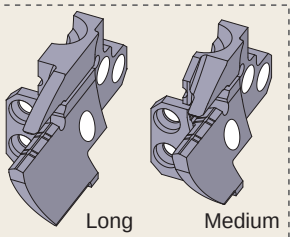
(c) Modular blade set screw x 5pcs.

(Ex.) GYHR2525M00 - M25R ①

Modular Blade

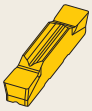
(Ex.) ② ③

GY M25R D - F 20-060
GY M25R D - F 12-060



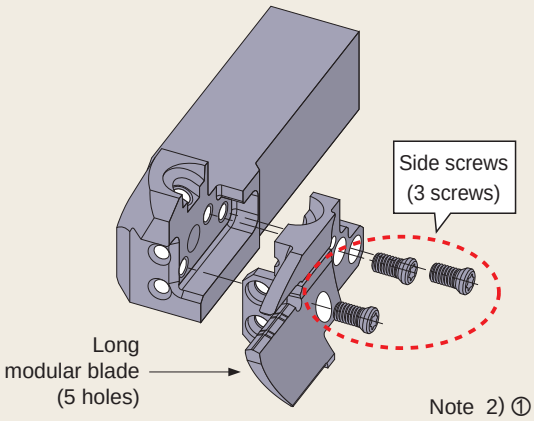
Insert ④

(Ex.)GY2M0300 F 040N-MS
GY2M0318 F 030N-GM



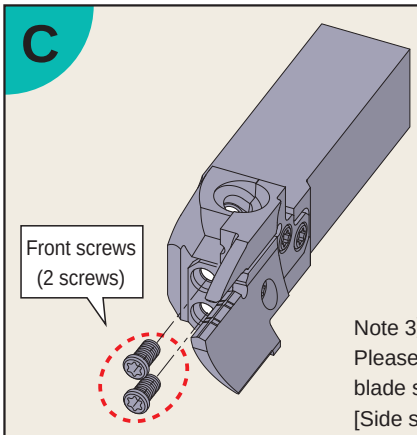
Note 1) ③ and ④ are changed by the insert size.

B



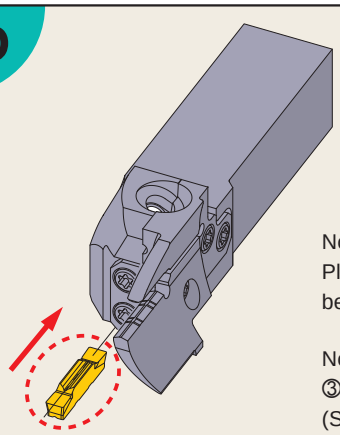
Note 2) ① and ② should be matched. (See caption A)

C



Note 3)
Please tighten the modular blade set screws in order of [Side screws] → [Front screws].

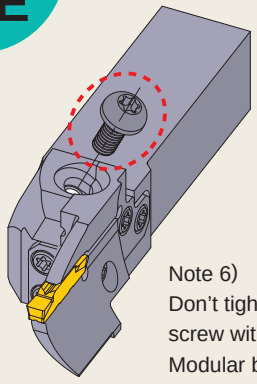
D



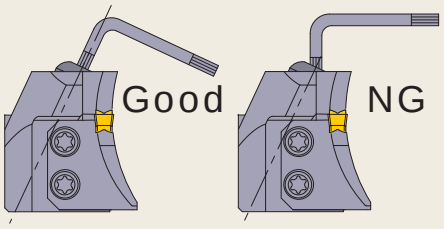
Note 4)
Please clean the insert-seat before installing the insert.

Note 5)
③ and ④ should be matched. (See caption A)

E

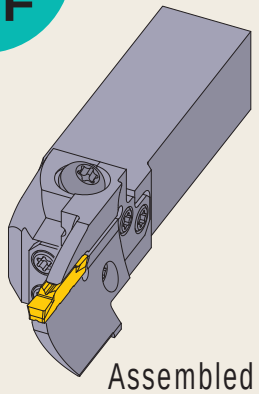


Note 6)
Don't tighten the insert clamp screw without installing the insert. Modular blade might be damaged.



Note 7)
The insert clamp screw is inclined. Ensure that the wrench is perpendicular to the screw tightening.

F

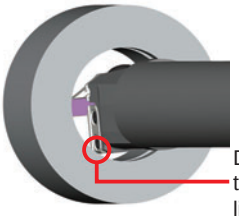


Memo

LIMITATION OF THE MAXIMUM GROOVE DEPTH [For Internal Grooving]

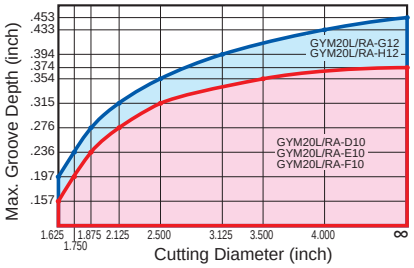
•When using the mono block type
The maximum groove depth is not limited by the cutting diameter.

•When using the modular blade type
The maximum groove depth is limited by the cutting diameter.

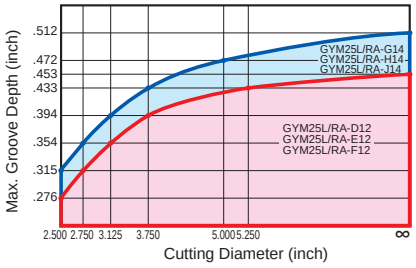


Due to interference of this part, the maximum groove depth is limited by the cutting diameter.

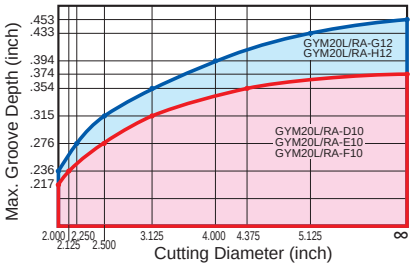
Shank Diameter=1.250inch (GYM20 Blade)



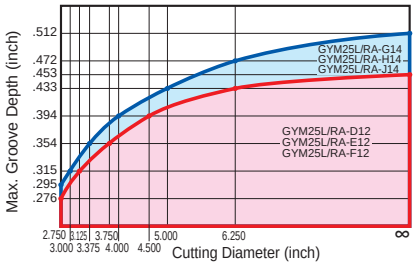
Shank Diameter=1.500inch (GYM25 Blade)



Shank Diameter=1.500inch (GYM20 Blade)



Shank Diameter=2.000inch (GYM25 Blade)



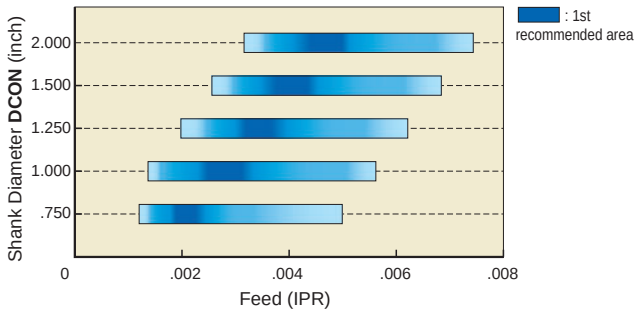
RECOMMENDED CUTTING SPEED (SFM) [For Internal Grooving]

	Work Material	Hardness	Grade	Cutting Speed (SFM) 165 330 490 655 820 985
P	Mild Steel	≤160HB	VP20RT	260 – 590
			VP10RT	295 – 620
			NX2525	230 – 560
	Carbon Steel Alloy Steel	160–280HB	VP20RT	195 – 460
			VP10RT	230 – 490
			MY5015	295 – 690
			NX2525	180 – 440
		280HB≤	VP20RT	165 – 360
			VP10RT	195 – 395
			MY5015	260 – 525
			NX2525	150 – 345
M	Stainless Steel	≤270HB	VP20RT	165 – 360
			VP10RT	195 – 395
K	Gray Cast Iron	Tensile Strength ≤300MPa	VP20RT	195 – 460
			VP10RT	230 – 490
			MY5015	295 – 690
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	165 – 360
			VP10RT	195 – 395
			MY5015	260 – 525
S	Heat Resistant Alloy Titanium Alloy	–	VP20RT	100 – 195
			VP10RT	130 – 230
			RT9010	130 – 230
H	Hardened steel	50HRC≤	MB8025	195 – 330

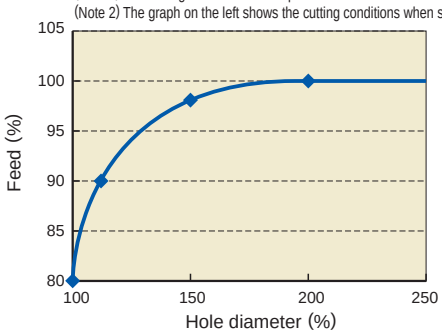
(Note 1) VP20RT is the first recommended grade for materials other than hardened steel.
(Note 2) For VP10RT, VP20RT and MY5015, wet cutting is recommended.

RECOMMENDED CUTTING CONDITIONS [For Internal Grooving]

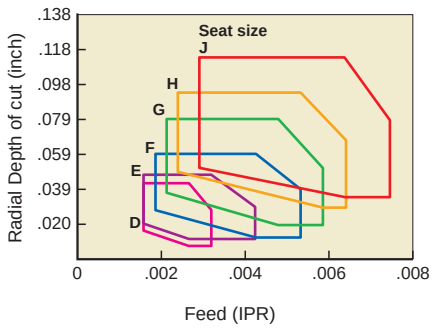
GROOVING



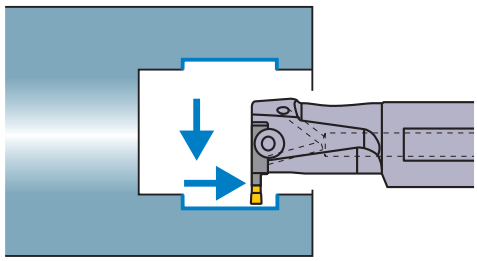
(Note 1) The cutting diameter 100% represents the minimum cutting diameter (DMIN).
(Note 2) The graph on the left shows the cutting conditions when setting the feed to 100%.



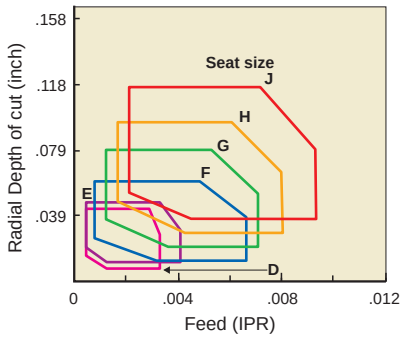
TRAVERSE MACHINING (MF BREAKER)



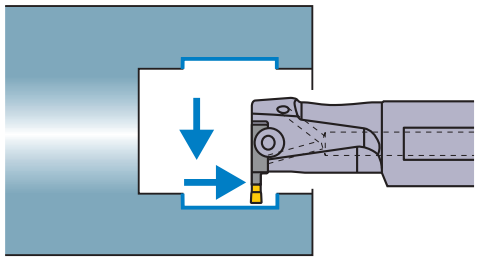
●When traverse machining a blind hole, it is recommended to carry out back turning considering chip disposal.



TRAVERSE MACHINING (MM/MS BREAKER)

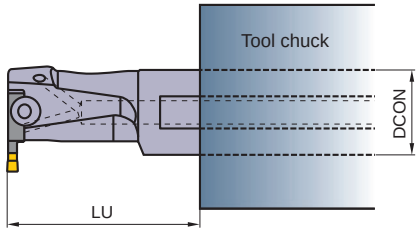


●When traverse machining a blind hole, it is recommended to carry out back turning considering chip disposal.



(Note) The above cutting conditions are for when using the tool overhang (LU) 1.6-2.0 times larger than the shank diameter (DCON). (L/D=1.6-2.0)
When using L/D larger than 2.0, reduce the cutting conditions.

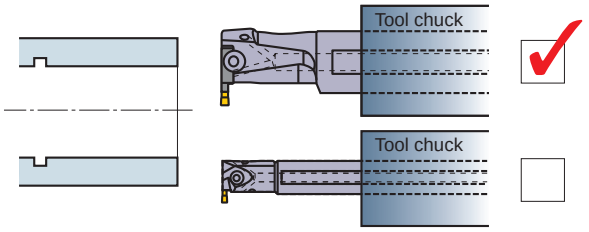
	Seat Size Insert Width
D	.079", 2.00mm .088", 2.24mm
E	.094", 2.39mm .098", 2.50mm .108", 2.74mm
F	.118", 3.00mm .125", 3.18mm .128", 3.24mm
G	.157", 4.00mm .167", 4.24mm
H	.187", 4.75mm .197", 5.00mm .206", 5.24mm
J	.236", 6.00mm .248", 6.31mm .250", 6.35mm



RECOMMENDATIONS FOR INTERNAL GROOVING

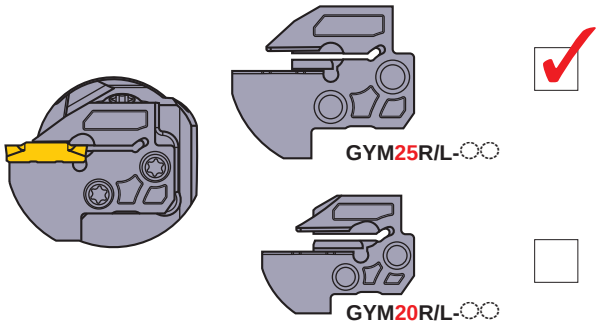
Notes when selecting the tool body

Holder



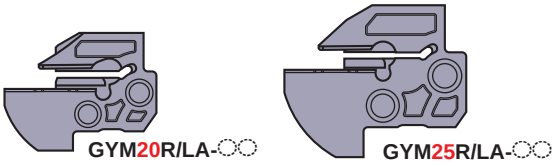
●When the overhang is the same, select a holder with the largest possible shank size to ensure sufficient clamping rigidity.

Modular blade (1)



●For a ø1.5" & ø40mm shank holder, if there is no restriction for use, select a holder suitable for GYM25 blade.

Modular blade (2)

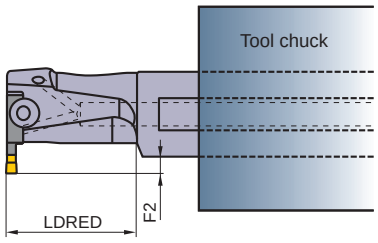


GYM20R/LA-○○	GYM25R/LA-○○
GYM20R/LA-D10	GYM25R/LA-D12
GYM20R/LA-E10	GYM25R/LA-E12
GYM20R/LA-F10	GYM25R/LA-F12
GYM20R/LA-G12	GYM25R/LA-G14
GYM20R/LA-H12	GYM25R/LA-H14
	GYM25R/LA-J14

●For an internal holder, select a modular blade listed above.

Notes when setting the tool

Over hang

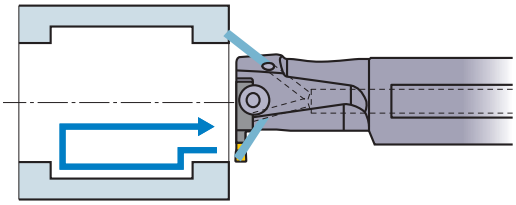


●The maximum groove depth is limited to the dimension LDRED. When machining with longer overhangs, refer to the dimension F2 of the tool used.

Notes on multi-function machining (MS and MM breakers)

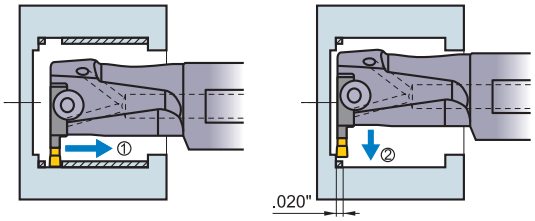
For internal grooving, the machining methods for external grooving (F212 – F213) can be used, but please note the following precautions.

Coolant



●Supply large amounts of coolant for effective chip disposal during cutting. Maintain supply until the tool has been retracted completely for improved chip disposal.

Machining blind holes

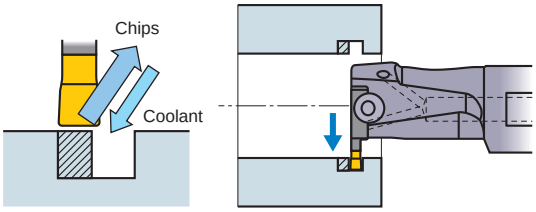


●As continuous chips tend to elongate at the back of the bore, the above operation is recommended.
The recommended width of cut for ② is .020 inch.

Machining Wide Grooves

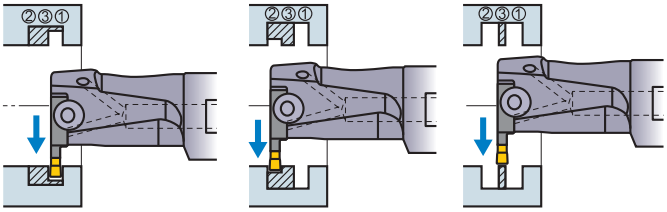
Grooving

●When the insert width is x 2 ≥ groove width



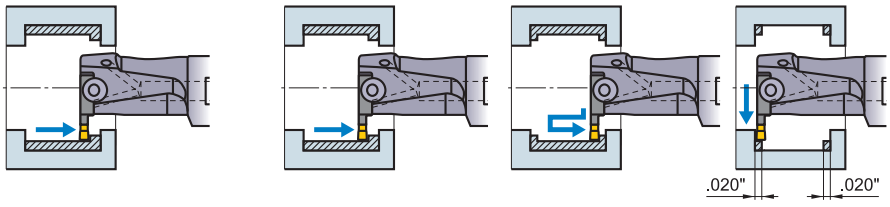
●When the depth of cut is shallower than the insert width, continuous chips are usually produced. When plunging in several passes, it is recommended to carry out machining in the steps above. This ensures that coolant reaches the cutting edge and chips are easily discharged.

●When the insert width is x 2 < groove width



●When the groove depth is larger than the insert width, carry out plunging in the steps above to break up chips efficiently.

Turning

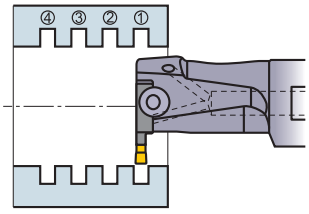


●When chip breaking and disposal are especially important, cross-feed machining is recommended.

●Wide face grooving when the corner R of the workpiece is equal to the corner R of the insert, machine as shown above. (When corner R of the workpiece is larger than corner R of the insert, refer to the description of external wide grooving.)

●If the groove depth exceeds a given level, chips may elongate at the wall. In such a case, increase the feed and carry out machining as shown above.

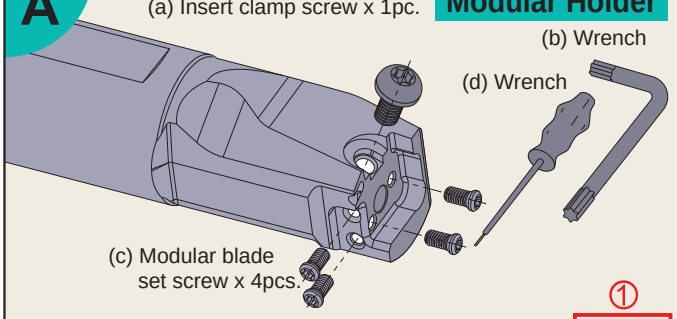
Machining instruction



●It is recommended to carry out grooving from the front end of the workpiece. This reduces workpiece deflection.

ASSEMBLY INSTRUCTION

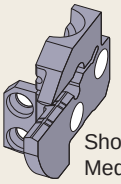
A



(Ex.) GYDLUS24M90D - ① M20R
GYDLUS32P90F - ① M25R

Modular Blade

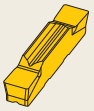
(Ex.) GY ② M20R A - ③ F 10
GY ② M25R A - ③ F 12



Short, Medium (4 holes)

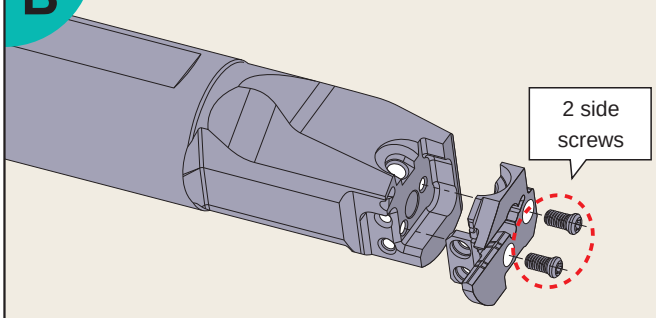
Insert

(Ex.) GY2M0300 ④ F 040N-MS
GY2M0318 ④ F 030N-GM

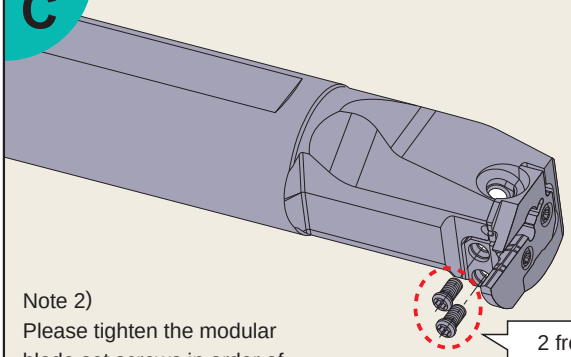


Note 1) ③ and ④ are changed by the insert size.

B

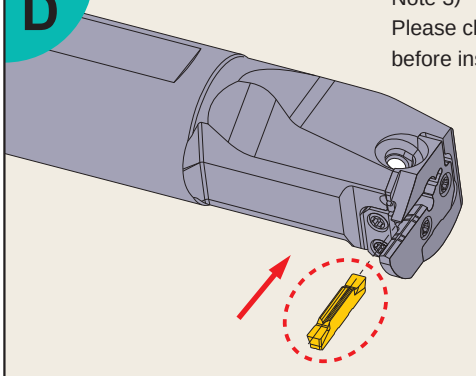


C



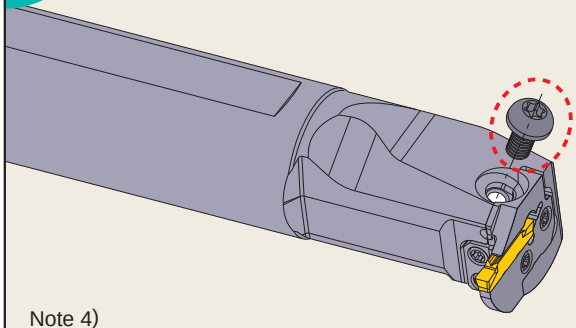
Note 2)
Please tighten the modular blade set screws in order of [Side screws] → [Front screws].

D



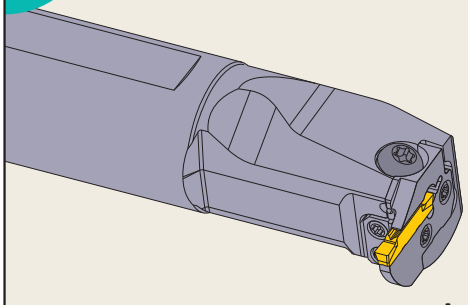
Note 3)
Please clean the insert-seat before installing the insert.

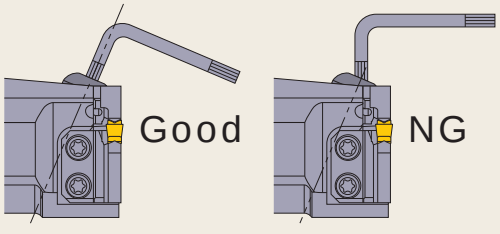
E



Note 4)
Don't tighten the insert clamp screw without installing the insert.
This will prevent modular blade damage.

F



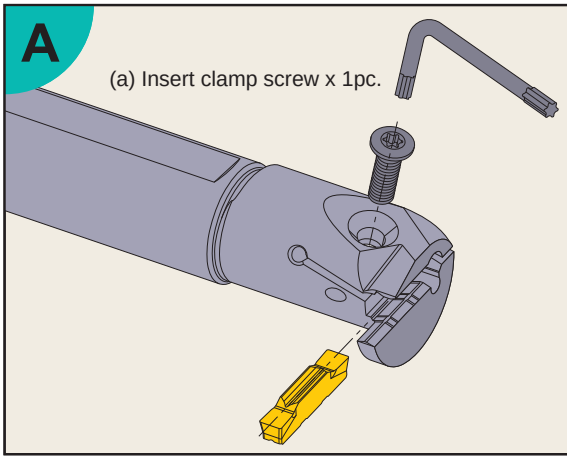


Note 5)
The insert clamp screw is inclined.
Ensure that the wrench is perpendicular to the screw tightening.

INSERT INSTALLATION

A

(a) Insert clamp screw x 1pc.



Holder

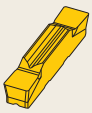
(b) Wrench

Insert

(Ex.) ①

GY2M0300 F 040N - MS

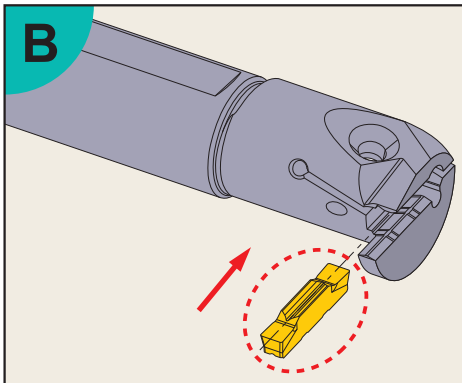
GY2M0318 F 030N - GM



(Ex.) GYAL○○○90○ - ② F 06

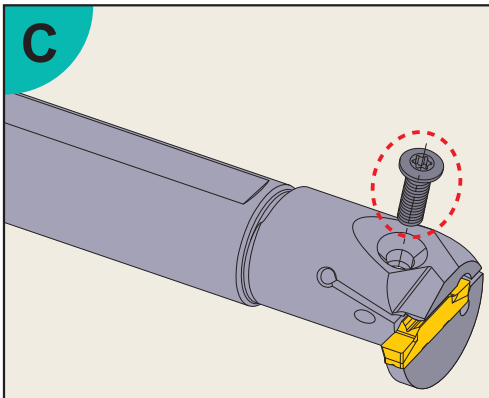
Note 1) ① and ② are changed by the insert size.

B

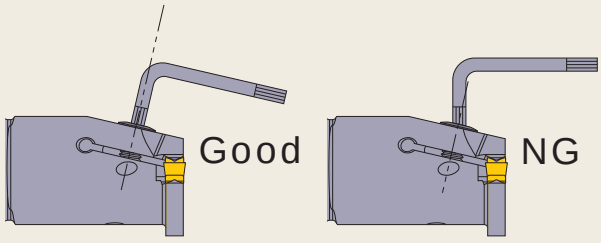


Note 2)
Please clean the insert-seat before installing the insert.

C

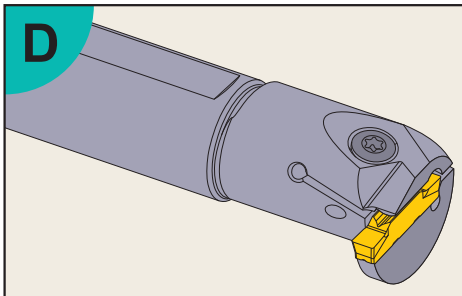


Note 3)
Don't tighten the insert clamp screw
without installing the insert.
This will prevent modular blade damage.



Note 4)
The insert clamp screw is inclined.
Ensure that the wrench is perpendicular to the screw tightening.

D



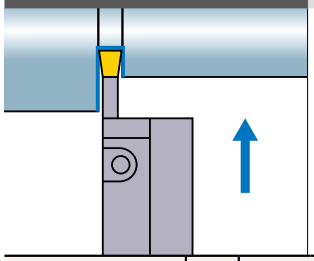
Assembled

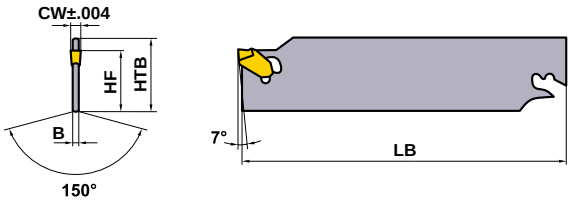
GROOVING

UG HOLDER

- Strengthened insert clamping force.
- Block and blade type and solid type series.
- Groove width .087－.201inch.

UGHN External cutting off, Grooving

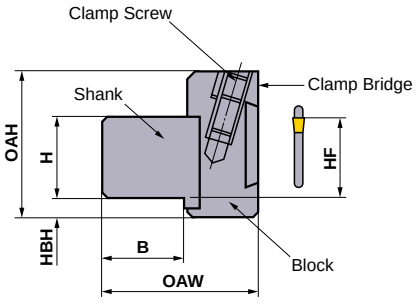


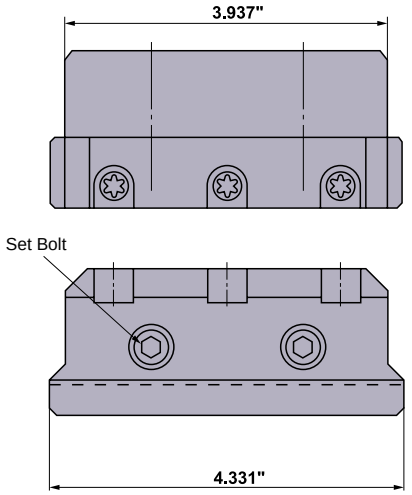


Order Number	Stock	Insert Number		Dimensions (inch)							Wrench	Tool Block
				CW	CUTDIA*1	CDX*2	HTB	B	LB	HF		
UGHN262	●	KGT	2◌	.087	1.970	.787	1.024	.063	4.331	.843	UGS1	KGBN26-19.05-30 KGBN26-25.40-30
UGHN**263**	●		3◌	.122	2.950	1.280	1.024	.093	4.331	.843	UGS1	
UGHN**264**	●		4◌	.161	3.150	1.378	1.024	.126	4.331	.843	UGS1	
UGHN**265**	●		5◌	.201	3.150	1.378	1.024	.157	4.331	.843	UGS1	
UGHN**322**	●		2◌	.087	1.970	.787	1.260	.063	5.906	.984	UGS1	KGBN32-19.05-30 KGBN32-25.40-30
UGHN**323**	●		3◌	.122	3.937	1.772	1.260	.093	5.906	.984	UGS1	
UGHN**324**	●		4◌	.161	3.937	1.772	1.260	.126	5.906	.984	UGS1	
UGHN**325**	●		5◌	.201	4.724	2.165	1.260	.157	5.906	.984	UGS1	

*1 CUTDIA : Max. Cut off Diameter
*2 CDX : Max. Groove Depth

TOOL BLOCK



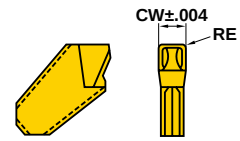
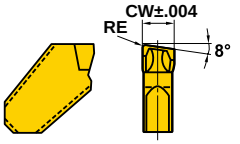


Order Number	Stock	Dimensions (inch)						Clamp Bridge	Clamp Screw	Wrench	Set Bolt	Wrench
		H	HF	HBH	OAH	B	OAW					
KGBN26-19.05-30	●	.750	.750	.470	1.772	.750	1.656	KGC1	LS15T	TKY25R	HSC08016	HKY60R
KGBN**26-25.40-30**	●	1.000	1.000	.220	1.772	1.000	1.906	KGC1	LS15T	TKY25R	HSC08016	HKY60R
KGBN**32-19.05-30**	●	.750	.750	.652	2.047	.750	1.656	KGC1	LS15T	TKY25R	HSC08016	HKY60R
KGBN**32-25.40-30**	●	1.000	1.000	.402	2.047	1.000	1.906	KGC1	LS15T	TKY25R	HSC08016	HKY60R

(Note) When ordering a block, clamp bridge and clamp screw are included.
When ordering a shank, set bolts are included.

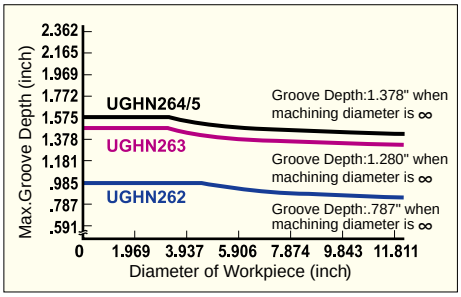
● : Inventory maintained. ▲ : This item to be discontinued within two years.

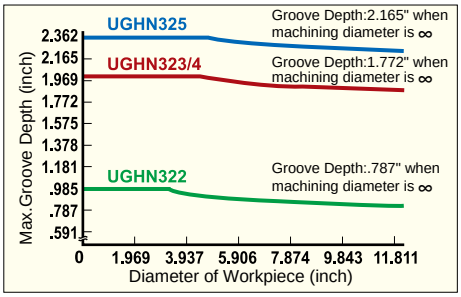
INSERTS

Order Number	Stock				Dimensions (inch)		Geometry
	Coated		Cermet				
	UE6020	US735	NX2525		CW	RE	
KGT2N	▲		●		.087 (2.2mm)	.008	
KGT**3N**	▲	●	●		.122 (3.1mm)	.008	
KGT**4N**	▲	●	●		.161 (4.1mm)	.008	
KGT**5N**	▲	●	●		.201 (5.1mm)	.008	
KGT2R	▲		●		.087 (2.2mm)	.008	
KGT**2L**	▲		●		.087 (2.2mm)	.008	
KGT**3R**	▲	●	●		.122 (3.1mm)	.008	
KGT**3L**	▲	●	●		.122 (3.1mm)	.008	
KGT**4R**	▲	●	●		.161 (4.1mm)	.008	
KGT**4L**	▲	●	●		.161 (4.1mm)	.008	
KGT**5R**	▲	●	●		.201 (5.1mm)	.008	
KGT**5L**	▲		●		.201 (5.1mm)	.008	

Left hand insert shown.

(Note) Above insert is not compatible with other manufacturer´s holders.





RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (inch/rev)			
					Groove Width .087"	Groove Width .122"	Groove Width .161"	Groove Width .201"
P	Mild Steel	≤180HB	**UE6020 ▪ NX2525**	390 (330—460)	.003 (.002—.004)	.004 (.003—.005)	.005 (.004—.006)	.005 (.004—.006)
P	Carbon Steel Alloy Steel	180—280HB	**UE6020 ▪ NX2525**	330 (260—390)	.002 (.0015—.0025)	.003 (.002—.004)	.004 (.003—.005)	.004 (.003—.005)
M	Stainless Steel	≤200HB	**US735**	260 (195—330)	.002 (.0015—.0025)	.003 (.002—.004)	.004 (.003—.005)	.004 (.003—.005)

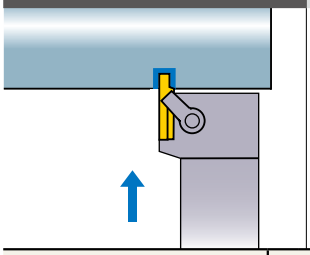
(Note) Please set cutting edge height .004 -.008inch higher than center.

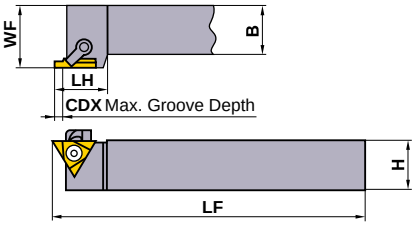
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

MTVO HOLDER

- Multi-clamp type.
- Precision class insert.
- Positive insert produces a good finished surface.
- Holder is capable of performing both grooving and threading.
- Economical due to the use of 3 cutting edges.

MTVO External grooving, Threading



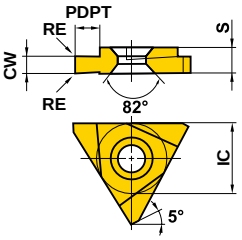


Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)								
	R	L			H	B	LF	LH	WF	CDX	Insert Screw	Clamp Screw	Clamp
MTVOR/L-8-3B	●	●	TNMC	32○	.500	.500	4.50	1.000	.750	.057 / .156	GTS1	XNS35	CL6
MTVOR/L-**10-3B**	●	●		32○	.625	.625	4.50	1.000	.875	.057 / .156	GTS1	XNS35	CL6
MTVOR/L-**12-3B**	●	●		32○	.750	.750	4.50	1.000	1.000	.057 / .156	GTS1	XNS35	CL6
MTVOR/L-**12-4B**	●	●		43○	.750	.750	4.50	1.063	1.000	.156 / .234	GTS2	XNS36	CL6
MTVOR/L-**16-4D**	●	●		43○	1.000	1.000	6.00	1.063	1.250	.156 / .234	GTS2	XNS36	CL6
MTVOR/L-**16-5D**	●	●		54○	1.000	1.000	6.00	1.250	1.250	.297	GTS3	XNS36	CL6
MTVOR/L-**20-4D**	●	●		43○	1.250	1.250	6.00	1.063	1.500	.156 / .234	GTS2	XNS36	CL6

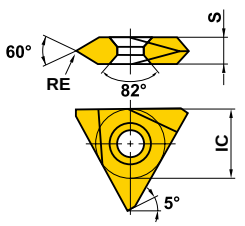
(Note) Please use right hand insert for right hand holder and left hand insert for left hand holder.

INSERTS (GROOVING)

Order Number	Class	Stock		Dimensions (inch)					Geometry
		Coated	Cermet	CW	IC	S	PDPT	RE	
		UP20M	UTi20T						
TNMC32NGR032	E	●	●	.032	.375	.125	.057	≤.003	
TNMC**32NGL032**	E	●	●	.032	.375	.125	.057	≤.003	
TNMC**32NGR063**	E	●	●	.063	.375	.125	.156	≤.003	
TNMC**32NGL063**	E	●	●	.063	.375	.125	.156	≤.003	
TNMC**43NGR063**	E	●	●	.063	.500	.188	.156	≤.003	
TNMC**43NGL063**	E	●	●	.063	.500	.188	.156	≤.003	
TNMC**43NGR094**	E	●	●	.094	.500	.188	.156	≤.003	
TNMC**43NGL094**	E	●	●	.094	.500	.188	.156	≤.003	
TNMC**43NGR125**	E	●	●	.125	.500	.188	.234	≤.003	
TNMC**43NGL125**	E	●	●	.125	.500	.188	.234	≤.003	
TNMC**43NGR156**	E	●	●	.156	.500	.188	.234	≤.003	
TNMC**43NGL156**	E	●	●	.156	.500	.188	.234	≤.003	
TNMC**54NGR187**	E	●	●	.187	.625	.250	.297	≤.003	
TNMC**54NGL187**	E	●	●	.187	.625	.250	.297	≤.003	

Right hand insert shown.

INSERTS (THREADING)

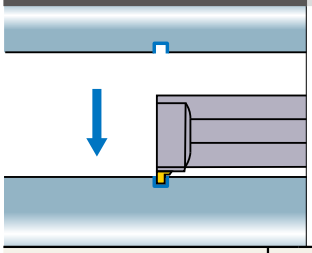
Order Number	Class	Stock		Min. Pitch (T.P.I)	Dimensions (inch)			Geometry
		Coated	Carbide		IC	S	RE	
		UP20M	UTi20T					
TNMC32NV	E	●	●	8	.375	.125	.004	
TNMC**43NV**	E	●	●	6	.500	.187	.004	
TNMC**54NV**	E	●	●	4	.625	.250	.004	

● : Inventory maintained.

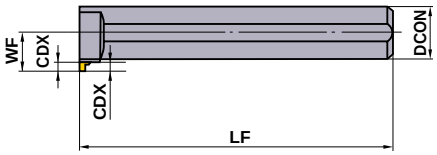
STHN/O TYPE

- Multi-clamp type.
- Precision class insert.
- Positive insert produces a good finished surface.
- Holder is capable of performing both grooving and threading.
- Economical due to the use of 3 cutting edges.

S-STHN/O Internal grooving, Threading, Boring







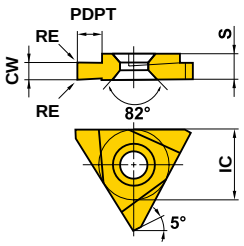
Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)							
	R	L			DCON	LF	WF	GAMF	DMIN	CDX	Clamp Screw	Wrench
S16-STHNR/L-3	●	●	TNMC	32◌	1.000	10.00	.656	10°	**1.250**	.060 / .156	GTS1	TKY10F
S20-STHNR/L-4	●	●		43◌	1.250	12.00	.843	10°	**1.750**	.156 / .234	GTS2	TKY20F
S24-STHNR/L-4	●	●		43◌	1.500	14.00	.968	10°	**2.250**	.156 / .234	GTS2	TKY20F
S32-STHNR/L-4	●	●		43◌	2.000	14.00	1.218	10°	**3.000**	.156 / .234	GTS2	TKY20F
S32-STHOR/L-5	●	●		54◌	2.000	14.00	1.250	0	**4.000**	.297	GTS3	TKY20F

(Note) Please use left hand insert for right hand holder and right hand insert for left hand holder.

INSERTS (GROOVING)

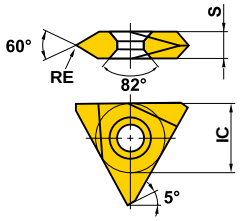
Order Number	Class	Stock		Dimensions (inch)					Geometry
		Coated	Carbide	CW	IC	S	PDPT	RE	
		UP20M	UTi20T						
TNMC32NGR032	E	●	●	.032	.375	.125	.057	≤.003	
TNMC**32NGL032**	E	●	●	.032	.375	.125	.057	≤.003	
TNMC**32NGR063**	E	●	●	.063	.375	.125	.156	≤.003	
TNMC**32NGL063**	E	●	●	.063	.375	.125	.156	≤.003	
TNMC**43NGR063**	E	●	●	.063	.500	.188	.156	≤.003	
TNMC**43NGL063**	E	●	●	.063	.500	.188	.156	≤.003	
TNMC**43NGR094**	E	●	●	.094	.500	.188	.156	≤.003	
TNMC**43NGL094**	E	●	●	.094	.500	.188	.156	≤.003	
TNMC**43NGR125**	E	●	●	.125	.500	.188	.234	≤.003	
TNMC**43NGL125**	E	●	●	.125	.500	.188	.234	≤.003	
TNMC**43NGR156**	E	●	●	.156	.500	.188	.234	≤.003	
TNMC**43NGL156**	E	●	●	.156	.500	.188	.234	≤.003	
TNMC**54NGR187**	E	●	●	.187	.625	.250	.297	≤.003	
TNMC**54NGL187**	E	●	●	.187	.625	.250	.297	≤.003	



Right hand insert shown.

INSERTS (THREADING)

Order Number	Class	Stock		Min. Pitch (T.P.I)	Dimensions (inch)			Geometry
		Coated	Carbide		IC	S	RE	
		UP20M	UTi20T					
TNMC32NV	E	●	●	8	.375	.125	.004	
TNMC**43NV**	E	●	●	6	.500	.187	.004	
TNMC**54NV**	E	●	●	4	.625	.250	.004	



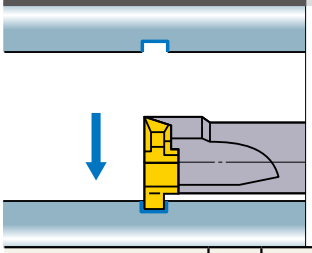
GROOVING

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

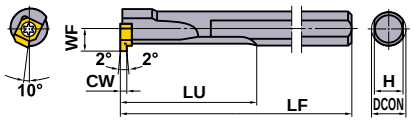
F TYPE

- Min. cutting diameter 10mm.
- Screw-on type.
- Usable for various applications.
- Max. groove depth: 3mm.

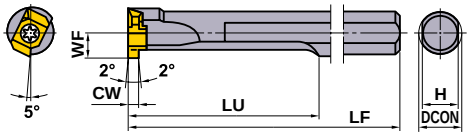
FSL51 Internal grooving, Threading



1 Corner type (FSL5108R,5110R)



2 Corner type (FSL5112R,5114R,5116R)



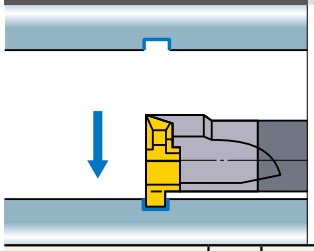
Metric Standard

Right hand tool holder only.

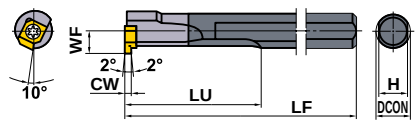
Order Number	Stock	Insert Number				Dimensions (mm)							Max. Groove Depth (mm)	Clamp Screw	Wrench
	R	Grooving		Threading		DCON	H	LF	LU	WF	CW	DMIN*			
FSL5108R	★	MLG	10◌◌L	MLT	1001L	8	7	125	30	4.8	1.2 1.5 2.0	**10**	1.0	TS25	TKY08F
FSL**5110R**	★	MLG	10◌◌L	MLT	1001L	10	9	150	40	5.8		**12**	1.0	TS25	TKY08F
FSL**5112R**	★	MLG	14◌◌L	MLT	1401L	12	10.8	180	50	6.8	1.5 2.0 3.0	**14**	2.0	TS32	TKY08F
FSL**5114R**	★	MLG	14◌◌L	MLT	1401L	14	12.4	180	60	7.8		**16**	2.0	TS32	TKY08F
FSL**5116R**	★	MLG	20◌◌L	MLT	2001L	16	14	200	70	9.7	2.0 3.0 4.0	**20**	3.0	TS43	TKY15F

★DMIN : Min. Cutting Diameter

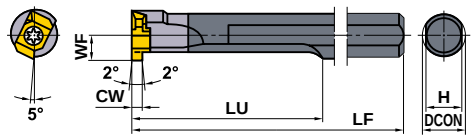
FSL52 Carbide shank



1 Corner type (FSL5208R,5210R)



2 Corner type (FSL5212R,5214R,5216R)



Metric Standard

Right hand tool holder only.

Order Number	Stock	Insert Number				Dimensions (mm)							Max. Groove Depth (mm)	Clamp Screw	Wrench
	R	Grooving		Threading		DCON	H	LF	LU	WF	CW	DMIN*			
FSL5208R	★	MLG	10◌◌L	MLT	1001L	8	7	125	60	4.8	1.2 1.5 2.0	**10**	1.0	TS25	TKY08F
FSL**5210R**	★	MLG	10◌◌L	MLT	1001L	10	9	150	70	5.8		**12**	1.0	TS25	TKY08F
FSL**5212R**	★	MLG	14◌◌L	MLT	1401L	12	10.8	180	80	6.8	1.5 2.0 3.0	**14**	2.0	TS32	TKY08F
FSL**5214R**	★	MLG	14◌◌L	MLT	1401L	14	12.4	180	85	7.8		**16**	2.0	TS32	TKY08F
FSL**5216R**	★	MLG	20◌◌L	MLT	2001L	16	14	200	115	9.7	2.0 3.0 4.0	**20**	3.0	TS43	TKY15F

★DMIN : Min. Cutting Diameter

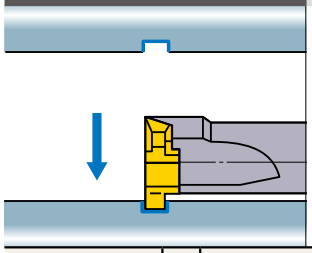
RECOMMENDED CUTTING CONDITIONS

Work Material		Hardness	Grade	Cutting Speed (SFM)	Feed (inch/rev)
P	Carbon Steel Alloy Steel	180—280HB	**UP20M ▪ UTi20T**	295 (195—390)	.002 (.0008—.003)
		280—350HB	**UP20M ▪ UTi20T**	260 (165—330)	.001 (.0008—.0015)

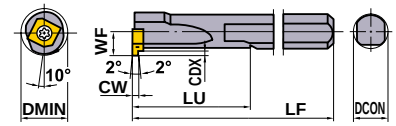
● : Inventory maintained. ★ : Inventory maintained in Japan.

S-SL5N

Internal grooving, Threading, Boring

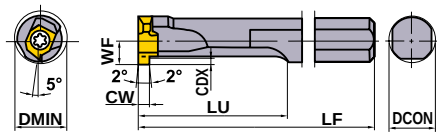


1 Corner type (S-SL5NR05 / 06)



(Min.Bore)

2 Corner type (S-SL5NR08 / 10 / 12)



(Min.Bore)

Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (inch)								
	R	Grooving	Threading	DCON	LF	LU	WF	CW	DMIN	CDX	Clamp Screw	Wrench
S-SL5NR05	●	MLG10W○○○L	MLT1001L	.313	5.000	1.250	.188	.062" 1.2mm	.390	.039	TS25	TKY08F
S-SL5NR06	●	MLG10W○○○L	MLT1001L	.375	6.000	1.500	.219	1.5mm 2.0mm	.449	.039	TS25	TKY08F
S-SL5NR08	●	MLG14W○○○L	MLT1401L	.500	7.000	2.000	.281	.062" 1.5mm 2.0mm 3.0mm	.579	.079	TS32	TKY08F
S-SL5NR10	●	MLG20W○○○L	MLT2001L	.625	8.000	3.000	.375	2.0mm 3.0mm	.791	.118	TS43	TKY15F
S-SL5NR12	●	MLG20W○○○L	MLT2001L	.750	10.000	4.000	.438	4.0mm	.902	.118	TS43	TKY15F

RECOMMENDED CUTTING CONDITIONS

Work Material		Hardness	Grade	Cutting Speed (SFM)	Feed (inch/rev)
P	Carbon Steel Alloy Steel	180—280HB	**UP20M ▪ UTi20T**	295 (195—390)	.002 (.0008—.003)
		280—350HB	**UP20M ▪ UTi20T**	260 (165—330)	.001 (.0008—.0015)

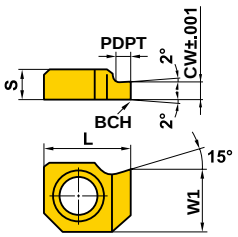
INSERTS ➤ F236
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

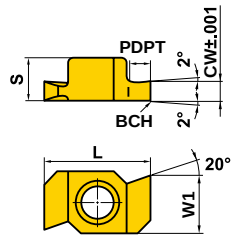
F TYPE

- Min. cutting diameter .390inch.
- Screw-on type.
- Usable for various applications.
- Max. groove depth: .118inch.

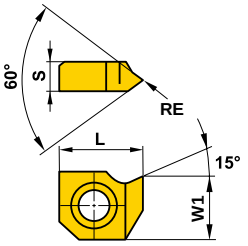
INSERTS

Application		CW (inch)	Order Number	Carbide UTi20T	Carbide HTi10	L	W1	PDPT	S	BCH	Geometry
Grooving	Inch	.062	**MLG10W062L**		●	.276	.197	.039	.094	.004	**MLG...L (1 Corner type)**
	Metric	.047 (1.2mm)	**MLG1012L**	●		.276	.197	.039	.094	.004	
		.059 (1.5mm)	**MLG1015L**	●		.276	.197	.039	.094	.004	
		.079 (2.0mm)	**MLG1020L**	●		.276	.197	.039	.094	.004	
	Metric	.059 (1.5mm)	**MLG1415L**	●		.465	.256	.079	.187	.004	**MLG...L (2 Corner type)**
		.079 (2.0mm)	**MLG1420L**	●		.465	.256	.079	.187	.004	
		.118 (3.0mm)	**MLG1430L**	●		.465	.256	.079	.187	.004	
		.079 (2.0mm)	**MLG2020L**	●		.661	.356	.118	.250	.004	
		.118 (3.0mm)	**MLG2030L**	●		.661	.356	.118	.250	.004	
		.157 (4.0mm)	**MLG2040L**	●		.661	.356	.118	.250	.004	





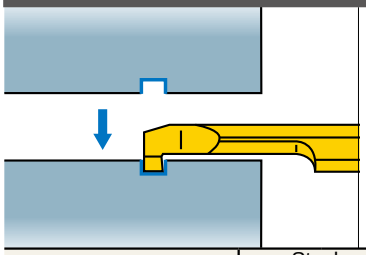
Application	Pitch	Order Number	Coated UP20M	Carbide UTi20T	L	W1	S	RE	Geometry
Threading	13T.P.I	**MLT1001L**	●	●	.276	.197	.094	.004	**MLT1001L (1 Corner type)**
	11T.P.I	**MLT1401L**	●	●	.465	.256	.187	.004	
	8T.P.I	**MLT2001L**	●	●	.661	.356	.250	.004	

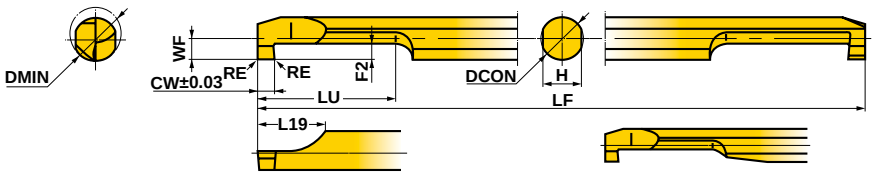


● : Inventory maintained. (1 MICRO-MINI TWIN in one case)

MICRO-MINI TWIN

CG — Internal grooving





★ Only for CG03◌◌RS-◌◌B

Order Number	Stock		Breaker	Dimensions (mm)									
	Micro Grain Carbide	Coated											
	TF15	VP15TF		DMIN	CW	F2	RE	DCON	LF	LU	L19	WF	H
CG0305RS-10	●	●	Without	3	1	1	0.05	3	50	5	6	1.3	2.7
CG0305RS-10B	●	●	With	3	1	1	0.05	3	50	5	6	1.3	2.7
CG0306RS-20	●	●	Without	3	2	1	0.1	3	50	6	6	1.3	2.7
CG0306RS-20B	●	●	With	3	2	1	0.1	3	50	6	6	1.3	2.7
CG03RS-10	●	●	Without	3	1	1	0.05	3	50	10	6	1.3	2.7
CG03RS-10B	●	●	With	3	1	1	0.05	3	50	10	6	1.3	2.7
CG03RS-20	●	●	Without	3	2	1	0.1	3	50	11	6	1.3	2.7
CG03RS-20B	●	●	With	3	2	1	0.1	3	50	11	6	1.3	2.7
CG0407RS-10	●	●	Without	4	1	1.5	0.05	4	60	7	7	1.8	3.6
CG0407RS-10B	●	●	With	4	1	1.5	0.05	4	60	7	7	1.8	3.6
CG0408RS-20	●	●	Without	4	2	1.5	0.1	4	60	8	7	1.8	3.6
CG0408RS-20B	●	●	With	4	2	1.5	0.1	4	60	8	7	1.8	3.6
CG04RS-10	●	●	Without	4	1	1.5	0.05	4	60	15	7	1.8	3.6
CG04RS-10B	●	●	With	4	1	1.5	0.05	4	60	15	7	1.8	3.6
CG04RS-20	●	●	Without	4	2	1.5	0.1	4	60	16	7	1.8	3.6
CG04RS-20B	●	●	With	4	2	1.5	0.1	4	60	16	7	1.8	3.6
CG0510RS-10	●	●	Without	5	1	2	0.05	5	70	10	8	2.3	4.5
CG0510RS-10B	●	●	With	5	1	2	0.05	5	70	10	8	2.3	4.5
CG0511RS-20	●	●	Without	5	2	2	0.1	5	70	11	8	2.3	4.5
CG0511RS-20B	●	●	With	5	2	2	0.1	5	70	11	8	2.3	4.5
CG05RS-10	●	●	Without	5	1	2	0.05	5	70	20	8	2.3	4.5
CG05RS-10B	●	●	With	5	1	2	0.05	5	70	20	8	2.3	4.5
CG05RS-20	●	●	Without	5	2	2	0.1	5	70	21	8	2.3	4.5
CG05RS-20B	●	●	With	5	2	2	0.1	5	70	21	8	2.3	4.5
CG0610RS-10	●	●	Without	6	1	2	0.05	6	75	10	8	2.8	5.4
CG0610RS-10B	●	●	With	6	1	2	0.05	6	75	10	8	2.8	5.4
CG0611RS-20	●	●	Without	6	2	2	0.1	6	75	11	8	2.8	5.4
CG0611RS-20B	●	●	With	6	2	2	0.1	6	75	11	8	2.8	5.4
CG06RS-10	●	●	Without	6	1	2	0.05	6	75	20	8	2.8	5.4
CG06RS-10B	●	●	With	6	1	2	0.05	6	75	20	8	2.8	5.4
CG06RS-20	●	●	Without	6	2	2	0.1	6	75	21	8	2.8	5.4
CG06RS-20B	●	●	With	6	2	2	0.1	6	75	21	8	2.8	5.4
CG0712RS-10	●	●	Without	7	1	2	0.05	7	85	12	8	3.3	6.4
CG0712RS-10B	●	●	With	7	1	2	0.05	7	85	12	8	3.3	6.4
CG0713RS-20	●	●	Without	7	2	2	0.1	7	85	13	8	3.3	6.4
CG0713RS-20B	●	●	With	7	2	2	0.1	7	85	13	8	3.3	6.4
CG07RS-10	●	●	Without	7	1	2	0.05	7	85	25	8	3.3	6.4
CG07RS-10B	●	●	With	7	1	2	0.05	7	85	25	8	3.3	6.4
CG07RS-20	●	●	Without	7	2	2	0.1	7	85	26	8	3.3	6.4
CG07RS-20B	●	●	With	7	2	2	0.1	7	85	26	8	3.3	6.4

HOLDER ➤ E034, E036, E037
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

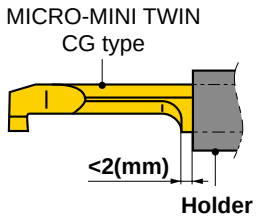
HOLDER

HOLDER CROSS REFERENCE LIST OF INCH SHANK STANDARD

Holder			MICRO-MINI TWIN	Machine Makers
Type	Order Number		CG	
Round Type Holder ϕ.625inch	ID : Metric Type	**RBH10189A**	030◌RS-◌◌(B), 03RS-◌◌(B)	Citizen Precision Machinery Co., Ltd. NC lathes
		RBH**10252A**	040◌RS-◌◌(B), 04RS-◌◌(B)	
		RBH**10315A**	051◌RS-◌◌(B), 05RS-◌◌(B)	
		RBH**10378A**	061◌RS-◌◌(B), 06RS-◌◌(B)	
		RBH**10441A**	071◌RS-◌◌(B), 07RS-◌◌(B)	
Round Type Holder ϕ.750inch	ID : Metric Type	**RBH19030N**	030◌RS-◌◌(B), 03RS-◌◌(B)	Citizen Precision Machinery Co., Ltd.
		RBH**19040N**	040◌RS-◌◌(B), 04RS-◌◌(B)	
		RBH**19050N**	051◌RS-◌◌(B), 05RS-◌◌(B)	
		RBH**19060N**	061◌RS-◌◌(B), 06RS-◌◌(B)	
		RBH**19070N**	071◌RS-◌◌(B), 07RS-◌◌(B)	
Round Type Holder ϕ1.000inch	ID : Metric Type	**RBH16189A**	030◌RS-◌◌(B), 03RS-◌◌(B)	Citizen Precision Machinery Co., Ltd. NC lathes
		RBH**16252A**	040◌RS-◌◌(B), 04RS-◌◌(B)	
		RBH**16315A**	051◌RS-◌◌(B), 05RS-◌◌(B)	
		RBH**16378A**	061◌RS-◌◌(B), 06RS-◌◌(B)	
		RBH**16441A**	071◌RS-◌◌(B), 07RS-◌◌(B)	

⁎ Mitsubishi Materials obtained the makers' approval before entering their names in the list.

RECOMMENDED TOOL OVERHANG



(Note) For LU, refer to page F237.

RECOMMENDED CUTTING CONDITIONS

Work Material		Cutting Speed (SFM)	Feed (IPR)	
			03RS/04RS	**05RS/06RS/07RS**
P	General Steel	130—395	.0004—.001	.0004—.002
M	Stainless Steel	130—395	.0004—.001	.0004—.002
K	Cast Iron	130—395	.0004—.002	.0004—.002
N	Non Ferrous Materials	260—525	.0004—.002	.0004—.003

(Note) Recommend wet machining.

HOLDER CROSS REFERENCE LIST OF METRIC SHANK STANDARD

Holder		MICRO-MINI TWIN	Machine Makers
Type	Order Number	CG	
Round Type Holder ϕ16mm	**RBH1630N**	030◌RS-◌◌(B), 03RS-◌◌(B)	MIYANO MACHINERY JAPAN INC. NC lathes
	RBH**1640N**	040◌RS-◌◌(B), 04RS-◌◌(B)	
	RBH**1650N**	051◌RS-◌◌(B), 05RS-◌◌(B)	
	RBH**1660N**	061◌RS-◌◌(B), 06RS-◌◌(B)	
	RBH**1670N**	071◌RS-◌◌(B), 07RS-◌◌(B)	
Round Type Holder ϕ20mm	**RBH2030N**	030◌RS-◌◌(B), 03RS-◌◌(B)	Citizen Precision Machinery Co., Ltd. Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	RBH**2040N**	040◌RS-◌◌(B), 04RS-◌◌(B)	
	RBH**2050N**	051◌RS-◌◌(B), 05RS-◌◌(B)	
	RBH**2060N**	061◌RS-◌◌(B), 06RS-◌◌(B)	
	RBH**2070N**	071◌RS-◌◌(B), 07RS-◌◌(B)	
Round Type Holder ϕ22mm	**RBH2230N**	030◌RS-◌◌(B), 03RS-◌◌(B)	STAR MICRONICS CO., LTD.
	RBH**2240N**	040◌RS-◌◌(B), 04RS-◌◌(B)	
	RBH**2250N**	051◌RS-◌◌(B), 05RS-◌◌(B)	
	RBH**2260N**	061◌RS-◌◌(B), 06RS-◌◌(B)	
	RBH**2270N**	071◌RS-◌◌(B), 07RS-◌◌(B)	
Round Type Holder ϕ25mm	**RBH2530N**	030◌RS-◌◌(B), 03RS-◌◌(B)	Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	RBH**2540N**	040◌RS-◌◌(B), 04RS-◌◌(B)	
	RBH**2550N**	051◌RS-◌◌(B), 05RS-◌◌(B)	
	RBH**2560N**	061◌RS-◌◌(B), 06RS-◌◌(B)	
	RBH**2570N**	071◌RS-◌◌(B), 07RS-◌◌(B)	
Square Type Holder □10mm	**SBH1030R**	030◌RS-◌◌(B), 03RS-◌◌(B)	NC lathes
	SBH**1040R**	040◌RS-◌◌(B), 04RS-◌◌(B)	
	SBH**1050R**	051◌RS-◌◌(B), 05RS-◌◌(B)	
	SBH**1060R**	061◌RS-◌◌(B), 06RS-◌◌(B)	
	SBH**1070R**	071◌RS-◌◌(B), 07RS-◌◌(B)	

* Mitsubishi Materials obtained the makers' approval before entering their names in the list.

HOLDER ➤ E034, E036, E037
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

GUIDE TO THREADING TOOLS

●Section organization

①Classified according to external or internal applications.
②Sub-classified according to product series.
(Refer to the index on the next page.)

FIGURE SHOWING THE TOOLING APPLICATION
uses illustrations and arrows to depict the available machining applications, such as external and internal threading.

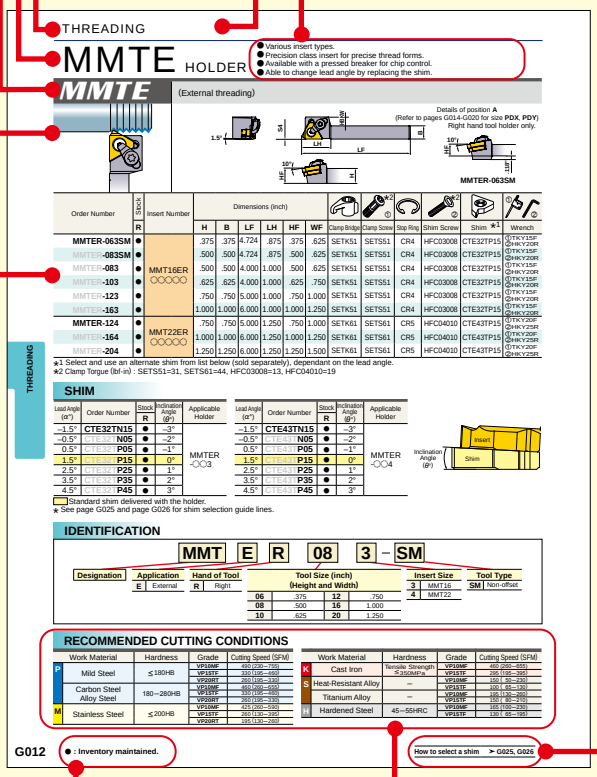
TYPE OF TOOL HOLDER
indicates the initial letters for the order number and cutting applications.

TITLE OF PRODUCT

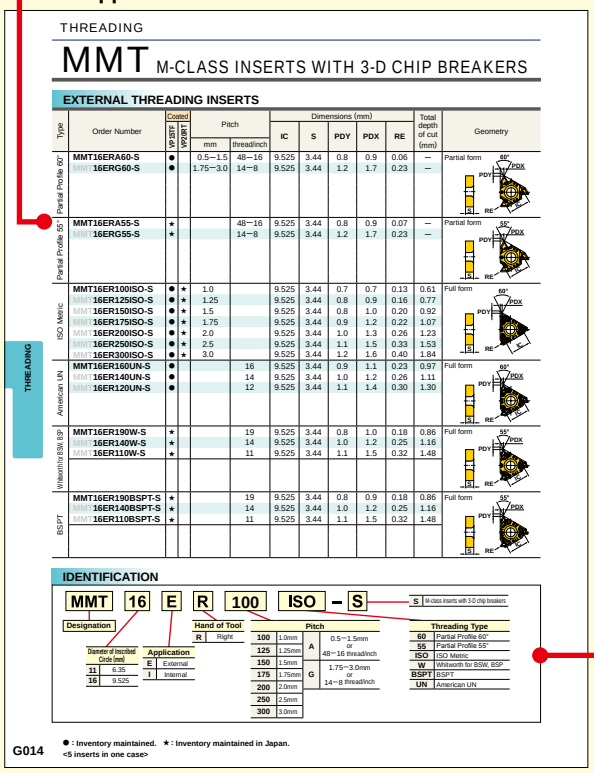
INDICATION OF EXTERNAL /INTERNAL APPLICATION

PRODUCT SECTION

PRODUCT FEATURES



STANDARDS FOR APPLICABLE INSERTS
indicates stock status, dimensions, etc. for applicable inserts.



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), applicable inserts, holder dimensions, and spare parts.

PAGE REFERENCE
·INSERTS
·SPARE PARTS
·TECHNICAL DATA

IDENTIFICATION FOR INSERTS

RECOMMENDED CUTTING CONDITIONS
for each work material classification, indicates recommended cutting conditions according to the ISO categories for cutting grades, P, M, K, N, S and H.

●To Order : For holder, please specify order number and hand of tool (right/left).
For insert, please specify insert number and grade.

TURNING TOOLS

THREADING

CLASSIFICATION (EXTERNAL) G002
CLASSIFICATION (INTERNAL) G003
CROSS REFERENCE THREAD PITCH
- EXTERNAL G004
- INTERNAL G006

STANDARD THREAD AND CORRESPONDING INSERT G008
PIPE THREADS AND TOOL SELECTION G009
FEATURES OF MMT SERIES G010

STANDARD OF THREADING TOOLS

EXTERNAL THREADING
- MMTE HOLDER G012
- MTVO HOLDER G034

INTERNAL THREADING
- MMTI TYPE BORING BARS G013
- STHN/O TYPE BORING BARS G035
- FSL5 TYPE BORING BARS G036
- SL5N TYPE BORING BARS G037
- MICRO-MINI TWIN(CT) BORING BARS G039

THREADING METHODS G022
STANDARD OF DEPTH OF CUT G027
TROUBLE SHOOTING G033

*Arranged by Alphabetical order

G039 **CT**
G036 **FSL51**
G036 **FSL52**
G038 **MLG (INSERTS)**
G038 **MLT (INSERTS)**
G014 **MMT (INSERTS)**
G012 **MMTE**
G013 **MMTI**
G034 **MTVO**
G037 **S-SL5N**
G035 **S-STHN/O**
G034 **TNMC (INSERTS)**

CLASSIFICATION

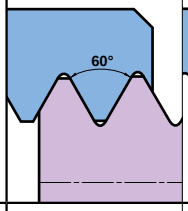
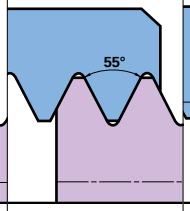
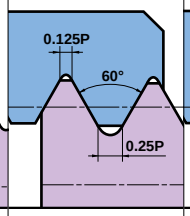
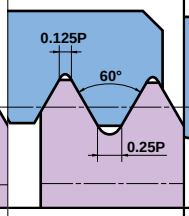
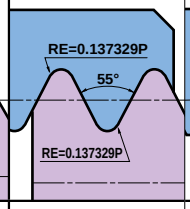
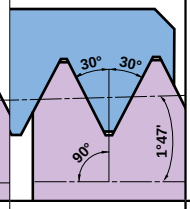
EXTERNAL CUTTING

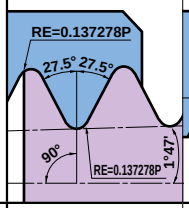
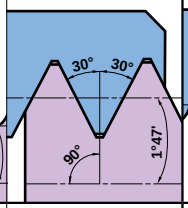
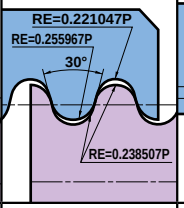
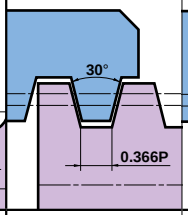
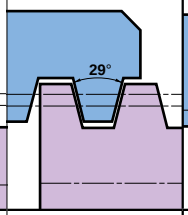
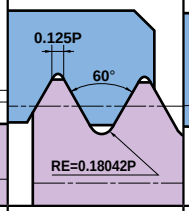
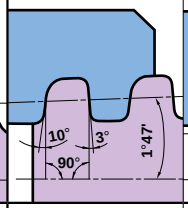
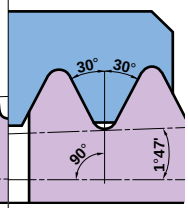
Name of Tool Holder	Insert Shape	Features
MMTE Holder  G012		● Various insert types. ● Precision class insert for precise thread forms. ● Available with a pressed breaker for chip control. ● Able to change lead angle by replacing the shim.
MTVO Holder  G034		● Multi-clamp type. ● Precision class insert. ● Positive insert produces a good finished surface. ● Holder is capable of performing both grooving and threading. ● Economical due to the use of 3 cutting edges.

INTERNAL CUTTING

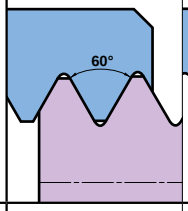
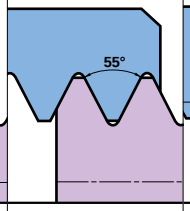
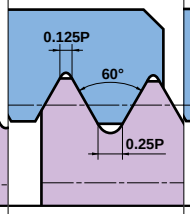
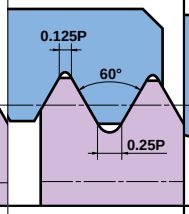
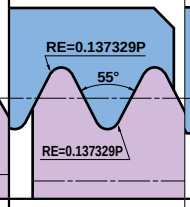
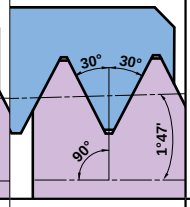
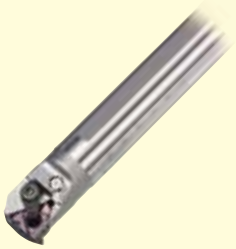
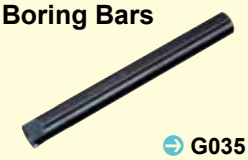
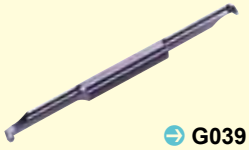
Name of Tool Holder	Insert Shape	Features
MMTI  G013		● Minimum cutting diameter .500 inch. ● Various insert types. ● Precision class insert for precise thread forms. ● Available with a pressed breaker for chip control. ● Able to change lead angle by replacing the shim.
STHN/O  G035		● Screw-on type. ● Precision class insert. ● Positive insert produces a good finished surface. ● Holder is capable of performing both grooving and threading. ● Economical due to the use of 3 cutting edges.
FSLS **S-SLS**  G036 G037		● Screw-on type. ● Precision class insert. ● Holder is capable of performing both grooving and threading. ● Maximum groove depth .118inch.
MICRO-MINI TWIN Boring Bars  G039	–	● Solid carbide type. ● Economical due to single holder with two cutting edges.
MICRO-MINI Boring Bars  E031	–	● Solid carbide type. ● Insert can be ground to suit the application.

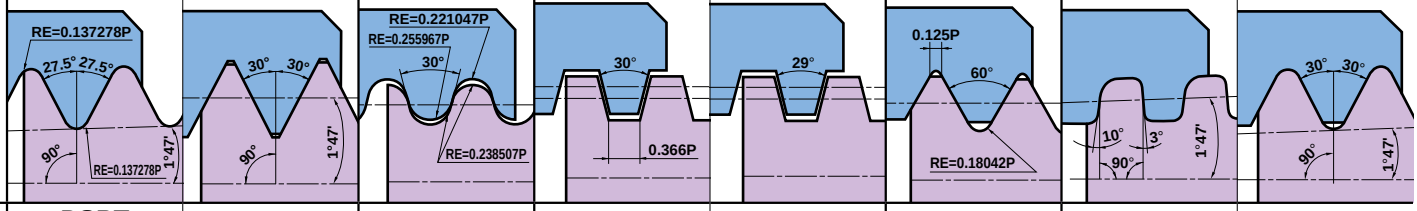
CROSS REFERENCE THREAD PITCH

Application		General machining				Pipe fittings and couplings for gas and water	
Type		Partial Profile 60°	Partial Profile 55°	ISO Metric	American UN	Parallel Pipe Thread Whitworth for BSW, BSP	American NPT
							
Symbol		M UNC UNF	W	M	UNC UNF	G(PF) W	NPT
Holder	Pitch	mm (thread/inch)	thread/inch	mm	thread/inch	thread/inch	thread/inch
MMT Holder  G012	Full form	–	–	0.5 2.5 0.75 3.0 1.0 3.5 1.25 4.0 1.5 4.5 1.75 5.0 2.0	32 12 28 11 24 10 20 9 18 8 16 7 14 6 13 5	28 11 26 10 20 9 19 8 18 7 16 6 14 5 12	27 18 14 11.5 8
		–	–	G014, G016	G014, G018	G014, G018	G020
	Partial form	0.5 –1.5(48–16) 1.75–3.0(14– 8) 0.5 –3.0(48– 8) 3.5 –5.0(07– 5)	48–16 14– 8 48– 8 7– 5	0.5 –1.5 1.75–3.0 0.5 –3.0 3.5 –5.0	48–16 14– 8 48– 8 7– 5	–	–
		G014, G016	G014, G016	G016	G016		
MTVO Holder  G034	Partial form	0.5–3.0 0.5–4.5 0.5–6.0	–	0.5–3.0 0.5–4.5 0.5–6.0	48–8 48–6 48–4	–	–
		G034		G034	G034		

	Steam, gas and water pipes		Pipe couplings for food and fire fighting industries	Motion transmission		Aircraft and aerospace	Oil and gas	
	Taper Pipe Thread BSPT	American NPTF	Round DIN 405	ISO Trapezoidal 30°	American ACME	UNJ	API Buttress Casing	API Round Casing & Tubing
								
	BSPT R(PT) Rc(PS) Rp	NPTF	Rd	Tr (TM)	ACME (Tw)	UNJ	BCSG	CSG LCSG
	thread/inch	thread/inch	thread/inch	mm	thread/inch	thread/inch	thread/inch	thread/inch
	28 19 14 11	27 18 14 11.5 8	10 8 6 4	1.5 2.0 3.0 4.0 5.0	12 10 8 6 5	32 16 28 14 24 12 20 10 18 8	5	10 8
	G014, G018	G020	G018	G020	G020	G020	G020	G020
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–

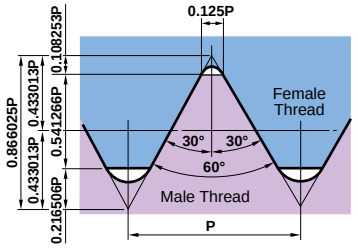
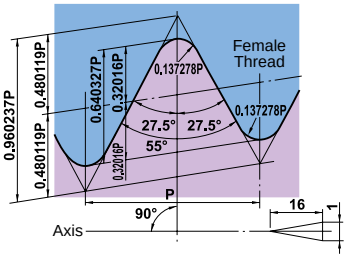
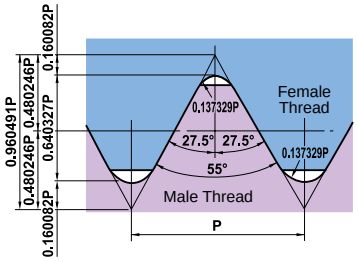
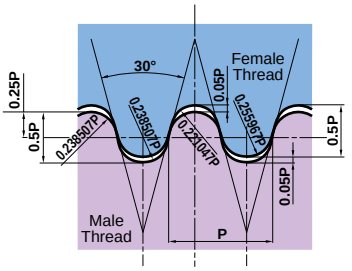
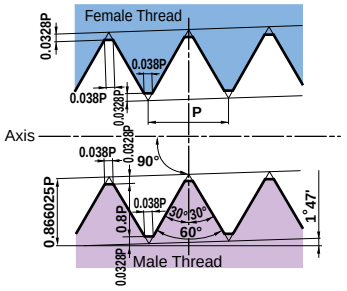
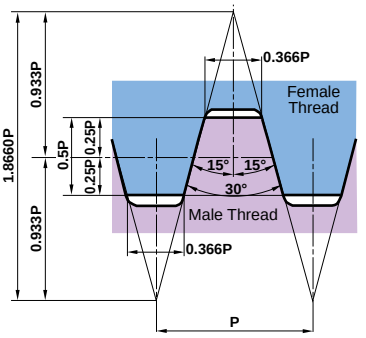
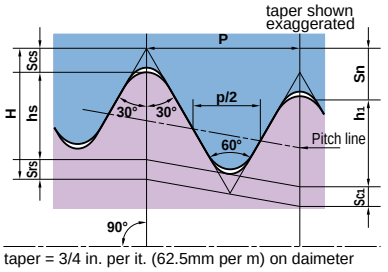
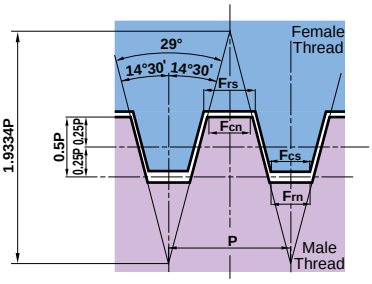
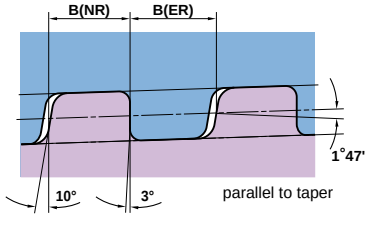
CROSS REFERENCE THREAD PITCH

Application		General machining				Pipe fittings and couplings for gas and water	
Type		Partial Profile 60°	Partial Profile 55°	ISO Metric	American UN	Parallel Pipe Thread Whitworth for BSW, BSP	American NPT
							
Symbol		M UNC UNF	W	M	UNC UNF	G(PF) W	NPT
Holder	Pitch	mm (thread/inch)	thread/inch	mm	thread/inch	thread/inch	thread/inch
MMT Boring Bars  G013	Full form	–	–	0.5 2.5 0.75 3.0 1.0 3.5 1.25 4.0 1.5 4.5 1.75 5.0 2.0	32 12 28 11 24 10 20 9 18 8 16 7 14 6 13 5	28 11 26 10 20 9 19 8 18 7 16 6 14 5 12	27 18 14 11.5 8
		–	–	G015, G017	G015, G019	G015, G019	G021
	Partial form	0.5 –1.5(48–16) 1.75–3.0(14– 8) 0.5 –3.0(48– 8) 3.5 –5.0(07– 5)	48–16 14– 8 48– 8 7– 5	0.5 –1.5 1.75–3.0 0.5 –3.0 3.5 –5.0	48–16 14– 8 48– 8 7– 5	–	–
		G015, G017	G015, G017	G017	G017		
STHN/O Boring Bars  G035	Partial form	0.5–3.0 0.5–4.5 0.5–6.0	–	0.5–3.0 0.5–4.5 0.5–6.0	48–8 48–6 48–4	–	–
		G035		G035	G035		
FSL5 SL5N Boring Bars  G036 G037	Partial form	1.5–2.0 1.5–2.5 1.5–3.5	–	1.5–2.0 1.5–2.5 1.5–3.5	48–13 48–11 48– 8	–	–
		G038		G038	G038		
MICRO-MINI TWIN  G039	Partial form	0.5 –1.0 (36–24) 0.75–1.25(28–20) 0.75–1.5 (24–18) 0.75–1.75(24–16)	–	0.5 -1.0 0.75-1.25 0.75-1.5 0.75-1.75	36–24 28–20 24–18 24–16		
		G039		G039	G039		

	Steam, gas and water pipes		Pipe couplings for food and fire fighting industries	Motion transmission		Aircraft and aerospace	Oil and gas	
	Taper Pipe Thread BSPT	American NPTF	Round DIN 405	ISO Trapezoidal 30°	American ACME	UNJ	API Buttress Casing	API Round Casing & Tubing
							
	BSPT R(PT) Rc(PS) Rp	NPTF	Rd	Tr (TM)	ACME (Tw)	UNJ	BCSG	CSG LCSG
	thread/inch	thread/inch	thread/inch	mm	thread/inch	thread/inch	thread/inch	thread/inch
	19 14 11 G015, G019	14 11.5 8 G021	10 8 6 4 G019	1.5 2.0 3.0 4.0 5.0 G021	12 10 8 6 5 G021	* – –	5 G021	10 8 G021
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–

* When machining an internal UNJ thread, cut an internal hole with the appropriate diameter. Then machine with 60° American UN. In this case, a full form type insert cannot be used.

STANDARD THREAD AND CORRESPONDING INSERT

Thread Name	Standard Thread Type	Symbol	Thread Name	Standard Thread Type	Symbol
ISO Metric / American UN		M UNC UNF	BSPT		BSPT R (PT) Rc (PS) Rp
Parallel Pipe Thread Whitworth for BSW, BSP		W G (PF)	Round DIN405		Rd
American NPT		NPT	ISO Trapezoidal 30°		Tr (TM)
API Round Casing & Tubing		CSG LCSG	American ACME		ACME (Tw)
API Buttress Casing		BCSG			

PIPE THREADS AND TOOL SELECTION

Parallel Pipe Threads G(PF)

Thread Type	Number of threads	Standard internal diameter
G1/16	28	.258"
G1/8		.337"
G1/4	19	.451"
G3/8		.589"
G1/2	14	.734"
G5/8		.811"
G3/4		.949"
G7/8		1.098"
G1	11	1.193"
G1·1/8		1.376"
G1·1/4		1.534"

Note) Same as PF.

Taper Pipe Threads R(PT), Rc(PS)

Thread Type	Number of threads	Standard internal diameter
R1/16	28	.258"
R1/8		.337"
R1/4	19	.451"
R3/8		.589"
R1/2	14	.734"
–	–	–
R3/4	14	.949"
–	–	–
R1	11	1.193"
–	–	–
R1·1/4	11	1.534"

Note) Same as Rc and PT.

・The pitch is pre-determined for each nominal diameter. Note the minimum machining diameter especially when internal threading.

FEATURES OF MMT SERIES

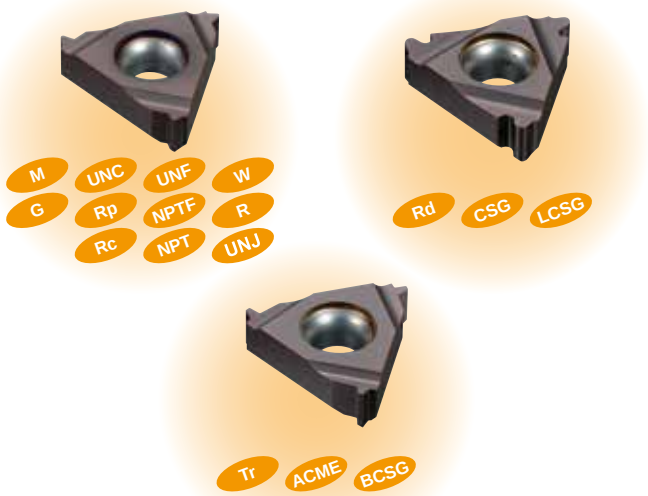
A WIDE VARIETY OF CHOICES

Mitsubishi Miracle Threading (MMT) series contains 297 inserts and 23 holders.

M-CLASS INSERTS WITH 3-D CHIP BREAKERS



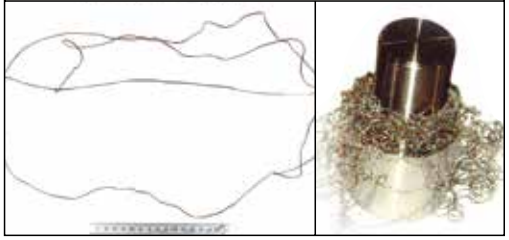
G-CLASS GROUND INSERTS



IDEAL CHIP CONTROL EVEN IN THE LATTER HALF OF PASSES WHEN CONTINUOUS CHIPS ARE USUALLY PRODUCED. (M-CLASS INSERTS WITH 3-D CHIP BREAKERS)

ISO metric external thread pitch 1.5mm Final pass (6th pass)

Competitor

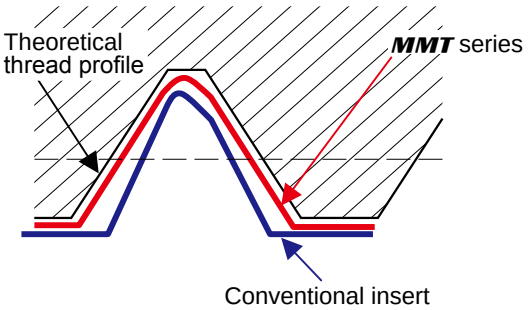


MMT



<Cutting Conditions>
Workpiece : AISI 4140
Insert : MMT16ER150ISO-S
Grade : VP15TF
Cutting speed : 395SFM
Cutting method : Radial Infeed
Depth of cut : Fixed cut area
Pass : 6 times
Coolant : Wet

A HIGHER LEVEL OF PRECISION THAN CONVENTIONAL INSERTS (G-CLASS GROUND INSERTS)

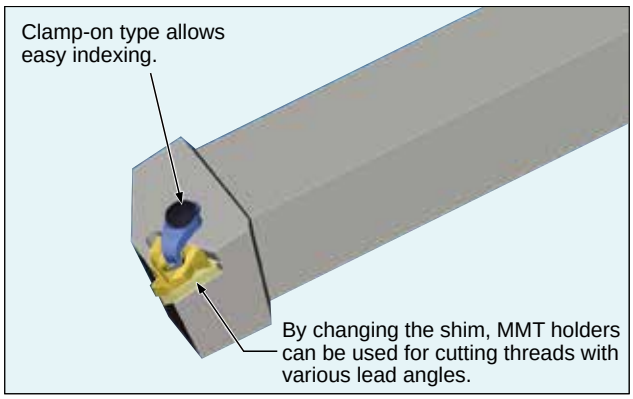


High precision threading can be achieved by using MMT inserts that feature a ground rake face and peripheral cutting edge.

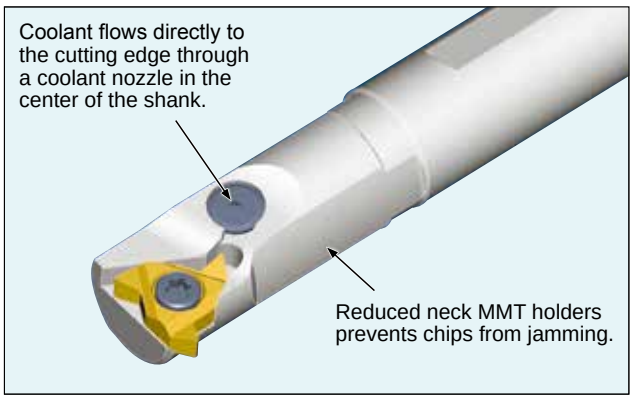
Thread Type	Threading Tolerance
ISO Metric	6g / 6H
American UN	2A / 2B
Whitworth for BSW, BSP	Medium Class A
BSPT	Standard BSPT
Round DIN 405	7h / 7H
ISO Trapezoidal 30°	7e / 7H
American ACME	3G
UNJ	3A
API Buttress Casing	Standard API
API Rounded Casing & Tubing	Standard API RD
American NPT	Standard NPT
American NPTF	Class2

HOLDER (With special surface treatment)

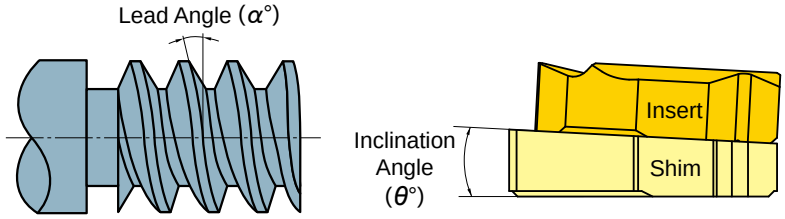
External



Internal



SUITABLE FOR THREADING WITH A LARGE LEAD ANGLE



By changing only the shim, MMT holders can be used for turning of threads with various lead angles as well as the turning of left hand threads.
(Please refer to page G022, page G025 and page G026)

Lead Angle (α°)	Inclination Angle (θ°)
−1.5°	−3°
−0.5°	−2°
0.5°	−1°
1.5°	0°
2.5°	1°
3.5°	2°
4.5°	3°

Delivered with the holder.

VP10MF (G-class ground inserts only)

- **Superior wear and plastic deformation resistance**
- **Suitable for continuous high precision machining with extensive tool life.**

• High wear and plastic deformation resistance for threading when maintaining the thread form is important.
• Effective in combination with G-class inserts for high precision threading.

VP15TF (G-class ground inserts, M-class inserts with 3-D chip breakers)

- **Wide versatility**
- **Able to withstand harsh conditions for long periods where conventional inserts would be liable to breakage.**

• High fracture resistance during low rigidity applications such as bar feed machining.
• Effective combination of high cost performance M-class inserts with 3-D chip breakers.

VP20RT (M-class inserts with 3-D chip breakers)

- **Excellent fracture resistance**

• Suitable for stainless steel boring and unstable machining where inserts are vulnerable to fracturing.
• Effective combination of high cost performance M-class inserts with 3-D chip breakers.

CHOOSING M-CLASS INSERTS WITH 3-D CHIP BREAKERS OR G-CLASS INSERTS

Insert	Chip control	Precise Threads
M-class inserts with 3-D chip breakers 	◎	○

Insert	Chip control	Precise Threads
G-class inserts 	○	◎

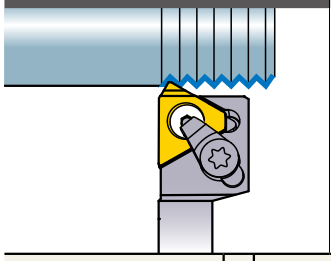
◎ : 1st recommendation
○ : 2nd recommendation

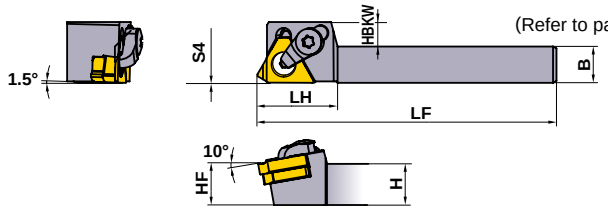
- For ideal chip control and a high cost performance ratio, M-class inserts with 3-D chip breakers are recommended.
- G-class inserts are recommended where highest precision is required.

MMTE HOLDER

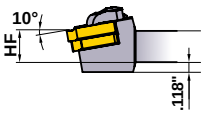
- Various insert types.
- Precision class insert for precise thread forms.
- Available with a pressed breaker for chip control.
- Able to change lead angle by replacing the shim.

MMTE (External threading)





Details of position **A**
(Refer to pages G014-G020 for size **PDX**, **PDY**)
Right hand tool holder only.



MMTER-063SM

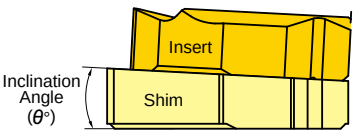
Order Number	Stock	Insert Number	Dimensions (inch)						Clamp Bridge	Clamp Screw ✶2 ①	Stop Ring	Shim Screw ✶2 ②	Shim ✶1	Wrench ① ②
	R		H	B	LF	LH	HF	WF						
MMTER-063SM	●	MMT16ER ○○○○○	.375	.375	4.724	.875	.375	.625	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER**-083SM**	●		.500	.500	4.724	.875	.500	.625	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER**-083**	●		.500	.500	4.000	1.000	.500	.625	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER**-103**	●		.625	.625	4.000	1.000	.625	.750	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER**-123**	●		.750	.750	5.000	1.000	.750	1.000	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER**-163**	●		1.000	1.000	6.000	1.000	1.000	1.250	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER-124	●	MMT22ER ○○○○○	.750	.750	5.000	1.250	.750	1.000	SETK61	SETS61	CR5	HFC04010	CTE43TP15	①TKY20F ②HKY25R
MMTER**-164**	●		1.000	1.000	6.000	1.250	1.000	1.250	SETK61	SETS61	CR5	HFC04010	CTE43TP15	①TKY20F ②HKY25R
MMTER**-204**	●		1.250	1.250	6.000	1.250	1.250	1.500	SETK61	SETS61	CR5	HFC04010	CTE43TP15	①TKY20F ②HKY25R

✶1 Select and use an alternate shim from list below (sold separately), dependant on the lead angle.
✶2 Clamp Torgue (lbf-in) : SETS51=31, SETS61=44, HFC03008=13, HFC04010=19

SHIM

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
–1.5°	**CTE32TN15**	●	–3°	MMTER -○○3
–0.5°	CTE32T**N05**	●	–2°	
0.5°	CTE32T**P05**	●	–1°	
1.5°	CTE32T**P15**	●	0°	
2.5°	CTE32T**P25**	●	1°	
3.5°	CTE32T**P35**	●	2°	
4.5°	CTE32T**P45**	●	3°	

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
–1.5°	**CTE43TN15**	●	–3°	MMTER -○○4
–0.5°	CTE43T**N05**	●	–2°	
0.5°	CTE43T**P05**	●	–1°	
1.5°	CTE43T**P15**	●	0°	
2.5°	CTE43T**P25**	●	1°	
3.5°	CTE43T**P35**	●	2°	
4.5°	CTE43T**P45**	●	3°	



Standard shim delivered with the holder.
✶ See page G025 and page G026 for shim selection guide lines.

IDENTIFICATION

MMT E R 08 3 – SM

Designation	Application	Hand of Tool	Tool Size (inch) (Height and Width)				Insert Size		Tool Type	
	E External	R Right	06	.375	12	.750	3	MMT16	SM	Non-offset
			08	.500	16	1.000	4	MMT22		
			10	.625	20	1.250				

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	VP10MF	490 (230–755)
			VP15TF	330 (195–460)
			VP20RT	260 (195–330)
	Carbon Steel Alloy Steel	180–280HB	VP10MF	460 (260–655)
			VP15TF	330 (195–460)
			VP20RT	260 (195–330)
M	Stainless Steel	≤200HB	VP10MF	425 (260–590)
			VP15TF	260 (130–395)
			VP20RT	195 (130–260)

	Work Material	Hardness	Grade	Cutting Speed (SFM)
K	Cast Iron	Tensile Strength ≤350MPa	VP10MF	460 (260–655)
			VP15TF	295 (195–395)
S	Heat-Resistant Alloy	–	VP10MF	150 (50–230)
			VP15TF	100 (65–130)
	Titanium Alloy	–	VP10MF	195 (130–260)
			VP15TF	150 (80–210)
H	Hardened Steel	45–55HRC	VP10MF	165 (100–230)
			VP15TF	130 (65–195)

● : Inventory maintained.

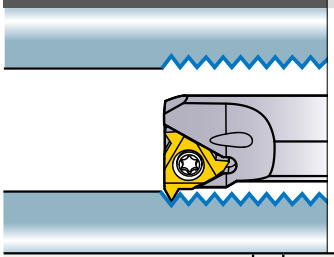
How to select a shim ➤ G025, G026

MMTI TYPE BORING BARS

- Minimum cutting diameter .500".
- Various insert types.
- Precision class insert for precise thread forms.
- Available with a pressed breaker for chip control.
- Able to change lead angle by replacing the shim.

MMTI

(Internal threading)



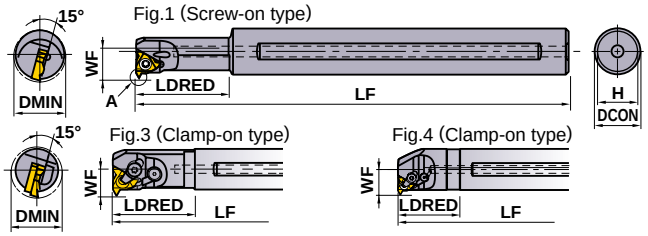


Fig.1 (Screw-on type)

Fig.2 (Screw-on type)

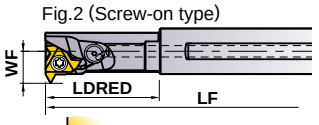
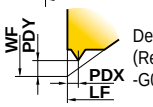


Fig.3 (Clamp-on type)

Fig.4 (Clamp-on type)



Details of position **A** (Refer to pages G015 -G021 for size **PDX**, **PDY**)

Right hand tool holder only.

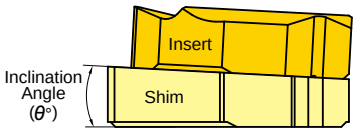
Order Number	Stock R	Insert Number	Lead Angle	Dimensions (inch) DCON	LF	LDRED	WF	H	DMIN	Clamp Bridge	Clamp Screw ①*2	Stop Ring	Shim Screw ②*2	Shim *1	Wrench ① ②	Fig.
MMTIR102-0.50-1.5-C	●	MMT11IR ○○○○○	1.5°	.625	5.000	1.000	.340	.586	**.500**	–	TS25	–	–	–	①TKY08F	1
MMTIR**102-0.50-2.5-C**	●		2.5°	.625	5.000	1.000	.340	.586	**.500**	–	TS25	–	–	–	①TKY08F	1
MMTIR**102-0.60-1.5-C**	●		1.5°	.625	6.000	1.250	.380	.586	**.600**	–	TS25	–	–	–	①TKY08F	1
MMTIR**102-0.60-2.5-C**	●		2.5°	.625	6.000	1.250	.380	.586	**.600**	–	TS25	–	–	–	①TKY08F	1
MMTIR103-0.75-1.5-C	●	MMT16IR ○○○○○	1.5°	.625	6.000	1.500	.480	.586	**.750**	–	CS350860T	–	–	–	①TKY15F	2
MMTIR**103-0.75-2.5-C**	●		2.5°	.625	6.000	1.500	.480	.586	**.750**	–	CS350860T	–	–	–	①TKY15F	2
MMTIR**123-0.90-1.5-C**	●		1.5°	.750	7.000	1.500	.510	.711	**.900**	SETK51	SETS51	CR4	HFC03006	CTI32TP15	①TKY15F ②HKY20R	3
MMTIR**163-1.15-1.5-C**	●		1.5°	1.000	10.000	2.500	.660	.937	**1.150**	SETK51	SETS51	CR4	HFC03006	CTI32TP15	①TKY15F ②HKY20R	3
MMTIR**203-1.45-1.5-C**	●		1.5°	1.250	10.000	2.000	.810	1.187	**1.450**	SETK51	SETS51	CR4	HFC03006	CTI32TP15	①TKY15F ②HKY20R	4
MMTIR124-0.95-1.5-C	●	MMT22IR ○○○○○	1.5°	.750	7.000	2.000	.610	.711	**.950**	–	TS43	–	–	–	①TKY15F	2
MMTIR**124-0.95-2.5-C**	●		2.5°	.750	7.000	2.000	.610	.711	**.950**	–	TS43	–	–	–	①TKY15F	2
MMTIR**164-1.20-1.5-C**	●		1.5°	1.000	8.000	1.500	.700	.937	**1.200**	SETK61	SETS61	CR5	HFC04008	CTI43TP15	①TKY20F ②HKY25R	4
MMTIR**204-1.50-1.5-C**	●		1.5°	1.250	10.000	2.000	.860	1.187	**1.500**	SETK61	SETS61	CR5	HFC04008	CTI43TP15	①TKY20F ②HKY25R	4
MMTIR**244-1.75-1.5-C**	●		1.5°	1.500	12.000	2.500	.980	1.437	**1.750**	SETK61	SETS61	CR5	HFC04008	CTI43TP15	①TKY20F ②HKY25R	4

*1 Select and use an alternate shim from list below (sold separately), dependant on the lead angle.
*2 Clamp Torgue (lbf-in) : TS25=8.9, CS350860T=31, SETS51=31, TS43=31, SETS61=44, HFC03006=13, HFC04008=19
Note 1) The screw-on type has no shim. The holder has an in-built lead angle. Please select a holder with the appropriate lead angle.
Note 2) The minimum cutting diameter (DMIN) indicates the prepared hole diameter, not the nominal thread diameter.

SHIM

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
–1.5°	**CTI32TN15**	●	–3°	MMTIR ○○3-○○○ -○○-C
–0.5°	CTI32T**N05**	●	–2°	
0.5°	CTI32T**P05**	●	–1°	
1.5°	CTI32T**P15**	●	0°	
2.5°	CTI32T**P25**	●	1°	
3.5°	CTI32T**P35**	●	2°	
4.5°	CTI32T**P45**	●	3°	

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
–1.5°	**CTI43TN15**	●	–3°	MMTIR ○○4-○○○ -○○-C
–0.5°	CTI43T**N05**	●	–2°	
0.5°	CTI43T**P05**	●	–1°	
1.5°	CTI43T**P15**	●	0°	
2.5°	CTI43T**P25**	●	1°	
3.5°	CTI43T**P35**	●	2°	
4.5°	CTI43T**P45**	●	3°	



Standard shim delivered with the holder.
* See page G025 and page G026 for shim selection guide lines.

IDENTIFICATION

MMT I R 10 2 – 0.50 – 1.5 – C

Designation	Application	Hand of Tool	Shank Diameter (inch)	Insert Size	Min. Cutting Diameter (inch)	Lead Angle	Coolant
MMT	I Internal	R Right	10 .625 12 .750 16 1.000 20 1.250 24 1.500	2 MMT11 3 MMT16 4 MMT22	0.50 .500 1.15 1.150 0.60 .600 1.20 1.200 0.75 .750 1.45 1.450 0.90 .900 1.50 1.500 0.95 .950 1.75 1.750	1.5 1.5° 2.5 2.5°	C With

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	VP10MF	490 (230–755)
			VP15TF	330 (195–460)
			VP20RT	260 (195–330)
	Carbon Steel Alloy Steel	180–280HB	VP10MF	460 (260–655)
			VP15TF	330 (195–460)
			VP20RT	260 (195–330)
M	Stainless Steel	≤200HB	VP10MF	425 (260–590)
			VP15TF	260 (130–395)
			VP20RT	195 (130–260)

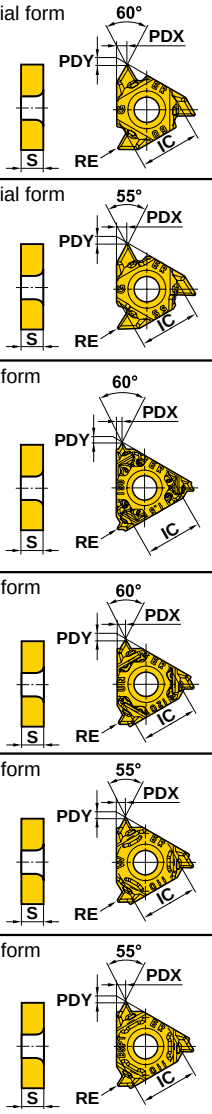
	Work Material	Hardness	Grade	Cutting Speed (SFM)
K	Cast Iron	Tensile Strength ≤350MPa	VP10MF	460 (260–655)
			VP15TF	295 (195–395)
S	Heat-Resistant Alloy	–	VP10MF	150 (50–230)
			VP15TF	100 (65–130)
	Titanium Alloy	–	VP10MF	195 (130–260)
			VP15TF	150 (80–210)
H	Hardened Steel	45–55HRC	VP10MF	165 (100–230)
			VP15TF	130 (65–195)

THREADING

MMT M-CLASS INSERTS WITH 3-D CHIP BREAKERS

EXTERNAL THREADING INSERTS

Type	Order Number	Coated VP15TF	Coated VP20RT	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
Partial Profile 60°	**MMT16ERA60-S**	●		0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.06	—	Partial form
	MMT16ERG60-S	●		1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.23	—	
Partial Profile 55°	**MMT16ERA55-S**	★			48—16	9.525	3.44	0.8	0.9	0.07	—	Partial form
	MMT16ERG55-S	★			14—8	9.525	3.44	1.2	1.7	0.23	—	
ISO Metric	**MMT16ER100ISO-S**	●	★	1.0		9.525	3.44	0.7	0.7	0.13	0.61	Full form
	MMT16ER125ISO-S	●	★	1.25		9.525	3.44	0.8	0.9	0.16	0.77	
	MMT16ER150ISO-S	●	★	1.5		9.525	3.44	0.8	1.0	0.20	0.92	
	MMT16ER175ISO-S	●	★	1.75		9.525	3.44	0.9	1.2	0.22	1.07	
	MMT16ER200ISO-S	●	★	2.0		9.525	3.44	1.0	1.3	0.26	1.23	
	MMT16ER250ISO-S	●	★	2.5		9.525	3.44	1.1	1.5	0.33	1.53	
	MMT16ER300ISO-S	●	★	3.0		9.525	3.44	1.2	1.6	0.40	1.84	
American UN	**MMT16ER160UN-S**	●			16	9.525	3.44	0.9	1.1	0.23	0.97	Full form
	MMT16ER140UN-S	●			14	9.525	3.44	1.0	1.2	0.26	1.11	
	MMT16ER120UN-S	●			12	9.525	3.44	1.1	1.4	0.30	1.30	
Whitworth for BSW, BSP	**MMT16ER190W-S**	★			19	9.525	3.44	0.8	1.0	0.18	0.86	Full form
	MMT16ER140W-S	★			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16ER110W-S	★			11	9.525	3.44	1.1	1.5	0.32	1.48	
BSPT	**MMT16ER190BSPT-S**	★			19	9.525	3.44	0.8	0.9	0.18	0.86	Full form
	MMT16ER140BSPT-S	★			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16ER110BSPT-S	★			11	9.525	3.44	1.1	1.5	0.32	1.48	



IDENTIFICATION

MMT **16** **E** **R** **100** **ISO** – **S**

Designation: MMT

Diameter of Inscribed Circle (mm)	
11	6.35
16	9.525

Application	
E	External
I	Internal

Hand of Tool	
R	Right

Pitch			
100	1.0mm	**A**	0.5—1.5mm or 48—16 thread/inch
125	1.25mm		
150	1.5mm	**G**	1.75—3.0mm or 14—8 thread/inch
175	1.75mm		
200	2.0mm		
250	2.5mm		
300	3.0mm		

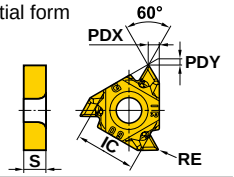
Threading Type	
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN

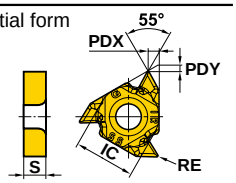
S	M-class inserts with 3-D chip breakers

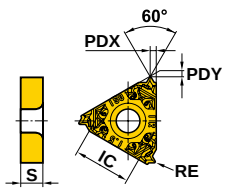
● : Inventory maintained. ★ : Inventory maintained in Japan.
<5 inserts in one case>

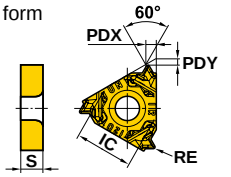
INTERNAL THREADING INSERTS

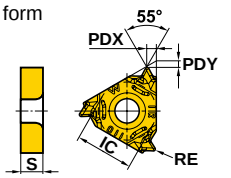
Type	Order Number	Coated VP15TF	Coated VP20RT	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
Partial Profile 60°	**MMT11IRA60-S**	★		0.5—1.5	48—16	6.35	3.04	0.8	0.9	0.03	—	Partial form
	MMT**16IRA60-S**	●		0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.03	—	
	MMT**16IRG60-S**	●		1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.11	—	
Partial Profile 55°	**MMT11IRA55-S**	★			48—16	6.35	3.04	0.8	0.9	0.07	—	Partial form
	MMT**16IRA55-S**	★			48—16	9.525	3.44	0.8	0.9	0.07	—	
	MMT**16IRG55-S**	★			14—8	9.525	3.44	1.2	1.7	0.21	—	
ISO Metric	**MMT11IR100ISO-S**	★		1.0		6.35	3.04	0.6	0.7	0.06	0.58	Full form
	MMT**11IR125ISO-S**	★		1.25		6.35	3.04	0.8	0.9	0.08	0.72	
	MMT**11IR150ISO-S**	★		1.5		6.35	3.04	0.8	1.0	0.10	0.87	
	MMT**16IR100ISO-S**	●	★	1.0		9.525	3.44	0.6	0.7	0.06	0.58	
	MMT**16IR125ISO-S**	●	★	1.25		9.525	3.44	0.8	0.9	0.08	0.72	
	MMT**16IR150ISO-S**	●	★	1.5		9.525	3.44	0.8	1.0	0.10	0.87	
	MMT**16IR175ISO-S**	●	★	1.75		9.525	3.44	0.9	1.2	0.11	1.01	
	MMT**16IR200ISO-S**	●	★	2.0		9.525	3.44	1.0	1.3	0.13	1.15	
	MMT**16IR250ISO-S**	●	★	2.5		9.525	3.44	1.1	1.5	0.17	1.44	
	MMT**16IR300ISO-S**	●	★	3.0		9.525	3.44	1.1	1.5	0.20	1.73	
American UN	**MMT16IR160UN-S**	●			16	9.525	3.44	0.9	1.1	0.11	0.92	Full form
	MMT**16IR140UN-S**	●			14	9.525	3.44	0.9	1.2	0.12	1.05	
	MMT**16IR120UN-S**	●			12	9.525	3.44	1.1	1.4	0.14	1.22	
Whitworth for BSW, BSP	**MMT16IR190W-S**	★			19	9.525	3.44	0.8	1.0	0.18	0.86	Full form
	MMT**16IR140W-S**	★			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT**16IR110W-S**	★			11	9.525	3.44	1.1	1.5	0.32	1.48	
BSPT	**MMT16IR190BSPT-S**	★			19	9.525	3.44	0.8	0.9	0.18	0.86	Full form
	MMT**16IR140BSPT-S**	★			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT**16IR110BSPT-S**	★			11	9.525	3.44	1.1	1.5	0.32	1.48	

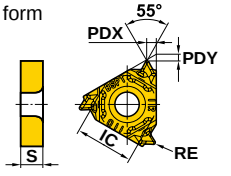










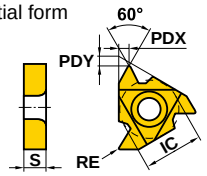


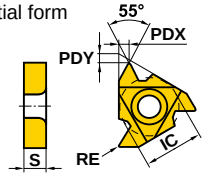
THREADING

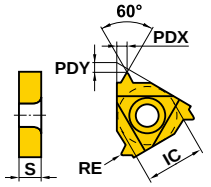
MMT G-CLASS GROUND INSERTS

EXTERNAL THREADING INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
Partial Profile 60°	—	**MMT16ERA60**	★	★	0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.05	—	Partial form
		MMT**16ERG60**	★	★	1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.27	—	
		MMT**16ERAG60**	★		0.5—3.0	48—8	9.525	3.44	1.2	1.7	0.08	—	
		MMT**22ERN60**	★		3.5—5.0	7—5	12.7	4.64	1.7	2.5	0.53	—	
Partial Profile 55°	—	**MMT16ERA55**	★	★		48—16	9.525	3.44	0.8	0.9	0.05	—	Partial form
		MMT**16ERG55**	★	★		14—8	9.525	3.44	1.2	1.7	0.21	—	
		MMT**16ERAG55**	★			48—8	9.525	3.44	1.2	1.7	0.07	—	
		MMT**22ERN55**	★			7—5	12.7	4.64	1.7	2.5	0.44	—	
ISO Metric	6g	**MMT16ER050ISO**	●		0.5		9.525	3.44	0.6	0.4	0.06	0.31	Full form
		MMT**16ER075ISO**	●		0.75		9.525	3.44	0.6	0.6	0.10	0.46	
		MMT**16ER100ISO**	●	★	1.0		9.525	3.44	0.7	0.7	0.16	0.61	
		MMT**16ER125ISO**	●	★	1.25		9.525	3.44	0.8	0.9	0.19	0.77	
		MMT**16ER150ISO**	●	★	1.5		9.525	3.44	0.8	1.0	0.23	0.92	
		MMT**16ER175ISO**	●	★	1.75		9.525	3.44	0.9	1.2	0.21	1.07	
		MMT**16ER200ISO**	●	★	2.0		9.525	3.44	1.0	1.3	0.31	1.23	
		MMT**16ER250ISO**	●	★	2.5		9.525	3.44	1.1	1.5	0.32	1.53	
		MMT**16ER300ISO**	●	★	3.0		9.525	3.44	1.2	1.6	0.46	1.84	
		MMT**22ER350ISO**	★		3.5		12.7	4.64	1.6	2.3	0.45	2.15	
		MMT**22ER400ISO**	★		4.0		12.7	4.64	1.6	2.3	0.52	2.45	
		MMT**22ER450ISO**	★		4.5		12.7	4.64	1.7	2.4	0.58	2.76	
		MMT**22ER500ISO**	★		5.0		12.7	4.64	1.7	2.5	0.63	3.07	







IDENTIFICATION

MMT **16** **E** **R** **050** **ISO**

Designation

Diameter of Inscribed Circle (mm)

11	6.35
16	9.525
22	12.7

Application

E	External
I	Internal

Hand of Tool

R	Right

Pitch

050	0.5mm	**A**	0.5—1.5mm or 48—16 thread/inch
075	0.75mm		
100	1.0mm	**G**	1.75—3.0mm or 14—8 thread/inch
125	1.25mm		
150	1.5mm		
175	1.75mm		
200	2.0mm	**AG**	0.5—3.0mm or 48—8 thread/inch
250	2.5mm		
300	3.0mm		
350	3.5mm		
400	4.0mm	**N**	3.5—5.0mm or 7—5 thread/inch
450	4.5mm		
500	5.0mm		

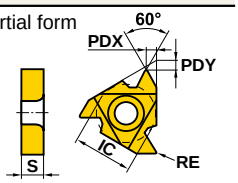
Threading Type

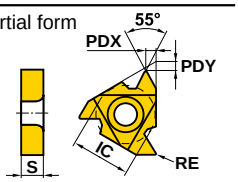
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN
RD	Round DIN 405
TR	ISO Trapezoidal 30°
ACME	American ACME
UNJ	UNJ
APBU	API Buttress Casing
APRD	API Round Casing &Tubing
NPT	NPT
NPTF	NPTF

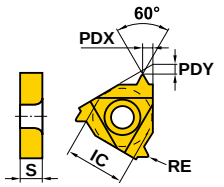
● : Inventory maintained. ★ : Inventory maintained in Japan.
<5 inserts in one case>

INTERNAL THREADING INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
Partial Profile 60°	—	**MMT11IRA60**	★	★	0.5—1.5	48—16	6.35	3.04	0.8	0.9	0.05	—	Partial form
		MMT16IRA60	★	★	0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.05	—	
		MMT16IRG60	★	★	1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.16	—	
		MMT16IRAG60	★		0.5—3.0	48—8	9.525	3.44	1.2	1.7	0.05	—	
		MMT22IRN60	★		3.5—5.0	7—5	12.7	4.64	1.7	2.5	0.30	—	
Partial Profile 55°	—	**MMT11IRA55**	★	★		48—16	6.35	3.04	0.8	0.9	0.05	—	Partial form
		MMT16IRA55	★	★		48—16	9.525	3.44	0.8	0.9	0.05	—	
		MMT16IRG55	★	★		14—8	9.525	3.44	1.2	1.7	0.21	—	
		MMT16IRAG55	★			48—8	9.525	3.44	1.2	1.7	0.07	—	
		MMT22IRN55	★			7—5	12.7	4.64	1.7	2.5	0.44	—	
ISO Metric	6H	**MMT11IR050ISO**	★		0.5		6.35	3.04	0.6	0.4	0.03	0.29	Full form
		MMT11IR075ISO	★		0.75		6.35	3.04	0.6	0.6	0.04	0.43	
		MMT11IR100ISO	★	★	1.0		6.35	3.04	0.6	0.7	0.10	0.58	
		MMT11IR125ISO	★	★	1.25		6.35	3.04	0.8	0.9	0.12	0.72	
		MMT11IR150ISO	★	★	1.5		6.35	3.04	0.8	1.0	0.14	0.87	
		MMT11IR175ISO	★		1.75		6.35	3.04	0.9	1.1	0.10	1.01	
		MMT11IR200ISO	★		2.0		6.35	3.04	0.9	1.1	0.18	1.15	
		MMT16IR050ISO	★		0.5		9.525	3.44	0.6	0.4	0.03	0.29	
		MMT16IR075ISO	★		0.75		9.525	3.44	0.6	0.6	0.04	0.43	
		MMT16IR100ISO	●	★	1.0		9.525	3.44	0.6	0.7	0.10	0.58	
		MMT16IR125ISO	●	★	1.25		9.525	3.44	0.8	0.9	0.12	0.72	
		MMT16IR150ISO	●	★	1.5		9.525	3.44	0.8	1.0	0.14	0.87	
		MMT16IR175ISO	●	★	1.75		9.525	3.44	0.9	1.2	0.10	1.01	
		MMT16IR200ISO	●	★	2.0		9.525	3.44	1.0	1.3	0.18	1.15	
		MMT16IR250ISO	●	★	2.5		9.525	3.44	1.1	1.5	0.15	1.44	
		MMT16IR300ISO	●	★	3.0		9.525	3.44	1.1	1.5	0.26	1.73	
		MMT22IR350ISO	★		3.5		12.7	4.64	1.6	2.3	0.22	2.02	
		MMT22IR400ISO	★		4.0		12.7	4.64	1.6	2.3	0.25	2.31	
		MMT22IR450ISO	★		4.5		12.7	4.64	1.6	2.4	0.28	2.60	
		MMT22IR500ISO	★		5.0		12.7	4.64	1.6	2.3	0.32	2.89	







IDENTIFICATION

MMT **16** **E** **R** **050** **ISO**

Designation

Diameter of Inscribed Circle (mm)

11	6.35
16	9.525
22	12.7

Application

E	External
I	Internal

Hand of Tool

R	Right

Pitch

050	0.5mm	**A**	0.5—1.5mm or 48—16 thread/inch
075	0.75mm		
100	1.0mm		
125	1.25mm	**G**	1.75—3.0mm or 14—8 thread/inch
150	1.5mm		
175	1.75mm		
200	2.0mm	**AG**	0.5—3.0mm or 48—8 thread/inch
250	2.5mm		
300	3.0mm		
350	3.5mm	**N**	3.5—5.0mm or 7—5 thread/inch
400	4.0mm		
450	4.5mm		
500	5.0mm		

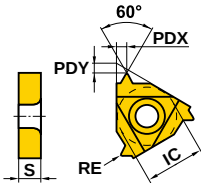
Threading Type

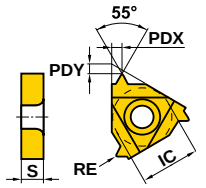
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN
RD	Round DIN 405
TR	ISO Trapezoidal 30°
ACME	American ACME
UNJ	UNJ
APBU	API Buttress Casing
APRD	API Round Casing &Tubing
NPT	NPT
NPTF	NPTF

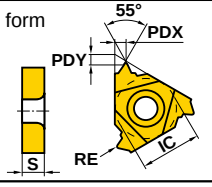
MMT G-CLASS GROUND INSERTS

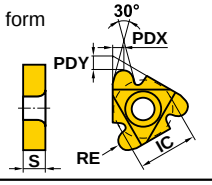
EXTERNAL THREADING INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
American UN	2A	MMT16ER320UN	●			32	9.525	3.44	0.6	0.6	0.09	0.49	Full form
		MMT16ER280UN	●			28	9.525	3.44	0.6	0.7	0.10	0.56	
		MMT16ER240UN	●			24	9.525	3.44	0.7	0.8	0.16	0.65	
		MMT16ER200UN	●			20	9.525	3.44	0.8	0.9	0.19	0.78	
		MMT16ER180UN	●			18	9.525	3.44	0.8	1.0	0.21	0.87	
		MMT16ER160UN	●	★		16	9.525	3.44	0.9	1.1	0.24	0.97	
		MMT16ER140UN	●	★		14	9.525	3.44	1.0	1.2	0.22	1.11	
		MMT16ER130UN	●			13	9.525	3.44	1.0	1.3	0.24	1.20	
		MMT16ER120UN	●	★		12	9.525	3.44	1.1	1.4	0.32	1.30	
		MMT16ER110UN	●			11	9.525	3.44	1.1	1.5	0.29	1.42	
		MMT16ER100UN	●			10	9.525	3.44	1.1	1.5	0.32	1.56	
		MMT16ER090UN	●			9	9.525	3.44	1.2	1.7	0.35	1.73	
		MMT16ER080UN	●			8	9.525	3.44	1.2	1.6	0.48	1.95	
		MMT22ER070UN	★			7	12.7	4.64	1.6	2.3	0.47	2.22	
		MMT22ER060UN	★			6	12.7	4.64	1.6	2.3	0.53	2.60	
		MMT22ER050UN	★			5	12.7	4.64	1.7	2.5	0.64	3.12	
Whitworth for BSW, BSP	Medium Class A	MMT16ER280W	★			28	9.525	3.44	0.6	0.7	0.09	0.58	Full form
		MMT16ER260W	★			26	9.525	3.44	0.7	0.8	0.10	0.63	
		MMT16ER200W	★			20	9.525	3.44	0.8	0.9	0.18	0.81	
		MMT16ER190W	★	★		19	9.525	3.44	0.8	1.0	0.19	0.86	
		MMT16ER180W	★			18	9.525	3.44	0.8	1.0	0.20	0.90	
		MMT16ER160W	★			16	9.525	3.44	0.9	1.1	0.23	1.02	
		MMT16ER140W	★	★		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16ER120W	★			12	9.525	3.44	1.1	1.4	0.30	1.36	
		MMT16ER110W	★	★		11	9.525	3.44	1.1	1.5	0.33	1.48	
		MMT16ER100W	★			10	9.525	3.44	1.1	1.5	0.37	1.63	
		MMT16ER090W	★			9	9.525	3.44	1.2	1.7	0.34	1.81	
		MMT16ER080W	★			8	9.525	3.44	1.2	1.5	0.39	2.03	
		MMT22ER070W	★			7	12.7	4.64	1.6	2.3	0.46	2.32	
		MMT22ER060W	★			6	12.7	4.64	1.6	2.3	0.53	2.71	
		MMT22ER050W	★			5	12.7	4.64	1.7	2.4	0.66	3.25	
BSPT	Standard BSPT	MMT16ER280BSPT	★			28	9.525	3.44	0.6	0.6	0.09	0.58	Full form
		MMT16ER190BSPT	★	★		19	9.525	3.44	0.8	0.9	0.14	0.86	
		MMT16ER140BSPT	★	★		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16ER110BSPT	★	★		11	9.525	3.44	1.1	1.5	0.33	1.48	
Round DIN 405	7h	MMT16ER100RD	★			10	9.525	3.44	1.1	1.2	0.60	1.27	Full form
		MMT16ER080RD	★			8	9.525	3.44	1.4	1.3	0.75	1.59	
		MMT16ER060RD	★			6	9.525	3.44	1.5	1.7	1.00	2.12	
		MMT22ER040RD	★			4	9.525	3.44	2.2	2.3	1.51	3.18	





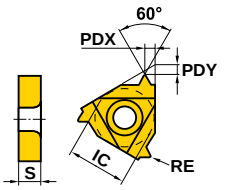


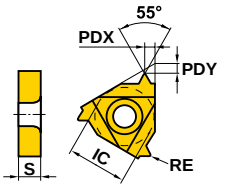


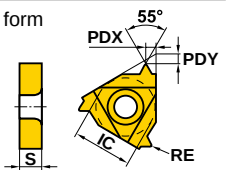
● : Inventory maintained. ★ : Inventory maintained in Japan.
<5 inserts in one case>

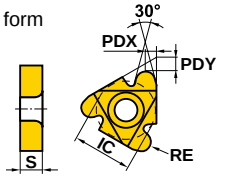
INTERNAL THREADING INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
American UN	2B	**MMT11IR320UN**	★			32	6.35	3.04	0.6	0.6	0.04	0.46	Full form
		MMT**11IR280UN**	★			28	6.35	3.04	0.6	0.7	0.05	0.52	
		MMT**11IR240UN**	★			24	6.35	3.04	0.7	0.8	0.09	0.61	
		MMT**11IR200UN**	★			20	6.35	3.04	0.8	0.9	0.11	0.73	
		MMT**11IR180UN**	★			18	6.35	3.04	0.8	1.0	0.12	0.81	
		MMT**11IR160UN**	★			16	6.35	3.04	0.9	1.1	0.14	0.92	
		MMT**11IR140UN**	★			14	6.35	3.04	0.9	1.1	0.11	1.05	
		MMT**16IR320UN**	●			32	9.525	3.44	0.6	0.6	0.04	0.46	
		MMT**16IR280UN**	●			28	9.525	3.44	0.6	0.7	0.05	0.52	
		MMT**16IR240UN**	●			24	9.525	3.44	0.7	0.8	0.09	0.61	
		MMT**16IR200UN**	●			20	9.525	3.44	0.8	0.9	0.11	0.73	
		MMT**16IR180UN**	●			18	9.525	3.44	0.8	1.0	0.12	0.81	
		MMT**16IR160UN**	●	★		16	9.525	3.44	0.9	1.1	0.14	0.92	
		MMT**16IR140UN**	●	★		14	9.525	3.44	0.9	1.2	0.11	1.05	
		MMT**16IR130UN**	●			13	9.525	3.44	1.0	1.3	0.10	1.13	
		MMT**16IR120UN**	●	★		12	9.525	3.44	1.1	1.4	0.18	1.22	
		MMT**16IR110UN**	●			11	9.525	3.44	1.1	1.5	0.13	1.33	
		MMT**16IR100UN**	●			10	9.525	3.44	1.1	1.5	0.15	1.47	
		MMT**16IR090UN**	●			9	9.525	3.44	1.2	1.7	0.17	1.63	
		MMT**16IR080UN**	●			8	9.525	3.44	1.1	1.5	0.27	1.83	
		MMT**22IR070UN**	★			7	12.7	4.64	1.6	2.3	0.23	2.09	
		MMT**22IR060UN**	★			6	12.7	4.64	1.6	2.3	0.26	2.44	
		MMT**22IR050UN**	★			5	12.7	4.64	1.6	2.3	0.32	2.93	
Whitworth for BSW, BSP	Medium Class A	**MMT11IR190W**	★			19	6.35	3.04	0.8	1.0	0.19	0.86	Full form
		MMT**11IR140W**	★			14	6.35	3.04	0.9	1.1	0.26	1.16	
		MMT**16IR280W**	★			28	9.525	3.44	0.6	0.7	0.09	0.58	
		MMT**16IR260W**	★			26	9.525	3.44	0.7	0.8	0.10	0.63	
		MMT**16IR200W**	★			20	9.525	3.44	0.8	0.9	0.18	0.81	
		MMT**16IR190W**	★	★		19	9.525	3.44	0.8	1.0	0.19	0.86	
		MMT**16IR180W**	★			18	9.525	3.44	0.8	1.0	0.20	0.90	
		MMT**16IR160W**	★			16	9.525	3.44	0.9	1.1	0.23	1.02	
		MMT**16IR140W**	★	★		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT**16IR120W**	★			12	9.525	3.44	1.1	1.4	0.30	1.36	
		MMT**16IR110W**	★	★		11	9.525	3.44	1.1	1.5	0.33	1.48	
		MMT**16IR100W**	★			10	9.525	3.44	1.1	1.5	0.37	1.63	
		MMT**16IR090W**	★			9	9.525	3.44	1.2	1.7	0.34	1.81	
		MMT**16IR080W**	★			8	9.525	3.44	1.2	1.5	0.39	2.03	
		MMT**22IR070W**	★			7	12.7	4.64	1.6	2.3	0.46	2.32	
		MMT**22IR060W**	★			6	12.7	4.64	1.6	2.3	0.53	2.71	
		MMT**22IR050W**	★			5	12.7	4.64	1.7	2.4	0.66	3.25	
BSPT	Standard BSPT	**MMT11IR190BSPT**	★			19	6.35	3.04	0.8	0.9	0.14	0.86	Full form
		MMT**11IR140BSPT**	★			14	6.35	3.04	0.9	1.0	0.26	1.16	
		MMT**16IR190BSPT**	★	★		19	9.525	3.44	0.8	0.9	0.14	0.86	
		MMT**16IR140BSPT**	★	★		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT**16IR110BSPT**	★	★		11	9.525	3.44	1.1	1.5	0.33	1.48	
Round DIN 405	7H	**MMT16IR100RD**	★			10	9.525	3.44	1.1	1.2	0.55	1.27	Full form
		MMT**16IR080RD**	★			8	9.525	3.44	1.4	1.4	0.70	1.59	
		MMT**16IR060RD**	★			6	9.525	3.44	1.4	1.5	0.93	2.12	
		MMT**22IR040RD**	★			4	12.7	4.64	2.2	2.3	1.40	3.18	









THREADING

MMT G-CLASS GROUND INSERTS

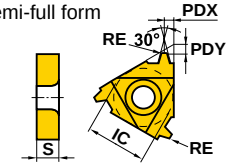
EXTERNAL THREADING INSERTS

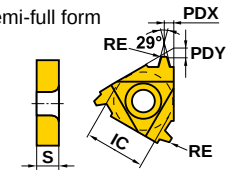
Type	Thread Tolerance	Order Number	Coated VP10MF		Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
ISO Trapezoidal 30°	7e	MMT16ER150TR	★		1.5		9.525	3.44	1.0	1.1	0.08	0.90	Semi-full form
		MMT16ER200TR	★		2.0		9.525	3.44	1.1	1.3	0.15	1.25	
		MMT16ER300TR	★		3.0		9.525	3.44	1.3	1.5	0.15	1.75	
		MMT22ER400TR	★		4.0		12.7	4.64	1.7	1.9	0.15	2.25	
		MMT22ER500TR	★		5.0		12.7	4.64	2.1	2.5	0.15	2.75	
American ACME	3G	MMT16ER120ACME	●			12	9.525	3.44	1.1	1.2	0.08	1.19	Semi-full form
		MMT16ER100ACME	●			10	9.525	3.44	1.3	1.4	0.08	1.52	
		MMT16ER080ACME	●			8	9.525	3.44	1.4	1.5	0.10	1.84	
		MMT22ER060ACME	●			6	12.7	4.64	1.8	2.1	0.10	2.37	
		MMT22ER050ACME	●			5	12.7	4.64	2.0	2.3	0.10	2.79	
UNJ	3A	MMT16ER320UNJ	★			32	9.525	3.44	0.6	0.7	0.13	0.46	Full form
		MMT16ER280UNJ	★			28	9.525	3.44	0.7	0.7	0.14	0.52	
		MMT16ER240UNJ	★			24	9.525	3.44	0.7	0.8	0.17	0.61	
		MMT16ER200UNJ	★			20	9.525	3.44	0.8	0.9	0.20	0.73	
		MMT16ER180UNJ	★			18	9.525	3.44	0.8	1.0	0.22	0.81	
		MMT16ER160UNJ	★			16	9.525	3.44	0.9	1.1	0.25	0.92	
		MMT16ER140UNJ	★			14	9.525	3.44	1.0	1.2	0.29	1.05	
		MMT16ER120UNJ	★			12	9.525	3.44	1.1	1.3	0.33	1.22	
		MMT16ER100UNJ	★			10	9.525	3.44	1.2	1.5	0.40	1.47	
		MMT16ER080UNJ	★			8	9.525	3.44	1.2	1.6	0.51	1.83	
API Buttress Casing	Standard API	MMT22ER050APBU	★			5	12.7	4.64	3.1	1.9	0.18	1.55	Full form
API Round Casing & Tubing	Standard API RD	MMT16ER100APRD	●			10	9.525	3.44	1.2	1.4	0.34	1.41	Full form
		MMT16ER080APRD	●			8	9.525	3.44	1.3	1.5	0.41	1.81	
American NPT	Standard NPT	MMT16ER270NPT	●			27	9.525	3.44	0.7	0.8	0.04	0.66	Full form
		MMT16ER180NPT	●			18	9.525	3.44	0.8	1.0	0.08	1.01	
		MMT16ER140NPT	●			14	9.525	3.44	0.9	1.2	0.09	1.33	
		MMT16ER115NPT	●			11.5	9.525	3.44	1.1	1.5	0.11	1.64	
		MMT16ER080NPT	●			8	9.525	3.44	1.3	1.8	0.14	2.42	
American NPTF	Class 2	MMT16ER270NPTF	★			27	9.525	3.44	0.7	0.8	0.04	0.64	Full form
		MMT16ER180NPTF	★			18	9.525	3.44	0.8	1.0	0.04	1.00	
		MMT16ER140NPTF	★			14	9.525	3.44	0.9	1.2	0.04	1.35	
		MMT16ER115NPTF	★			11.5	9.525	3.44	1.1	1.5	0.04	1.63	
		MMT16ER080NPTF	★			8	9.525	3.44	1.3	1.8	0.04	2.38	

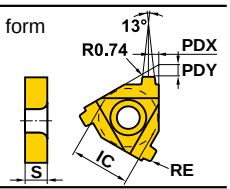
● : Inventory maintained. ★ : Inventory maintained in Japan.
<5 inserts in one case>

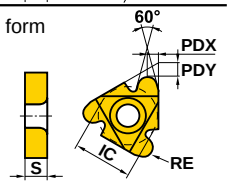
INTERNAL THREADING INSERTS

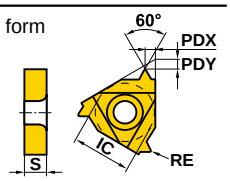
Type	Thread Tolerance	Order Number	Coated VP10MF		Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
ISO Trapezoidal 30°	7H	**MMT16IR150TR**	★		1.5		9.525	3.44	1.0	1.1	0.08	0.90	Semi-full form
		MMT**16IR200TR**	★		2.0		9.525	3.44	1.1	1.3	0.15	1.25	
		MMT**16IR300TR**	★		3.0		9.525	3.44	1.3	1.5	0.15	1.75	
		MMT**22IR400TR**	★		4.0		12.7	4.64	1.7	1.9	0.15	2.25	
		MMT**22IR500TR**	★		5.0		12.7	4.64	2.1	2.5	0.15	2.75	
American ACME	3G	**MMT16IR120ACME**	●			12	9.525	3.44	1.2	1.3	0.05	1.19	Semi-full form
		MMT**16IR100ACME**	●			10	9.525	3.44	1.2	1.3	0.08	1.52	
		MMT**16IR080ACME**	●			8	9.525	3.44	1.4	1.5	0.10	1.84	
		MMT**22IR060ACME**	●			6	12.7	4.64	1.8	2.1	0.10	2.37	
		MMT**22IR050ACME**	●			5	12.7	4.64	2.0	2.3	0.10	2.79	
UNJ		When machining an internal UNJ thread, cut an internal hole with the appropriate diameter. Then machine with 60° American UN. In this case, a full form type insert cannot be used.											
API Buttress Casing	Standard API	**MMT22IR050APBU**	★			5	12.7	4.64	2.8	1.9	0.18	1.55	Full form
API Round Casing & Tubing	Standard API RD	**MMT16IR100APRD**	●			10	9.525	3.44	1.2	1.4	0.34	1.41	Full form
		MMT**16IR080APRD**	●			8	9.525	3.44	1.3	1.5	0.41	1.81	
American NPT	Standard NPT	**MMT16IR270NPT**	●			27	9.525	3.44	0.7	0.8	0.04	0.66	Full form
		MMT**16IR180NPT**	●			18	9.525	3.44	0.8	1.0	0.08	1.01	
		MMT**16IR140NPT**	●			14	9.525	3.44	0.9	1.2	0.09	1.33	
		MMT**16IR115NPT**	●			11.5	9.525	3.44	1.1	1.5	0.11	1.64	
		MMT**16IR080NPT**	●			8	9.525	3.44	1.3	1.8	0.14	2.42	
American NPTF	Class 2	**MMT16IR140NPTF**	★			14	9.525	3.44	0.9	1.2	0.04	1.35	Full form
		MMT**16IR115NPTF**	★			11.5	9.525	3.44	1.1	1.5	0.04	1.63	
		MMT**16IR080NPTF**	★			8	9.525	3.44	1.3	1.8	0.04	2.38	

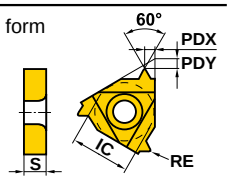






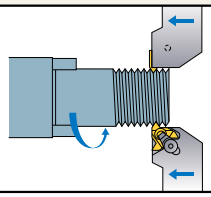
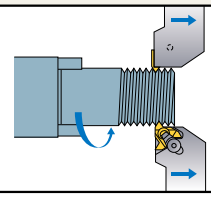
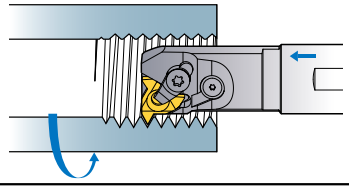
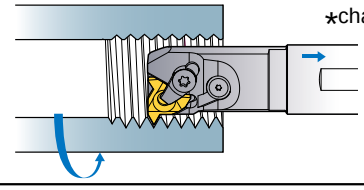






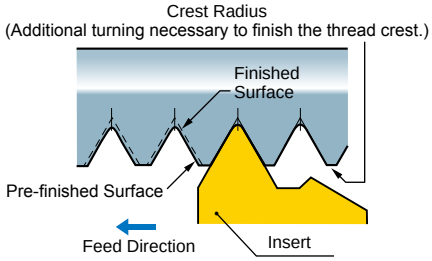
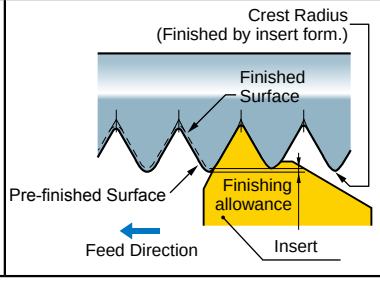
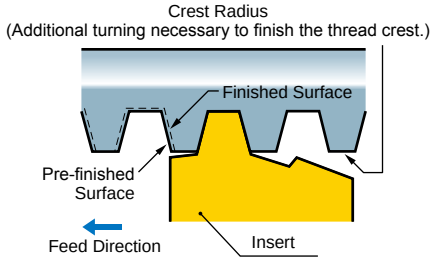
THREADING

THREADING METHODS

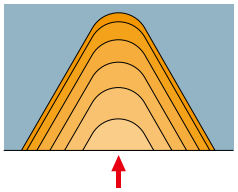
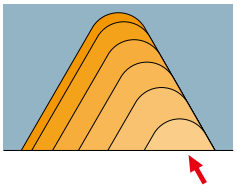
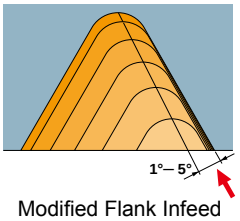
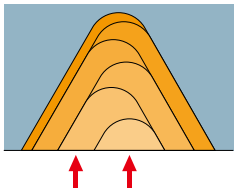
	Right Hand Thread	Left Hand Thread
EXTERNAL		 *change the shim
INTERNAL		 *change the shim

· Usually, threads are cut feeding the insert towards the chuck.
· When machining left hand threads, note that clamping rigidity is lowered due the application of back turning.
· When machining left hand threads, the lead angle is negative. Ensure an appropriate lead angle by changing the shim.

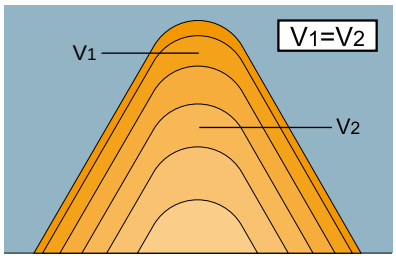
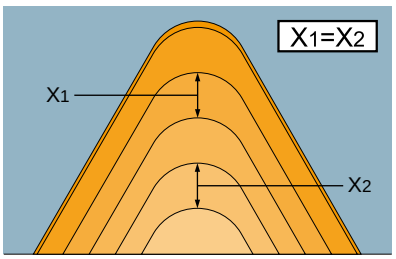
INSERT TYPES

Partial Form	Full Form	Semi Full Form (Trapezoidal threads only)
● The same insert can be used for a range of pitches. ● Shorter tool life because the nose radius of the insert is smaller than that of a full form insert. ● Finishing with another operation may be necessary.	● No deburring needed after threading. ● Requires specific insert for each thread form and pitch.	● No de-burring needed after threading. ● Requires specific insert for each thread form and pitch. ● Finishing with another operation may be necessary.
		

INFEED METHODS

	Radial Infeed	Flank Infeed	Modified Flank Infeed	Incremental Infeed
				
Features – Advantages	● Easiest to use. (Standard program for threading) ● Wide application. (Cutting conditions easy to change.) ● Uniform wear of the right and left sides of the cutting edge.	● Relatively easy to use. (Semi-standard program for threading.) ● Reduced cutting force. ● Suitable for large pitch threads or materials that peel easily. ● Good chip discharge.	● Preventing flank wear on the right side of the cutting edge. ● Reduced cutting force. ● Good for large pitch or materials that peel easily. ● Good chip discharge.	● Uniform wear of the right and left sides of the cutting edge. ● Reduced cutting force. ● Good for large pitch or materials that peel easily.
Features – Disadvantages	● Difficult chip control. ● Subject to vibration in the later passes due to long cutting edge in contact with workpiece. ● Ineffective for large pitch threading. ● Heavy load on the nose radius.	● Large flank wear of the right side of a cutting edge. ● Relatively difficult to change cutting depth. (Re-programming necessary)	● Complex machining programming. ● Difficult to change cutting depth. (NC programming necessary)	● Complex machining programming. ● Difficult to change cutting depth. (Re-programming necessary) ● Chip control is difficult.

THREADING DEPTH

	Features	
	Advantages	Disadvantages
 Fixed cut area	· Easy to use. (Standard program for threading.) · Superior resistance to vibration. (Constant cutting force.)	· Long chips generated during the final pass. · Complex calculation of cutting depth when changing the number of passes.
 Fixed cutting depth	· Reduced load on nose radius during the first half of the passes. · Easy chip control. (Optional setting of chip thickness) · Easy to calculate cutting depth when changing the number of passes. · Good chip control.	· Subject to vibration in the later stages of cutting. (Increased cutting force) · In some cases, changing the NC program is necessary.

* It is recommended to set the depth of cut of the final pass to 0.05mm–0.025mm.
Large cutting depths can cause vibration, leading to a poor surface finish.

Formulas

Formulas to calculate infeed for each pass in a reduced series.

$$\triangle ap_n = \frac{ap}{\sqrt{n_{ap}-1}} \times \sqrt{b}$$

$\triangle ap_n$: Depth of cut
n : Actual pass
ap : Total depth of cut
n_{ap} : Number of passes
b : 1st pass 0.3
2nd pass 2–1=1
3rd pass 3–1=2
·
·
nth pass

Example) External threading (ISO metric)
Pitch : 1.0mm
ap : 0.6mm
n_{ap} : 5

1st pass $\triangle ap_1 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{0.3} = 0.16 \rightarrow$ **0.16** ($\triangle ap_1$)

2nd pass $\triangle ap_2 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{2-1} = 0.3 \rightarrow$ **0.14** ($\triangle ap_2 - \triangle ap_1$)

3rd pass $\triangle ap_3 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{3-1} = 0.42 \rightarrow$ **0.12** ($\triangle ap_3 - \triangle ap_2$)

4th pass $\triangle ap_4 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{4-1} = 0.52 \rightarrow$ **0.1** ($\triangle ap_4 - \triangle ap_3$)

5th pass $\triangle ap_5 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{5-1} = 0.6 \rightarrow$ **0.08** ($\triangle ap_5 - \triangle ap_4$)

NC Program for Modified Flank Infeed

Example:- M12×1.0 5 passes modified 1°-3°

(mm)

External Threading	Internal Treading
G00 Z = 5.0 X = 14.0 G92 U–4.34 Z–13.0 F1.0 G00 W–0.07 G92 U–4.64 Z–13.0 F1.0 G00 W–0.06 G92 U–4.88 Z–13.0 F1.0 G00 W–0.05 G92 U–5.08 Z–13.0 F1.0 G00 W–0.03 G92 U–5.20 Z–13.0 F1.0 G00	G00 Z = 5.0 X = 10.0 G92 U4.34 Z–13.0 F1.0 G00 W–0.07 G92 U4.64 Z–13.0 F1.0 G00 W–0.05 G92 U4.84 Z–13.0 F1.0 G00 W–0.04 G92 U5.02 Z–13.0 F1.0 G00 W–0.03 G92 U5.14 Z–13.0 F1.0 G00

RECOMMENDED CUTTING METHODS AND CONDITIONS

Selecting Cutting Conditions

		Priority					
		Tool life	Cutting force	Surface finish	Precision of thread	Chips discharge	Efficiency (Reduced passes)
Threading methods	Radial	○		○	○		○
	Flank	(△ : Modified)	○	(△ : Modified)		○	
Cutting depth	Fixed cutting depth					○	
	Fixed cut area	○	○	○	○		○

Note) ・Tool life and surface finish accuracy can be increased by changing the threading method from flank infeed to modified flank infeed.
・Chip control can be improved by increasing the cutting depth in the later half of passes.

Cutting depth and the number of passes

Selection of the appropriate cutting depth and the right number of passes is vital for threading.

・For most threading, use a "threading cycle program," which has originally been installed on machines, and specify "total cutting depth" and "cutting depth in the first or final pass."

・Cutting depth and the number of passes are easy to change for the radial infeed method, thus making it easy to determine the appropriate cutting conditions.

Feature and benefits of Mitsubishi products

・Insert grades, specially produced for threading tools, ensure highly efficient cutting by enabling high-speed machining and a reduced number of passes.

Machining Cost Reduction

Advice on improved threading

Increasing tool life

・To prevent damage to the nose radius - Recommended method - Modified flank infeed.

・To have uniform flank wear on both sides of a cutting edge - Recommended method - Radial infeed

・To prevent crater wear - Recommended method - Flank infeed

Preventing chip problems

・Change to flank or modified infeed.

・During radial infeed cutting, use an inverted holder and change the coolant supply to a downward direction.

・When using the radial infeed method, set the minimum cutting depth at around .008 inch to make the chips thicker.

・Tangled chips during internal threading can damage the insert. In these cases, pause slightly away from the start point and clear the chips with coolant before every pass.

・Change to M-class inserts with a 3-D chip breaker.

To achieve highly efficient machining

・Increase cutting speed. (Dependant on the maximum revolution and rigidity of the machine.)

・Reduce the number of passes. (Reduce by 30-40%.)

・A reduced number of passes can improve chip discharge because of the thicker chips generated.

Preventing vibration

・Change to flank or modified infeed.

・When using radial infeed, reduce cutting depth in the later half of passes and lower the cutting speed.

Increased surface finish accuracy

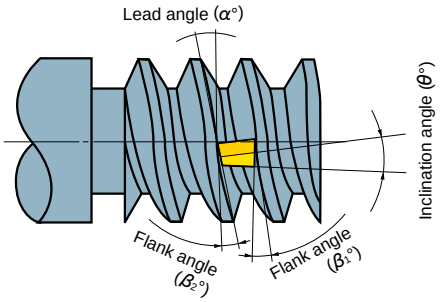
・A final pass should be performed at the same depth of cut as the last regular pass.

・When using the flank infeed method, change to radial infeed only during the final pass.

Selecting a Shim for the MMT Series

Flank angle and lead angle

Lead angle (α) depends on a combination of thread diameter and pitch.
Select a shim so that the lead angle of the thread can coincide with the flank angles of the thread and insert (β_1, β_2). When threading with a small diameter or large pitch, change the shim depending on the lead angle, referring to the table and graph below. When threading left hand threads, change to a shim with a negative inclination angle.



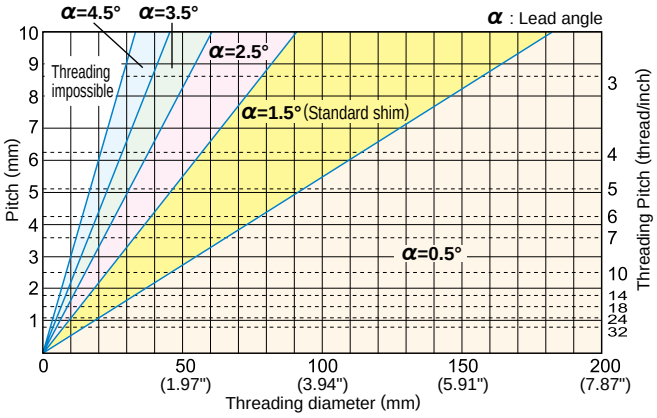
Shim reference table (Threading diameter–Thread angle 60° and 55°)

Pitch (mm) \ Lead Angle	Right Hand Thread (mm)						Left Hand Thread (mm)		
	Threading impossible	4.5°	3.5°	2.5°	1.5°	0.5°	Threading impossible	−1.5°	−0.5°
0.5	≤ϕ1.7	ϕ1.7 − ϕ2.3	ϕ2.3 − ϕ3.0	ϕ3.0 − ϕ4.6	ϕ4.6 − ϕ9.1	≥ϕ9.1	≤ϕ3.6	ϕ3.6 − ϕ9.1	≥ϕ9.1
0.75	≤ϕ2.5	ϕ2.5 − ϕ3.4	ϕ3.4 − ϕ4.6	ϕ4.6 − ϕ6.8	ϕ6.8 − ϕ13.7	≥ϕ13.7	≤ϕ5.5	ϕ5.5 − ϕ13.7	≥ϕ13.7
1	≤ϕ3.3	ϕ3.3 − ϕ4.6	ϕ4.6 − ϕ6.1	ϕ6.1 − ϕ9.1	ϕ9.1 − ϕ18.2	≥ϕ18.2	≤ϕ7.3	ϕ7.3 − ϕ18.2	≥ϕ18.2
1.25	≤ϕ4.1	ϕ4.1 − ϕ5.7	ϕ5.7 − ϕ7.6	ϕ7.6 − ϕ11.4	ϕ11.4 − ϕ22.8	≥ϕ22.8	≤ϕ9.1	ϕ9.1 − ϕ22.8	≥ϕ22.8
1.5	≤ϕ5.0	ϕ5.0 − ϕ6.8	ϕ6.8 − ϕ9.1	ϕ9.1 − ϕ13.7	ϕ13.7 − ϕ27.4	≥ϕ27.4	≤ϕ10.9	ϕ10.9 − ϕ27.4	≥ϕ27.4
1.75	≤ϕ5.8	ϕ5.8 − ϕ8.0	ϕ8.0 − ϕ10.6	ϕ10.6 − ϕ16.0	ϕ16.0 − ϕ31.9	≥ϕ31.9	≤ϕ12.8	ϕ12.8 − ϕ31.9	≥ϕ31.9
2	≤ϕ6.6	ϕ6.6 − ϕ9.1	ϕ9.1 − ϕ12.1	ϕ12.1 − ϕ18.2	ϕ18.2 − ϕ36.5	≥ϕ36.5	≤ϕ14.6	ϕ14.6 − ϕ36.5	≥ϕ36.5
2.5	≤ϕ8.3	ϕ8.3 − ϕ11.4	ϕ11.4 − ϕ15.2	ϕ15.2 − ϕ22.8	ϕ22.8 − ϕ45.6	≥ϕ45.6	≤ϕ18.2	ϕ18.2 − ϕ45.6	≥ϕ45.6
3	≤ϕ9.9	ϕ9.9 − ϕ13.7	ϕ13.7 − ϕ18.2	ϕ18.2 − ϕ27.3	ϕ27.3 − ϕ54.7	≥ϕ54.7	≤ϕ21.9	ϕ21.9 − ϕ54.7	≥ϕ54.7
3.5	≤ϕ11.6	ϕ11.6 − ϕ15.9	ϕ15.9 − ϕ21.3	ϕ21.3 − ϕ31.9	ϕ31.9 − ϕ63.8	≥ϕ63.8	≤ϕ25.5	ϕ25.5 − ϕ63.8	≥ϕ63.8
4	≤ϕ13.2	ϕ13.2 − ϕ18.2	ϕ18.2 − ϕ24.3	ϕ24.3 − ϕ36.5	ϕ36.5 − ϕ72.9	≥ϕ72.9	≤ϕ29.2	ϕ29.2 − ϕ72.9	≥ϕ72.9
4.5	≤ϕ14.9	ϕ14.9 − ϕ20.5	ϕ20.5 − ϕ27.3	ϕ27.3 − ϕ41.0	ϕ41.0 − ϕ82.1	≥ϕ82.1	≤ϕ32.8	ϕ32.8 − ϕ82.1	≥ϕ82.1
5	≤ϕ16.5	ϕ16.5 − ϕ22.8	ϕ22.8 − ϕ30.4	ϕ30.4 − ϕ45.6	ϕ45.6 − ϕ91.2	≥ϕ91.2	≤ϕ36.5	ϕ36.5 − ϕ91.2	≥ϕ91.2

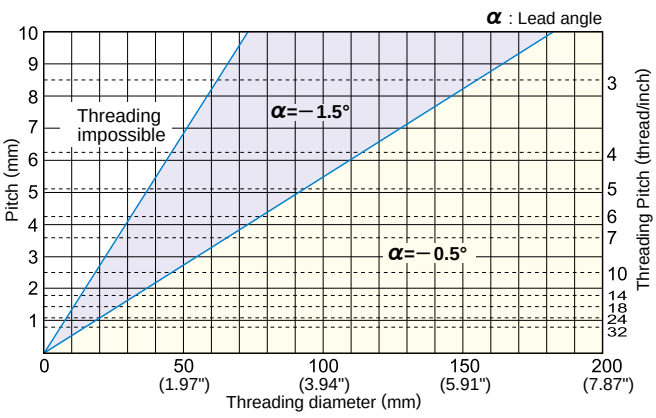
(Note) Back turning in the case of left hand threads.

Shim reference graph(Thread angle 60° and 55°)

Right Hand Thread



Left Hand Thread



Note) When a thread lead angle ≤ the tool flank angle, change the shim to prevent side interference with the insert.
(Refer to the table below for the calculation of thread lead angle and tool flank angle.)

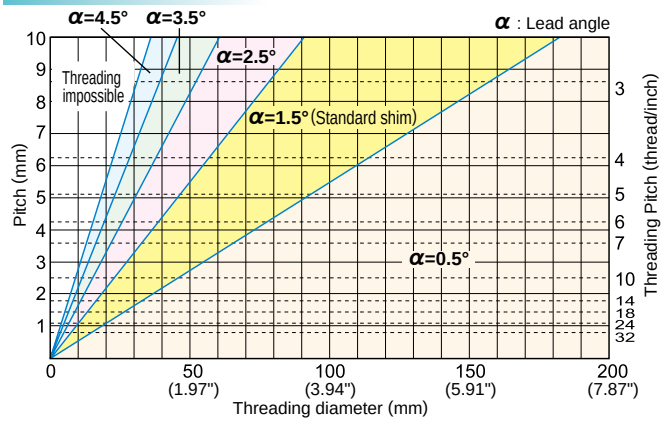
Shim reference table (Threading diameter–Thread angle 30° and 29°)

Pitch (mm) \ Lead Angle	Right Hand Thread (mm)						Left Hand Thread (mm)		
	Threading impossible	4.5°	3.5°	2.5°	1.5°	0.5°	Threading impossible	−1.5°	−0.5°
0.5	≤ϕ1.8	ϕ1.8 − ϕ2.3	ϕ2.3 − ϕ3.0	ϕ3.0 − ϕ4.6	ϕ4.6 − ϕ9.1	≥ϕ9.1	≤ϕ4.6	ϕ4.6 − ϕ9.1	≥ϕ9.1
0.75	≤ϕ2.7	ϕ2.7 − ϕ3.4	ϕ3.4 − ϕ4.6	ϕ4.6 − ϕ6.8	ϕ6.8 − ϕ13.7	≥ϕ13.7	≤ϕ6.8	ϕ6.8 − ϕ13.7	≥ϕ13.7
1	≤ϕ3.6	ϕ3.6 − ϕ4.6	ϕ4.6 − ϕ6.1	ϕ6.1 − ϕ9.1	ϕ9.1 − ϕ18.2	≥ϕ18.2	≤ϕ9.1	ϕ9.1 − ϕ18.2	≥ϕ18.2
1.25	≤ϕ4.5	ϕ4.5 − ϕ5.7	ϕ5.7 − ϕ7.6	ϕ7.6 − ϕ11.4	ϕ11.4 − ϕ22.8	≥ϕ22.8	≤ϕ11.4	ϕ11.4 − ϕ22.8	≥ϕ22.8
1.5	≤ϕ5.5	ϕ5.5 − ϕ6.8	ϕ6.8 − ϕ9.1	ϕ9.1 − ϕ13.7	ϕ13.7 − ϕ27.4	≥ϕ27.4	≤ϕ13.7	ϕ13.7 − ϕ27.4	≥ϕ27.4
1.75	≤ϕ6.4	ϕ6.4 − ϕ8.0	ϕ8.0 − ϕ10.6	ϕ10.6 − ϕ16.0	ϕ16.0 − ϕ31.9	≥ϕ31.9	≤ϕ16.0	ϕ16.0 − ϕ31.9	≥ϕ31.9
2	≤ϕ7.3	ϕ7.3 − ϕ9.1	ϕ9.1 − ϕ12.1	ϕ12.1 − ϕ18.2	ϕ18.2 − ϕ36.5	≥ϕ36.5	≤ϕ18.2	ϕ18.2 − ϕ36.5	≥ϕ36.5
2.5	≤ϕ9.1	ϕ9.1 − ϕ11.4	ϕ11.4 − ϕ15.2	ϕ15.2 − ϕ22.8	ϕ22.8 − ϕ45.6	≥ϕ45.6	≤ϕ22.8	ϕ22.8 − ϕ45.6	≥ϕ45.6
3	≤ϕ10.9	ϕ10.9 − ϕ13.7	ϕ13.7 − ϕ18.2	ϕ18.2 − ϕ27.3	ϕ27.3 − ϕ54.7	≥ϕ54.7	≤ϕ27.3	ϕ27.3 − ϕ54.7	≥ϕ54.7
3.5	≤ϕ12.7	ϕ12.7 − ϕ15.9	ϕ15.9 − ϕ21.3	ϕ21.3 − ϕ31.9	ϕ31.9 − ϕ63.8	≥ϕ63.8	≤ϕ31.9	ϕ31.9 − ϕ63.8	≥ϕ63.8
4	≤ϕ14.6	ϕ14.6 − ϕ18.2	ϕ18.2 − ϕ24.3	ϕ24.3 − ϕ36.5	ϕ36.5 − ϕ72.9	≥ϕ72.9	≤ϕ36.5	ϕ36.5 − ϕ72.9	≥ϕ72.9
4.5	≤ϕ16.4	ϕ16.4 − ϕ20.5	ϕ20.5 − ϕ27.3	ϕ27.3 − ϕ41.0	ϕ41.0 − ϕ82.1	≥ϕ82.1	≤ϕ41.0	ϕ41.0 − ϕ82.1	≥ϕ82.1
5	≤ϕ18.2	ϕ18.2 − ϕ22.8	ϕ22.8 − ϕ30.4	ϕ30.4 − ϕ45.6	ϕ45.6 − ϕ91.2	≥ϕ91.2	≤ϕ45.6	ϕ45.6 − ϕ91.2	≥ϕ91.2

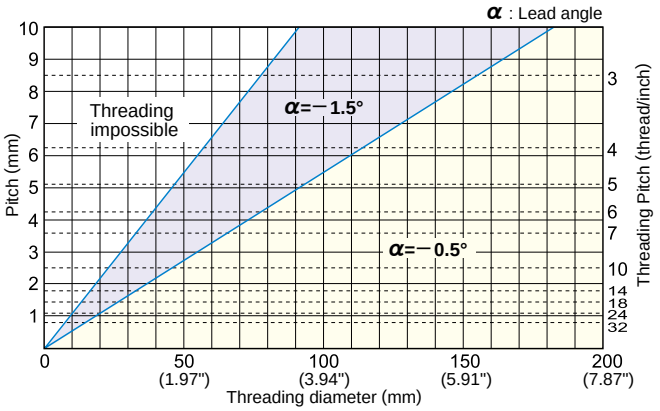
(Note) Back turning in the case of left hand threads.

Shim reference graph (Thread angle 30° and 29°)

Right Hand Thread



Left Hand Thread



Note) When a thread lead angle ≤ the tool flank angle, change the shim to prevent side interference with the insert.
(Refer to the table below for the calculation of thread lead angle and tool flank angle.)

Shim selection table

Lead angle	Threading angle 60°/55° Right Hand Thread		Threading angle 60°/55° Left Hand Thread		Threading angle 30°/29° Right Hand Thread		Threading angle 30°/29° Left Hand Thread	
0	P05	P05	N05	N05	P05	P05	N05	N05
0.5	P05	P05	N05	N05	P05	P05	N05	N05
1	P15	P15	N15	N15	P15	P15	N15	N15
1.5	P15	P15	N15	N15	P15	P15	N15	N15
2	P25	P25	N15	N15	P25	P25	Not Available	Not Available
2.5	P25	P25	Not Available	Not Available	P25	P25	Not Available	Not Available
3	P35	P35	Not Available	Not Available	P35	P35	Not Available	Not Available
3.5	P35	P35	Not Available	Not Available	P35	P35	Not Available	Not Available
4	P45	P45	Not Available	Not Available	P45	P45	Not Available	Not Available
4.5	P45	P45	Not Available	Not Available	P45	P45	Not Available	Not Available
5	P45	P45	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
5.5	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available

(Note) Back turning in the case of left hand threads.

When replacing a shim, check if the difference between the thread lead angle and shim inclination angle is within:2.5 ° - 0.5 ° where thread angle is 60 ° (55 °) 2 ° - 1° where thread angle is 30° (29°)
*** Inclination angle of a standard shim is 0°.**
*** The holder has a 1.5 ° lead angle.**

Calculation of thread lead angle

$$\tan\alpha = \frac{l}{\pi d} = \frac{nP}{\pi d}$$

α : Lead angle
l : Lead
n : Number of thread starts
P : Pitch
d : Pitch diameter of thread

Example of selecting a shim

・When the thread lead angle is 2.2°
①In the case when the thread angle is 60°
(2.2° lead angle) – (2.5° - 0.5°) = –0.3° - 1.7° shim inclination angle is appropriate. Threading with a standard shim (0° inclination angle) is possible. But, replacing with a shim with a 1° inclination angle is recommended, refer to Standard Shim List on pages G012 and G013.
②In the case when the thread angle is 30°
(2.2° lead angle) – (2° - 1°) = 0.2° - 1.2° shim inclination angle is appropriate. Replacing with a shim with a 1° inclination angle is recommended, referring to Standard Shim List on pages G012 and G013.

Relief angle of an insert set on a holder

Thread helix angle	Internal relief angle	External relief angle
60°	8.8°	5.8°
55°	7.9°	5.2°
30°	4.1°	2.7°
29°	4°	2.6°

・Relief angles (β_2, β_1) of an insert become small when the thread helix angle of a trapezoidal, round, or other thread is small. Take care when selecting a shim.

Standard of Depth of Cut (External Threading)

EXTERNAL (RADIAL INFEED)

ISO Metric

(mm)

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts	M-class inserts with 3-D chip breakers
0.5	0.31	0.10	0.08	0.07	0.06											MMT16ER050ISO	–
0.75	0.46	0.16	0.14	0.10	0.06											MMT16ER075ISO	–
1.0	0.61	0.18	0.15	0.12	0.10	0.06										MMT16ER100ISO	MMT16ER100ISO-S
1.25	0.77	0.19	0.17	0.14	0.11	0.10	0.06									MMT16ER125ISO	MMT16ER125ISO-S
1.5	0.92	0.22	0.21	0.17	0.14	0.12	0.06									MMT16ER150ISO	MMT16ER150ISO-S
1.75	1.07	0.22	0.21	0.16	0.13	0.11	0.09	0.09	0.06							MMT16ER175ISO	MMT16ER175ISO-S
2.0	1.23	0.24	0.23	0.17	0.16	0.14	0.12	0.11	0.06							MMT16ER200ISO	MMT16ER200ISO-S
2.5	1.53	0.26	0.23	0.19	0.17	0.15	0.13	0.12	0.11	0.11	0.06					MMT16ER250ISO	MMT16ER250ISO-S
3.0	1.84	0.27	0.25	0.20	0.18	0.16	0.14	0.13	0.12	0.12	0.11	0.10	0.06			MMT16ER300ISO	MMT16ER300ISO-S
3.5	2.15	0.33	0.30	0.24	0.21	0.18	0.17	0.15	0.14	0.14	0.12	0.11	0.06			MMT22ER350ISO	–
4.0	2.45	0.34	0.31	0.24	0.22	0.19	0.17	0.16	0.14	0.14	0.13	0.12	0.12	0.11	0.06	MMT22ER400ISO	–
4.5	2.76	0.38	0.34	0.28	0.24	0.22	0.20	0.18	0.16	0.16	0.15	0.14	0.13	0.12	0.06	MMT22ER450ISO	–
5.0	3.07	0.42	0.38	0.32	0.27	0.24	0.22	0.20	0.18	0.18	0.17	0.16	0.15	0.12	0.06	MMT22ER500ISO	–

American UN

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts	M-class inserts with 3-D chip breakers
32	.019	.007	.006	.004	.002											MMT16ER320UN	–
28	.022	.007	.006	.004	.003	.002										MMT16ER280UN	–
24	.026	.007	.006	.006	.005	.002										MMT16ER240UN	–
20	.031	.008	.007	.005	.005	.004	.002									MMT16ER200UN	–
18	.034	.009	.008	.006	.005	.004	.002									MMT16ER180UN	–
16	.038	.009	.008	.006	.005	.004	.004	.002								MMT16ER160UN	MMT16ER160UN-S
14	.044	.009	.008	.006	.005	.005	.005	.004	.002							MMT16ER140UN	MMT16ER140UN-S
13	.047	.010	.009	.007	.006	.005	.005	.003	.002							MMT16ER130UN	–
12	.051	.011	.009	.007	.006	.006	.005	.005	.002							MMT16ER120UN	MMT16ER120UN-S
11	.056	.011	.009	.007	.006	.006	.006	.005	.004	.002						MMT16ER110UN	–
10	.061	.011	.009	.007	.006	.006	.006	.005	.005	.004	.002					MMT16ER100UN	–
9	.068	.013	.011	.009	.007	.006	.006	.005	.005	.004	.002					MMT16ER090UN	–
8	.077	.014	.012	.009	.007	.006	.006	.006	.006	.005	.004	.002				MMT16ER080UN	–
7	.087	.015	.013	.011	.009	.008	.007	.006	.006	.005	.005	.002				MMT22ER070UN	–
6	.102	.017	.014	.011	.010	.008	.007	.007	.006	.006	.005	.005	.004	.002		MMT22ER060UN	–
5	.123	.017	.015	.012	.011	.009	.009	.008	.007	.007	.007	.007	.006	.006	.002	MMT22ER050UN	–

Whitworth for BSW, BSP

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts	M-class inserts with 3-D chip breakers
28	.023	.007	.006	.004	.004	.002										MMT16ER280W	–
26	.025	.007	.006	.005	.005	.002										MMT16ER260W	–
20	.032	.008	.007	.006	.005	.004	.002									MMT16ER200W	–
19	.034	.008	.007	.006	.006	.005	.002									MMT16ER190W	MMT16ER190W-S
18	.035	.010	.007	.006	.005	.005	.002									MMT16ER180W	–
16	.040	.008	.007	.006	.005	.004	.004	.004	.002							MMT16ER160W	–
14	.046	.009	.008	.007	.006	.005	.005	.004	.002							MMT16ER140W	MMT16ER140W-S
12	.054	.011	.010	.008	.006	.006	.006	.005	.002							MMT16ER120W	–
11	.058	.011	.009	.008	.007	.006	.006	.005	.005	.002						MMT16ER110W	MMT16ER110W-S
10	.064	.011	.010	.008	.007	.006	.006	.005	.005	.004	.002					MMT16ER100W	–
9	.071	.011	.010	.008	.007	.006	.006	.006	.005	.005	.005	.002				MMT16ER090W	–
8	.080	.012	.011	.009	.007	.007	.006	.006	.006	.005	.005	.004	.002			MMT16ER080W	–
7	.091	.013	.013	.010	.009	.008	.007	.007	.006	.006	.006	.004	.002			MMT22ER070W	–
6	.107	.014	.013	.011	.009	.008	.008	.007	.007	.006	.006	.006	.005	.005	.002	MMT22ER060W	–
5	.128	.017	.016	.014	.011	.010	.009	.009	.008	.007	.007	.007	.006	.005	.002	MMT22ER050W	–

(Note) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

Standard of Depth of Cut (External Threading)

EXTERNAL (RADIAL INFEED)

BSPT

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes												Insert Type	
		1	2	3	4	5	6	7	8	9				G-class ground inserts	M-class inserts with 3-D chip breakers
28	.023	.007	.006	.004	.004	.002								MMT16ER280BSPT	–
19	.034	.009	.007	.006	.005	.005	.002							MMT16ER190BSPT	MMT16ER190BSPT-S
14	.046	.009	.008	.007	.006	.005	.005	.004	.002					MMT16ER140BSPT	MMT16ER140BSPT-S
11	.058	.010	.009	.008	.007	.006	.006	.005	.005	.002				MMT16ER110BSPT	MMT16ER110BSPT-S

Round DIN 405

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		G-class ground inserts
10	.050	.009	.008	.008	.007	.006	.005	.005	.002								MMT16ER100RD
8	.063	.009	.008	.008	.007	.007	.006	.006	.005	.005	.002						MMT16ER080RD
6	.083	.010	.010	.009	.009	.008	.007	.007	.006	.006	.005	.004	.002				MMT16ER060RD
4	.125	.013	.013	.013	.012	.011	.010	.009	.009	.008	.007	.007	.006	.005	.002		MMT22ER040RD

ISO Trapezoidal 30°

(mm)

Pitch (mm)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		G-class ground inserts
1.5	0.90	0.23	0.21	0.16	0.13	0.11	0.06										MMT16ER150TR
2.0	1.25	0.29	0.26	0.21	0.17	0.14	0.12	0.06									MMT16ER200TR
3.0	1.75	0.32	0.31	0.24	0.19	0.18	0.17	0.15	0.13	0.06							MMT16ER300TR
4.0	2.25	0.33	0.32	0.24	0.22	0.21	0.17	0.16	0.15	0.14	0.13	0.12	0.06				MMT22ER400TR
5.0	2.75	0.35	0.32	0.26	0.24	0.22	0.21	0.19	0.19	0.17	0.15	0.14	0.13	0.12	0.06		MMT22ER500TR

American ACME

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		G-class ground inserts
12	.047	.011	.009	.008	.007	.006	.004	.002									MMT16ER120ACME
10	.060	.011	.010	.008	.007	.006	.006	.005	.005	.002							MMT16ER100ACME
8	.072	.012	.010	.009	.007	.006	.006	.006	.005	.005	.004	.002					MMT16ER080ACME
6	.093	.013	.012	.011	.009	.008	.007	.006	.006	.005	.005	.004	.005	.002			MMT22ER060ACME
5	.110	.014	.013	.012	.010	.009	.008	.007	.007	.006	.006	.006	.005	.005	.002		MMT22ER050ACME

UNJ

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11					G-class ground inserts
32	.018	.006	.006	.004	.002												MMT16ER320UNJ
28	.020	.006	.005	.004	.003	.002											MMT16ER280UNJ
24	.024	.007	.006	.006	.003	.002											MMT16ER240UNJ
20	.029	.007	.006	.005	.005	.004	.002										MMT16ER200UNJ
18	.032	.009	.007	.006	.004	.004	.002										MMT16ER180UNJ
16	.036	.010	.008	.006	.005	.004	.003										MMT16ER160UNJ
14	.041	.010	.009	.007	.005	.004	.004	.002									MMT16ER140UNJ
12	.048	.011	.011	.008	.007	.005	.004	.002									MMT16ER120UNJ
10	.058	.012	.011	.008	.006	.005	.005	.005	.004	.002							MMT16ER100UNJ
8	.072	.012	.012	.009	.007	.006	.006	.005	.005	.004	.004	.002					MMT16ER080UNJ

API Buttress Casing

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11					G-class ground inserts
5	.061	.010	.009	.007	.006	.005	.005	.005	.004	.004	.004	.002					MMT22ER050APBU

(Note) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

API Round Casing & Tubing

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12				G-class ground inserts
10	.056	.010	.009	.006	.006	.005	.005	.005	.004	.004	.002						MMT16ER100APRD
8	.071	.010	.009	.007	.006	.006	.006	.005	.005	.005	.005	.005	.002				MMT16ER080APRD

American NPT

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	G-class ground inserts
27	.026	.006	.005	.005	.004	.004	.002										MMT16ER270NPT
18	.040	.008	.006	.006	.005	.005	.004	.004	.002								MMT16ER180NPT
14	.052	.009	.007	.006	.006	.005	.005	.004	.004	.004	.002						MMT16ER140NPT
11.5	.065	.009	.007	.007	.006	.006	.005	.005	.005	.005	.004	.004	.002				MMT16ER115NPT
8	.095	.013	.011	.009	.008	.007	.006	.006	.006	.005	.005	.005	.004	.004	.004	.002	MMT16ER080NPT

American NPTF

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	G-class ground inserts
27	.025	.006	.006	.004	.004	.003	.002										MMT16ER270NPTF
18	.039	.007	.006	.006	.005	.005	.004	.004	.002								MMT16ER180NPTF
14	.053	.009	.008	.006	.006	.005	.005	.004	.004	.004	.002						MMT16ER140NPTF
11.5	.064	.009	.009	.007	.006	.005	.005	.005	.004	.004	.004	.004	.002				MMT16ER115NPTF
8	.094	.013	.011	.009	.007	.007	.006	.006	.006	.005	.005	.005	.004	.004	.004	.002	MMT16ER080NPTF

(Note) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

Standard of Depth of Cut (Internal Threading)

INTERNAL (RADIAL INFEED)

ISO Metric

(mm)

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts		M-class inserts with 3-D chip breakers	
0.5	0.29	0.09	0.07	0.07	0.06											MMT11IR050ISO	MMT16IR050ISO	–	–
0.75	0.43	0.15	0.13	0.09	0.06											MMT11IR075ISO	MMT16IR075ISO	–	–
1.0	0.58	0.17	0.15	0.11	0.09	0.06										MMT11IR100ISO	MMT16IR100ISO	MMT11IR100ISO-S	MMT16IR100ISO-S
1.25	0.72	0.18	0.16	0.12	0.11	0.09	0.06									MMT11IR125ISO	MMT16IR125ISO	MMT11IR125ISO-S	MMT16IR125ISO-S
1.5	0.87	0.21	0.20	0.16	0.13	0.11	0.06									MMT11IR150ISO	MMT16IR150ISO	MMT11IR150ISO-S	MMT16IR150ISO-S
1.75	1.01	0.21	0.20	0.15	0.12	0.10	0.09	0.08	0.06							MMT11IR175ISO	MMT16IR175ISO	–	MMT16IR175ISO-S
2.0	1.15	0.24	0.22	0.18	0.14	0.12	0.10	0.09	0.06							MMT11IR200ISO	MMT16IR200ISO	–	MMT16IR200ISO-S
2.5	1.44	0.25	0.24	0.21	0.15	0.13	0.12	0.10	0.09	0.09	0.06					–	MMT16IR250ISO	–	MMT16IR250ISO-S
3.0	1.73	0.26	0.25	0.22	0.17	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.06			–	MMT16IR300ISO	–	MMT16IR300ISO-S
3.5	2.02	0.32	0.30	0.23	0.19	0.17	0.15	0.14	0.13	0.12	0.11	0.10	0.06			–	MMT22IR350ISO	–	–
4.0	2.31	0.33	0.31	0.24	0.22	0.18	0.15	0.14	0.13	0.12	0.12	0.11	0.10	0.10	0.06	–	MMT22IR400ISO	–	–
4.5	2.60	0.36	0.33	0.28	0.24	0.21	0.19	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.06	–	MMT22IR450ISO	–	–
5.0	2.89	0.41	0.38	0.32	0.27	0.24	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.06	–	MMT22IR500ISO	–	–

American UN

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts		M-class inserts with 3-D chip breakers
32	.018	.006	.006	.004	.002											MMT11IR320UN	MMT16IR320UN	–
28	.020	.006	.005	.004	.003	.002										MMT11IR280UN	MMT16IR280UN	–
24	.024	.007	.006	.005	.004	.002										MMT11IR240UN	MMT16IR240UN	–
20	.029	.007	.006	.005	.005	.004	.002									MMT11IR200UN	MMT16IR200UN	–
18	.032	.008	.007	.006	.005	.004	.002									MMT11IR180UN	MMT16IR180UN	–
16	.036	.008	.007	.006	.005	.004	.004	.002								MMT11IR160UN	MMT16IR160UN	MMT16IR160UN-S
14	.041	.008	.007	.006	.005	.005	.004	.004	.002							MMT11IR140UN	MMT16IR140UN	MMT16IR140UN-S
13	.044	.009	.007	.006	.006	.005	.005	.004	.002							–	MMT16IR130UN	–
12	.048	.009	.009	.007	.006	.005	.005	.005	.002							–	MMT16IR120UN	MMT16IR120UN-S
11	.052	.009	.009	.008	.006	.005	.005	.004	.004	.002						–	MMT16IR110UN	–
10	.058	.010	.009	.008	.006	.005	.005	.005	.004	.004	.002					–	MMT16IR100UN	–
9	.064	.012	.009	.008	.007	.006	.006	.005	.005	.004	.002					–	MMT16IR090UN	–
8	.072	.012	.010	.008	.007	.006	.006	.006	.005	.005	.005	.002				–	MMT16IR080UN	–
7	.082	.014	.012	.009	.008	.007	.007	.006	.006	.006	.005	.002				–	MMT22IR070UN	–
6	.096	.016	.013	.010	.009	.007	.007	.006	.006	.006	.005	.005	.004	.002		–	MMT22IR060UN	–
5	.115	.016	.014	.012	.010	.009	.008	.008	.007	.007	.006	.006	.005	.005	.002	–	MMT22IR050UN	–

Whitworth for BSW, BSP

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts		M-class inserts with 3-D chip breakers
28	.023	.007	.006	.004	.004	.002										–	MMT16IR280W	–
26	.025	.007	.006	.005	.005	.002										–	MMT16IR260W	–
20	.032	.008	.007	.006	.005	.004	.002									–	MMT16IR200W	–
19	.034	.008	.007	.006	.006	.005	.002									MMT11IR190W	MMT16IR190W	MMT16IR190W-S
18	.035	.010	.007	.006	.005	.005	.002									–	MMT16IR180W	–
16	.040	.008	.007	.006	.005	.004	.004	.004	.002							–	MMT16IR160W	–
14	.046	.009	.008	.007	.006	.005	.005	.004	.002							MMT11IR140W	MMT16IR140W	MMT16IR140W-S
12	.054	.011	.010	.008	.006	.006	.006	.005	.002							–	MMT16IR120W	MMT16IR120W-S
11	.058	.011	.009	.008	.007	.006	.006	.005	.004	.002						–	MMT16IR110W	–
10	.064	.011	.010	.008	.007	.006	.006	.005	.005	.004	.002					–	MMT16IR100W	–
9	.071	.011	.010	.008	.007	.006	.006	.006	.005	.005	.005	.002				–	MMT16IR090W	–
8	.080	.012	.011	.009	.007	.007	.006	.006	.006	.005	.005	.004	.002			–	MMT16IR080W	–
7	.091	.013	.013	.010	.009	.008	.007	.007	.006	.006	.006	.004	.002			–	MMT22IR070W	–
6	.107	.014	.013	.011	.009	.008	.008	.007	.007	.006	.006	.006	.005	.005	.002	–	MMT22IR060W	–
5	.128	.017	.016	.014	.011	.010	.009	.009	.008	.007	.007	.007	.006	.005	.002	–	MMT22IR050W	–

(Note) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

BSPT

(inch)

Pitch (thread/inch)	Total Cutting Depth	Number of Passes									Insert Type		
		1	2	3	4	5	6	7	8	9	G-class ground inserts		M-class inserts with 3-D chip breakers
19	.034	.009	.007	.006	.005	.005	.002				MMT11IR190BSPT	MMT16IR190BSPT	MMT16IR190BSPT-S
14	.046	.009	.008	.007	.006	.005	.005	.004	.002		MMT11IR140BSPT	MMT16IR140BSPT	MMT16IR140BSPT-S
11	.058	.010	.009	.008	.007	.006	.006	.005	.005	.002	–	MMT16IR110BSPT	MMT16IR110BSPT-S

Round DIN 405

(inch)

Pitch (thread/inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts
10	.050	.009	.008	.008	.007	.006	.005	.005	.002							MMT16IR100RD
8	.063	.009	.008	.008	.007	.007	.006	.006	.005	.005	.002					MMT16IR080RD
6	.083	.010	.010	.009	.009	.008	.007	.007	.006	.006	.005	.004	.002			MMT16IR060RD
4	.125	.013	.013	.013	.012	.011	.010	.009	.009	.008	.007	.007	.006	.005	.002	MMT22IR040RD

ISO Trapezoidal 30°

(mm)

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts
1.5	0.90	0.23	0.21	0.16	0.13	0.11	0.06									MMT16IR150TR
2	1.25	0.29	0.26	0.21	0.17	0.14	0.12	0.06								MMT16IR200TR
3	1.75	0.32	0.31	0.24	0.19	0.18	0.17	0.15	0.13	0.06						MMT16IR300TR
4	2.25	0.33	0.32	0.24	0.22	0.21	0.17	0.16	0.15	0.14	0.13	0.12	0.06			MMT22IR400TR
5	2.75	0.35	0.32	0.26	0.24	0.22	0.21	0.19	0.19	0.17	0.15	0.14	0.13	0.12	0.06	MMT22IR500TR

American ACME

(inch)

Pitch (thread/inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts
12	.047	.011	.009	.008	.007	.006	.004	.002								MMT16IR120ACME
10	.060	.011	.010	.008	.007	.006	.006	.005	.005	.002						MMT16IR100ACME
8	.072	.012	.010	.009	.007	.006	.006	.006	.005	.005	.004	.002				MMT16IR080ACME
6	.093	.013	.012	.011	.009	.008	.007	.006	.006	.005	.005	.005	.004	.002		MMT22IR060ACME
5	.110	.014	.013	.012	.010	.009	.008	.007	.007	.006	.006	.006	.005	.005	.002	MMT22IR050ACME

API Buttress Casing

(inch)

Pitch (thread/inch)	Total Cutting Depth	Number of Passes											Insert Type
		1	2	3	4	5	6	7	8	9	10	11	G-class ground inserts
5	.061	.010	.009	.007	.006	.005	.005	.005	.004	.004	.004	.002	MMT22IR050APBU

API Round Casing & Tubing

(inch)

Pitch (thread/inch)	Total Cutting Depth	Number of Passes												Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	G-class ground inserts
10	.056	.010	.009	.006	.006	.005	.005	.005	.004	.004	.002			MMT16IR100APRD
8	.071	.010	.009	.007	.006	.006	.006	.005	.005	.005	.005	.005	.002	MMT16IR080APRD

(Note) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

Standard of Depth of Cut (Internal Threading)

INTERNAL (RADIAL INFEED)

American NPT

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	G-class ground inserts
27	.026	.006	.005	.005	.004	.004	.002										MMT16IR270NPT
18	.040	.008	.006	.006	.005	.005	.004	.004	.002								MMT16IR180NPT
14	.052	.009	.007	.006	.006	.005	.005	.004	.004	.004	.002						MMT16IR140NPT
11.5	.065	.009	.007	.007	.006	.006	.005	.005	.005	.005	.004	.004	.002				MMT16IR115NPT
8	.095	.013	.011	.009	.008	.007	.006	.006	.006	.005	.005	.005	.004	.004	.004	.002	MMT16IR080NPT

American NPTF

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	G-class ground inserts
14	.053	.009	.008	.006	.006	.005	.005	.004	.004	.004	.002						MMT16IR140NPTF
11.5	.064	.009	.009	.007	.006	.005	.005	.005	.004	.004	.004	.004	.002				MMT16IR115NPTF
8	.094	.013	.011	.009	.007	.007	.006	.006	.006	.005	.005	.005	.004	.004	.004	.002	MMT16IR080NPTF

(Note) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

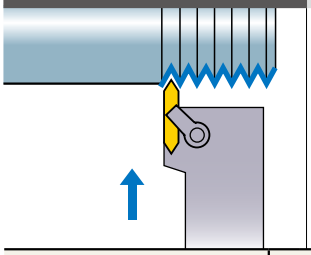
TROUBLE SHOOTING

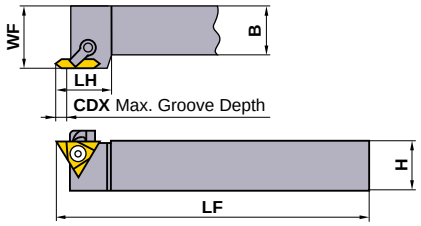
Problems	Observation	Causes	Solutions
Low thread precision.	Threads do not mesh with each other.	Incorrect tool installation.	Set the insert center height at 0".
			Check holder inclination (Lateral).
	Shallow thread.	Incorrect depth of cut.	Modify the depth of cut.
		Lack of insert wear or plastic deformation resistance.	Refer to "Quickly generated flank wear." and "Large plastic deformation." below.
Poor surface finish.	Surface damage.	Chips wrap around or clog the work pieces.	Change to flank infeed and control the chip discharge direction.
			Change to an M-class insert with a 3-D chip breaker.
		The side of the insert cutting edge interferes with the workpiece.	Check the lead angle and select an appropriate shim.
	Surface tears.	Built-up edge (Welding).	Increase cutting speed.
			Increase coolant pressure and volume.
		Cutting resistance too high.	Decrease depth of cut per pass.
	Surface vibrations.	Cutting speed too high.	Decrease the cutting speed.
		Insufficient work piece or tool clamping.	Re-check work piece and tool clamping. (Chuck pressure, clamping allowance)
		Incorrect tool installation.	Set the insert center height at 0".
Short tool life.	Flank wear quickly generated.	Cutting speed too high.	Decrease the cutting speed.
		Too many passes causes abrasive wear.	Reduce the number of passes.
		Small depth of cut for the finishing pass.	Do not re-cut at 0" depth of cut. Depth of cut larger than .002" is recommended.
	Non-uniform wear of the right and left sides of the cutting edge.	The work piece lead angle and the tool lead angle do not match.	Check the work piece lead angle and select an appropriate shim.
	Chipping and fracture.	Cutting speed too low.	Increase cutting speed.
		Cutting resistance too high.	Increase the number of passes and decrease the cutting resistance per pass.
		Unstable clamping.	Check work piece deflection.
			Shorten tool overhang.
			Recheck work piece and tool clamping. (Chuck pressure, clamping allowance)
		Chip packing.	Increase coolant pressure to blow away chips.
			Change the tool pass to control chips. (Lengthen each pass to allow the coolant to clear the chips.
			Change from standard internal cutting to back turning to prevent chip jamming.
		Non-chamfered work pieces causes high resistance at the start of each pass.	Chamfer the workpiece entry and exit faces .
	Large plastic deformation.	High cutting speed and large heat generation.	Decrease the cutting speed.
		Lack of coolant supply.	Check coolant is supply is sufficient.
			Increase coolant pressure and volume.
		Cutting resistance too high.	Increase the number of passes and decrease the cutting resistance per pass.

MTVO HOLDER

- Multi-clamp type.
- Precision class insert.
- Positive insert produces a good finished surface.
- Holder is capable of performing both grooving and threading.
- Economical due to the use of 3 cutting edges.

MTVO External grooving, Threading



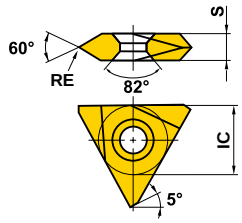


Right hand tool holder shown.

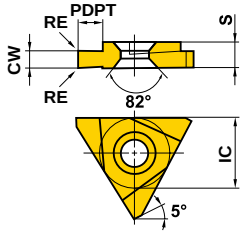
Order Number	Stock		Insert Number		Dimensions (inch)								
	R	L			H	B	LF	LH	WF	CDX	Insert Screw	Clamp Screw	Clamp
MTVOR/L-8-3B	●	●	TNMC	32	.500	.500	4.500	1.000	.750	.057 / .156	GTS1	XNS35	CL6
MTVOR/L-**10-3B**	●	●		32	.625	.625	4.500	1.000	.875	.057 / .156	GTS1	XNS35	CL6
MTVOR/L-**12-3B**	●	●		32	.750	.750	4.500	1.000	1.000	.057 / .156	GTS1	XNS35	CL6
MTVOR/L-**12-4B**	●	●		43	.750	.750	4.500	1.063	1.000	.156 / .234	GTS2	XNS36	CL6
MTVOR/L-**16-4D**	●	●		43	1.000	1.000	6.000	1.063	1.250	.156 / .234	GTS2	XNS36	CL6
MTVOR/L-**16-5D**	●	●		54	1.000	1.000	6.000	1.250	1.250	.297	GTS3	XNS36	CL6
MTVOR/L-**20-4D**	●	●		43	1.250	1.250	6.000	1.063	1.500	.156 / .234	GTS2	XNS36	CL6

(Note) Please use right hand insert for right hand holder and left hand insert for left hand holder.

INSERTS (THREADING)

Order Number	Class	Stock		Min. Pitch (T.P.I)	Dimensions (inch)			Geometry
		Coated	Carbide		IC	S	RE	
		UP20M	UTi20T					
TNMC32NV	E	●	●	8	.375	.125	.004	
TNMC**43NV**	E	●	●	6	.500	.187	.004	
TNMC**54NV**	E	●	●	4	.625	.250	.004	

INSERTS (GROOVING)

Order Number	Class	Stock		Dimensions (inch)					Geometry
		Coated	Carbide	CW	IC	S	PDPT	RE	
		UP20M	UTi20T						
TNMC32NGR032	E	●	●	.032	.375	.125	.057	≤.003	
TNMC**32NGL032**	E	●	●	.032	.375	.125	.057	≤.003	
TNMC**32NGR063**	E	●	●	.063	.375	.125	.156	≤.003	
TNMC**32NGL063**	E	●	●	.063	.375	.125	.156	≤.003	
TNMC**43NGR063**	E	●	●	.063	.500	.188	.156	≤.003	
TNMC**43NGL063**	E	●	●	.063	.500	.188	.156	≤.003	
TNMC**43NGR094**	E	●	●	.094	.500	.188	.156	≤.003	
TNMC**43NGL094**	E	●	●	.094	.500	.188	.156	≤.003	
TNMC**43NGR125**	E	●	●	.125	.500	.188	.234	≤.003	
TNMC**43NGL125**	E	●	●	.125	.500	.188	.234	≤.003	
TNMC**43NGR156**	E	●	●	.156	.500	.188	.234	≤.003	
TNMC**43NGL156**	E	●	●	.156	.500	.188	.234	≤.003	
TNMC**54NGR187**	E	●	●	.187	.625	.250	.297	≤.003	
TNMC**54NGL187**	E	●	●	.187	.625	.250	.297	≤.003	

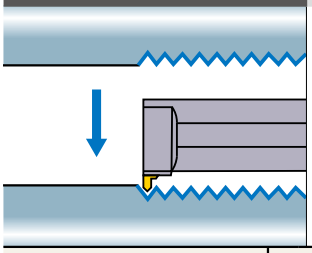
Right hand insert shown.

● : Inventory maintained.

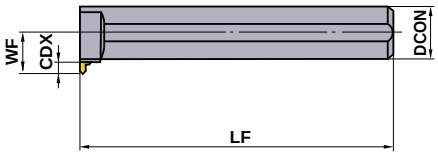
STHN/O TYPE

- Multi-clamp type.
- Precision class insert.
- Positive insert produces a good finished surface.
- Holder is capable of performing both grooving and threading.
- Economical due to the use of 3 cutting edges.

S-STHN/O Internal grooving, Threading, Boring





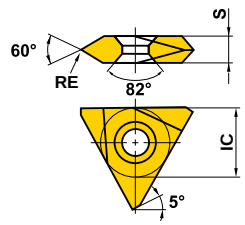


Right hand tool holder shown.

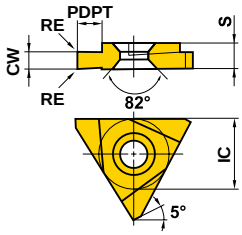
Order Number	Stock		Insert Number		Dimensions (inch)							
	R	L			DCON	LF	WF	GAMF	DMIN	CDX	Clamp Screw	Wrench
S16-STHNR/L-3	●	●	TNMC	32○	1.000	10.000	.656	10°	**1.250**	.060 / .156	GTS1	TKY10F
S20-STHNR/L-4	●	●		43○	1.250	12.000	.843	10°	**1.750**	.156 / .234	GTS2	TKY20F
S24-STHNR/L-4	●	●		43○	1.500	14.000	.968	10°	**2.250**	.156 / .234	GTS2	TKY20F
S32-STHNR/L-4	●	●		43○	2.000	14.000	1.218	10°	**3.000**	.156 / .234	GTS2	TKY20F
S32-STHOR/L-5	●	●		54○	2.000	14.000	1.250	0	**4.000**	.297	GTS3	TKY20F

(Note) Please use left hand insert for right hand holder and right hand insert for left hand holder.

INSERTS (THREADING)

Order Number	Class	Stock		Min. Pitch (T.P.I)	Dimensions (inch)			Geometry
		Coated	Carbide		IC	S	RE	
		UP20M	UTi20T					
TNMC32NV	E	●	●	8	.375	.125	.004	
TNMC**43NV**	E	●	●	6	.500	.187	.004	
TNMC**54NV**	E	●	●	4	.625	.250	.004	

INSERTS (GROOVING)

Order Number	Class	Stock		Dimensions (inch)					Geometry
		Coated	Carbide	CW	IC	S	PDPT	RE	
		UP20M	UTi20T						
TNMC32NGR032	E	●	●	.032	.375	.125	.057	≤.003	
TNMC**32NGL032**	E	●	●	.032	.375	.125	.057	≤.003	
TNMC**32NGR063**	E	●	●	.063	.375	.125	.156	≤.003	
TNMC**32NGL063**	E	●	●	.063	.375	.125	.156	≤.003	
TNMC**43NGR063**	E	●	●	.063	.500	.188	.156	≤.003	
TNMC**43NGL063**	E	●	●	.063	.500	.188	.156	≤.003	
TNMC**43NGR094**	E	●	●	.094	.500	.188	.156	≤.003	
TNMC**43NGL094**	E	●	●	.094	.500	.188	.156	≤.003	
TNMC**43NGR125**	E	●	●	.125	.500	.188	.234	≤.003	
TNMC**43NGL125**	E	●	●	.125	.500	.188	.234	≤.003	
TNMC**43NGR156**	E	●	●	.156	.500	.188	.234	≤.003	
TNMC**43NGL156**	E	●	●	.156	.500	.188	.234	≤.003	
TNMC**54NGR187**	E	●	●	.187	.625	.250	.297	≤.003	
TNMC**54NGL187**	E	●	●	.187	.625	.250	.297	≤.003	

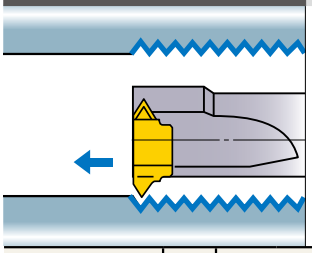
Right hand insert shown.

THREADING

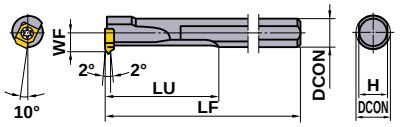
F TYPE

- Min. cutting diameter 10mm.
- Screw-on type.
- Usable for various applications.
- Max. groove depth: 3mm.

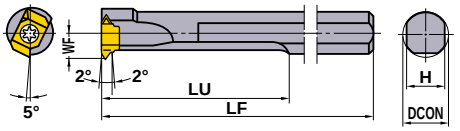
FSL51 Internal grooving, Threading



1 Corner type (FSL5108R,5110R)



2 Corner type (FSL5112R,5114R,5116R)



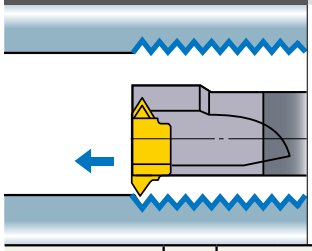
Metric Standard

Right hand tool holder only.

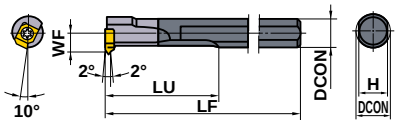
Order Number	Stock	Insert Number				Dimensions (mm)							Max. Groove Depth (mm)	Clamp Screw	Wrench
	R	Grooving		Threading		DCON	H	LF	LU	WF	CW★2	DMIN★1			
FSL5108R	★	MLG	10□□L	MLT	1001L	8	7	125	30	4.8	1.2 1.5 2.0	**10**	1.0	TS25	TKY08F
FSL5110R	★	MLG	10□□L	MLT	1001L	10	9	150	40	5.8	1.5 2.0	**12**	1.0	TS25	TKY08F
FSL5112R	★	MLG	14□□L	MLT	1401L	12	10.8	180	50	6.8	1.5 2.0 3.0	**14**	2.0	TS32	TKY08F
FSL5114R	★	MLG	14□□L	MLT	1401L	14	12.4	180	60	7.8		**16**	2.0	TS32	TKY08F
FSL5116R	★	MLG	20□□L	MLT	2001L	16	14	200	70	9.7	2.0 3.0 4.0	**20**	3.0	TS43	TKY15F

★1 DMIN : Min. Cutting Diameter
★2 CW : Please refer to page G038.

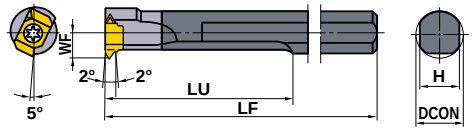
FSL52 Carbide shank



1 Corner type (FSL5208R,5210R)



2 Corner type (FSL5212R,5214R,5216R)



Metric Standard

Right hand tool holder only.

Order Number	Stock	Insert Number				Dimensions (mm)							Max. Groove Depth (mm)	Clamp Screw	Wrench
	R	Grooving		Threading		DCON	H	LF	LU	WF	CW★2	DMIN★1			
FSL5208R	★	MLG	10□□L	MLT	1001L	8	7	125	60	4.8	1.2 1.5 2.0	**10**	1.0	TS25	TKY08F
FSL5210R	★	MLG	10□□L	MLT	1001L	10	9	150	70	5.8		**12**	1.0	TS25	TKY08F
FSL5212R	★	MLG	14□□L	MLT	1401L	12	10.8	180	80	6.8	1.5 2.0 3.0	**14**	2.0	TS32	TKY08F
FSL5214R	★	MLG	14□□L	MLT	1401L	14	12.4	180	85	7.8		**16**	2.0	TS32	TKY08F
FSL5216R	★	MLG	20□□L	MLT	2001L	16	14	200	115	9.7	2.0 3.0 4.0	**20**	3.0	TS43	TKY15F

★1 DMIN : Min. Cutting Diameter
★2 CW : Please refer to page G038.

RECOMMENDED CUTTING CONDITIONS

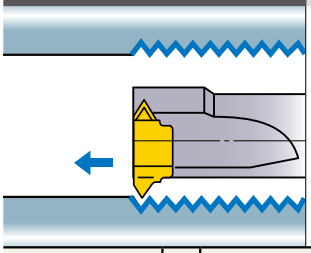
Work Material		Hardness	Grade	Cutting Speed (SFM)	Feed (inch/rev)
P	Carbon Steel Alloy Steel	180—280HB	**UP20M ▪ UTi20T**	295 (195—390)	.002 (.0008—.003)
		280—350HB	**UP20M ▪ UTi20T**	260 (165—330)	.001 (.0008—.0015)

● : Inventory maintained. ★ : Inventory maintained in Japan.

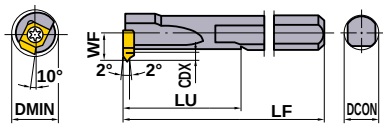
F TYPE

- Min. cutting diameter .390inch.
- Screw-on type.
- Usable for various applications.
- Max. groove depth: .118inch.

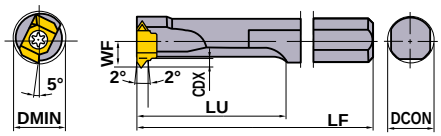
S-SL5N — Internal grooving, Threading



1 Corner type (S-SL5NR05 / 06)



2 Corner type (S-SL5NR08 / 10 / 12)



Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (inch)								
	R	Grooving	Threading	DCON	LF	LU	WF	CW*2	DMIN*1	CDX	Clamp Screw	Wrench
S-SL5NR05	●	MLG10W○○○L	MLT1001L	.313	5.000	1.250	.188	.062 .094	.390	.039	TS25	TKY08F
S-SL5NR06	●	MLG10W○○○L	MLT1001L	.375	6.000	1.500	.219		.449	.039	TS25	TKY08F
S-SL5NR08	●	MLG14W○○○L	MLT1401L	.500	7.000	2.000	.281	.062 .094 .125	.579	.079	TS32	TKY08F
S-SL5NR10	●	MLG20W○○○L	MLT2001L	.625	8.000	3.000	.375	.094 .125 .156	.791	.118	TS43	TKY15F
S-SL5NR12	●	MLG20W○○○L	MLT2001L	.750	10.000	4.000	.438		.902	.118	TS43	TKY15F

*1 DMIN : Min. Cutting Diameter
*2 CW : Please refer to page G038.

RECOMMENDED CUTTING CONDITIONS

Work Material		Hardness	Grade	Cutting Speed (SFM)	Feed (inch/rev)
P	Carbon Steel Alloy Steel	180—280HB	**UP20M ▪ UTi20T**	295 (195—390)	.002 (.0008—.003)
		280—350HB	**UP20M ▪ UTi20T**	260 (165—330)	.001 (.0008—.0015)

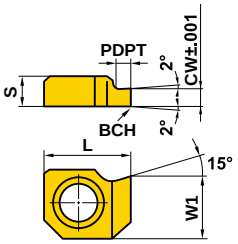
INSERTS ➤ G038
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

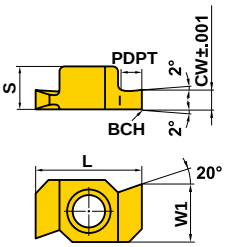
F TYPE

- Min. cutting diameter .390inch.
- Screw-on type.
- Usable for various applications.
- Max. groove depth: .118inch.

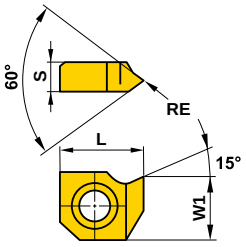
INSERTS

Application		CW (inch)	Order Number	Carbide UTi20T	Carbide HTi10	L	W1	PDPT	S	BCH	Geometry
Grooving	Inch	.062	**MLG10W062L**		●	.276	.197	.039	.094	.004	**MLG...L (1 Corner type)**
	Metric	.047 (1.2mm)	**MLG1012L**	●		.276	.197	.039	.094	.004	
		.059 (1.5mm)	**MLG1015L**	●		.276	.197	.039	.094	.004	
		.079 (2.0mm)	**MLG1020L**	●		.276	.197	.039	.094	.004	
	Inch	.062	**MLG14W062L**		▲	.465	.256	.079	.187	.004	**MLG...L (2 Corner type)**
	Metric	.059 (1.5mm)	**MLG1415L**	●		.465	.256	.079	.187	.004	
		.079 (2.0mm)	**MLG1420L**	●		.465	.256	.079	.187	.004	
		.118 (3.0mm)	**MLG1430L**	●		.465	.256	.079	.187	.004	
		.079 (2.0mm)	**MLG2020L**	●		.661	.356	.118	.250	.004	
		.118 (3.0mm)	**MLG2030L**	●		.661	.356	.118	.250	.004	
		.157 (4.0mm)	**MLG2040L**	●		.661	.356	.118	.250	.004	





Application	Min.Pitch	Order Number	Coated UP20M	Carbide UTi20T	L	W1	S	RE	Geometry
Threading	13T.P.I	**MLT1001L**	●	●	.276	.197	.094	.004	**MLT1001L (1 Corner type)**
	11T.P.I	**MLT1401L**	●	●	.465	.256	.187	.004	
	8T.P.I	**MLT2001L**	●	●	.661	.356	.250	.004	



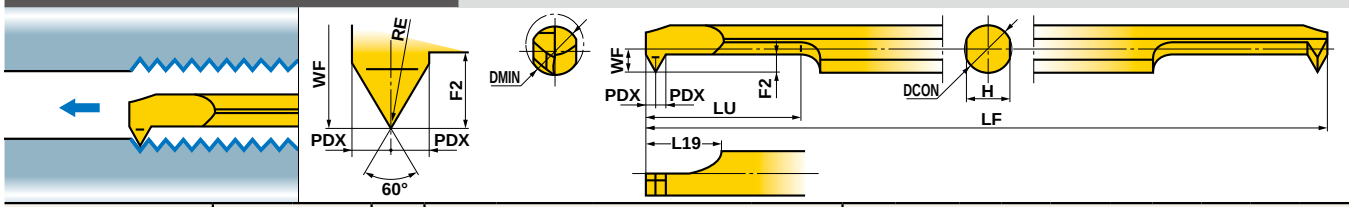
MLT1401L /2001L (2 Corner type)

● : Inventory maintained.
▲ : This item to be discontinued within two years.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

MICRO-MINI TWIN

CT — Internal threading



Order Number	Stock		Breaker	Threads				Dimensions (mm)									
	Micro Grain Carbide	Coated		Metric Screw		Unified Screw											
	TF15	VP15TF		Thread	Pitch (mm)	Thread	Pitch (thread/inch)	DMIN	RE	DCON	LF	LU	L19	WF	PDX	F2	H
CT0305RS-M4	●	●	Without	≧M4	0.5–1.0	≧NO.8–32UNC ≧NO.8–36UNF	36–24	3	0.03	3	50	5.2	6	1.3	0.6	1.2	2.7
CT03RS-M4	●	●	Without	≧M4	0.5–1.0		36–24	3	0.03	3	50	10.2	6	1.3	0.6	1.2	2.7
CT03RS-M4B	●	●	With	≧M4	0.5–1.0		36–24	3	0.03	3	50	10.2	6	1.3	0.6	1.2	2.7
CT0407RS-M6	●	●	Without	≧M6	0.75–1.25	≧1/4–20UNC ≧1/4–28UNF	28–20	4.5	0.05	4	60	7.6	7	1.8	0.8	1.7	3.6
CT04RS-M6	●	●	Without	≧M6	0.75–1.25		28–20	4.5	0.05	4	60	15.6	7	1.8	0.8	1.7	3.6
CT04RS-M6B	●	●	With	≧M6	0.75–1.25		28–20	4.5	0.05	4	60	15.6	7	1.8	0.8	1.7	3.6
CT0511RS-M8	●	●	Without	≧M8	0.75–1.5	≧5/16–18UNC ≧5/16–24UNF	24–18	6	0.05	5	70	11	8	2.3	1	2.2	4.5
CT05RS-M8	●	●	Without	≧M8	0.75–1.5		24–18	6	0.05	5	70	21	8	2.3	1	2.2	4.5
CT05RS-M8B	●	●	With	≧M8	0.75–1.5		24–18	6	0.05	5	70	21	8	2.3	1	2.2	4.5
CT0611RS-M10	●	●	Without	≧M10	0.75–1.75	≧3/8–16UNC ≧3/8–24UNF	24–16	7	0.05	6	75	11	8	2.8	1	2.2	5.4
CT06RS-M10	●	●	Without	≧M10	0.75–1.75		24–16	7	0.05	6	75	21	8	2.8	1	2.2	5.4
CT06RS-M10B	●	●	With	≧M10	0.75–1.75		24–16	7	0.05	6	75	21	8	2.8	1	2.2	5.4

THREAD PITCH FOR THE CT TYPE

Order Number	Metric Thread P (mm)								Unified Thread P (thread/inch)						
	0.50	0.70	0.75	0.80	1.00	1.25	1.50	1.75	36	32	28	24	20	18	16
CT03RS-M4/M4B	○	○	○	○	○	–	–	–	○	○	○	○	–	–	–
CT04RS-M6/M6B	–	–	○	–	○	○	–	–	–	–	○	○	○	–	–
CT05RS-M8/M8B	–	–	○	–	○	○	○	–	–	–	–	○	○	○	–
CT06RS-M10/M10B	–	–	○	–	○	○	○	○	–	–	–	○	○	○	○

(Note) For internal threads that are larger than the minimum diameter of the Micro Mini Twin (CT type) it is possible to machining the above thread pitches. For the minimum diameter please refer to the standards.

DEPTH OF CUT FOR THE CT TYPE

●Metric Thread

P (pitch)		0.5	0.7	0.75		0.8	1		1.25	1.5	1.75
D.O.C. (mm)		0.3	0.43	0.46	0.44	0.49	0.62	0.6	0.76	0.92	1.09
Re* (Corner radius)		0.03	0.03	0.03	0.05	0.03	0.03	0.05	0.05	0.05	0.05
Number of Passes	1	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07
	2	0.05	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07
	3	0.05	0.06	0.06	0.05	0.06	0.06	0.06	0.07	0.07	0.07
	4	0.04	0.05	0.05	0.05	0.05	0.06	0.06	0.07	0.07	0.07
	5	0.04	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.07	0.07
	6	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.06	0.06	0.07
	7	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.06	0.06	0.06
	8		0.04	0.04	0.03	0.04	0.04	0.04	0.05	0.06	0.06
	9		0.03	0.03	0.03	0.03	0.04	0.04	0.05	0.05	0.06
	10			0.03	0.03	0.03	0.04	0.04	0.05	0.05	0.06
	11					0.03	0.03	0.03	0.04	0.05	0.05
	12						0.03	0.03	0.04	0.05	0.05
	13						0.03		0.04	0.04	0.05
	14								0.03	0.04	0.05
	15									0.04	0.04
	16									0.04	0.04
	17									0.03	0.04
	18										0.04
	19										0.04
	20										0.03

●Unified Thread

P (thread/inch)		36	32	28		24		20	18	16
D.O.C. (inch)		.0169	.0193	.0220	.0213	.0260	.0252	.0307	.0343	.0386
Re* (Corner radius)		.0012	.0012	.0012	.0020	.0012	.0020	.0020	.0020	.0020
Number of Passes	1	.0024	.0024	.0028	.0024	.0028	.0028	.0028	.0028	.0028
	2	.0024	.0024	.0024	.0024	.0028	.0028	.0028	.0028	.0028
	3	.0024	.0024	.0024	.0024	.0024	.0024	.0028	.0028	.0028
	4	.0020	.0020	.0024	.0020	.0024	.0024	.0024	.0028	.0028
	5	.0020	.0020	.0020	.0020	.0024	.0024	.0024	.0028	.0028
	6	.0016	.0016	.0020	.0020	.0020	.0020	.0024	.0024	.0024
	7	.0016	.0016	.0016	.0016	.0020	.0020	.0024	.0024	.0024
	8	.0016	.0016	.0016	.0016	.0016	.0020	.0020	.0024	.0024
	9	.0012	.0012	.0016	.0016	.0016	.0016	.0020	.0020	.0024
	10		.0012	.0012	.0012	.0016	.0016	.0020	.0020	.0024
	11		.0012	.0012	.0012	.0012	.0012	.0016	.0020	.0020
	12			.0012	.0012	.0012	.0012	.0016	.0020	.0020
	13					.0012	.0012	.0016	.0016	.0020
	14					.0012		.0012	.0016	.0016
	15							.0012	.0012	.0016
	16								.0012	.0016
	17									.0012
	18									.0012
	19									
	20									

* Even though the pitch maybe the same, the depth of cut varies according to the corner radius. For the Micro Mini Twin CT type CT03RS-M4, and CT03RS-M4B the corner radius is 0.03mm(.0012inch), for other types it is 0.05mm(.0020inch). For further details please refer to the standards section.

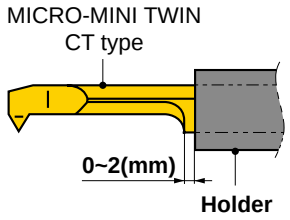
HOLDER

HOLDER CROSS REFERENCE LIST OF INCH SHANK STANDARD

Holder			MICRO-MINI TWIN	Machine Makers
Type		Order Number	CT	
Round Type Holder ϕ.625inch	ID : Metric Type	**RBH10189A**	0305RS-M4, 03RS-M4(B)	Citizen Precision Machinery Co., Ltd. NC lathes
		RBH**10252A**	0407RS-M6, 04RS-M6(B)	
		RBH**10315A**	0511RS-M8, 05RS-M8(B)	
		RBH**10378A**	0611RS-M10, 06RS-M10(B)	
		RBH**10441A**	—	
Round Type Holder ϕ.750inch	ID : Metric Type	**RBH19030N**	0305RS-M4, 03RS-M4(B)	Citizen Precision Machinery Co., Ltd.
		RBH**19040N**	0407RS-M6, 04RS-M6(B)	
		RBH**19050N**	0511RS-M8, 05RS-M8(B)	
		RBH**19060N**	0611RS-M10, 06RS-M10(B)	
		RBH**19070N**	—	
Round Type Holder ϕ1.000inch	ID : Metric Type	**RBH16189A**	0305RS-M4, 03RS-M4(B)	Citizen Precision Machinery Co., Ltd. NC lathes
		RBH**16252A**	0407RS-M6, 04RS-M6(B)	
		RBH**16315A**	0511RS-M8, 05RS-M8(B)	
		RBH**16378A**	0611RS-M10, 06RS-M10(B)	
		RBH**16441A**	—	

* Mitsubishi Materials obtained the makers' approval before entering their names in the list.

RECOMMENDED TOOL OVERHANG



(Note) For LU, refer to page G039(CTtype).

RECOMMENDED CUTTING CONDITIONS

Work Material		Cutting Speed (SFM)
P	General Steel	100—260
M	Stainless Steel	100—260
K	Cast Iron	100—260
N	Non Ferrous Materials	165—330

(Note 1) Recommend wet machining.
(Note 2) Please remember when machining small diameters and high speeds there is the possibility that the machine can not keep up with the set feed.

HOLDER CROSS REFERENCE LIST OF METRIC SHANK STANDARD

Holder		MICRO-MINI TWIN	Machine Makers
Type	Order Number	CT	
Round Type Holder ϕ16mm	**RBH1630N**	0305RS-M4, 03RS-M4(B)	MIYANO MACHINERY JAPAN INC. NC lathes
	RBH**1640N**	0407RS-M6, 04RS-M6(B)	
	RBH**1650N**	0511RS-M8, 05RS-M8(B)	
	RBH**1660N**	0611RS-M10, 06RS-M10(B)	
	RBH**1670N**	–	
Round Type Holder ϕ20mm	**RBH2030N**	0305RS-M4, 03RS-M4(B)	Citizen Precision Machinery Co., Ltd. Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	RBH**2040N**	0407RS-M6, 04RS-M6(B)	
	RBH**2050N**	0511RS-M8, 05RS-M8(B)	
	RBH**2060N**	0611RS-M10, 06RS-M10(B)	
	RBH**2070N**	–	
Round Type Holder ϕ22mm	**RBH2230N**	0305RS-M4, 03RS-M4(B)	STAR MICRONICS CO., LTD.
	RBH**2240N**	0407RS-M6, 04RS-M6(B)	
	RBH**2250N**	0511RS-M8, 05RS-M8(B)	
	RBH**2260N**	0611RS-M10, 06RS-M10(B)	
	RBH**2270N**	–	
Round Type Holder ϕ25mm	**RBH2530N**	0305RS-M4, 03RS-M4(B)	Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	RBH**2540N**	0407RS-M6, 04RS-M6(B)	
	RBH**2550N**	0511RS-M8, 05RS-M8(B)	
	RBH**2560N**	0611RS-M10, 06RS-M10(B)	
	RBH**2570N**	–	
Square Type Holder □10mm	**SBH1030R**	0305RS-M4, 03RS-M4(B)	NC lathes
	SBH**1040R**	0407RS-M6, 04RS-M6(B)	
	SBH**1050R**	0511RS-M8, 05RS-M8(B)	
	SBH**1060R**	0611RS-M10, 06RS-M10(B)	
	SBH**1070R**	–	

★ Mitsubishi Materials obtained the makers' approval before entering their names in the list.

HOLDER ➤ E034, E036, E037
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

GUIDE TO HSK-T TOOLS

●Section organization

①Organized by product series.
(Refer to the index on the next page.)

PRODUCT TYPE
indicates the first four letters of the order number, as well as cutting applications.

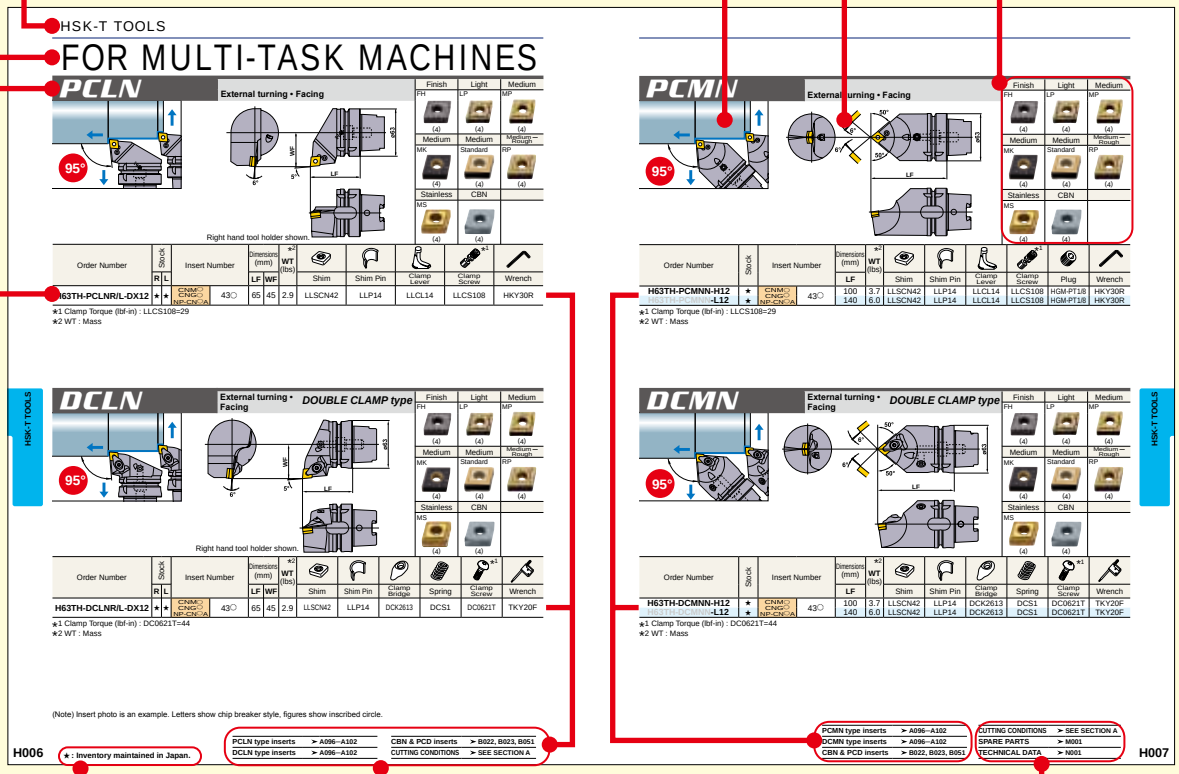
TITLE OF PRODUCT SERIES

PRODUCT SECTION

FIGURE SHOWING THE TOOLING APPLICATION
uses illustrations and arrows to depict available machining applications along with cutting edge lead angles.

GEOMETRY

CHIP BREAKER BY CUTTING APPLICATION



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

REFERENCE PAGE FOR APPLICABLE INSERTS
indicates reference pages for details of inserts that are applicable to the product.

PAGE REFERENCE
· SPARE PARTS
· TECHNICAL DATA
indicates reference pages, including the above, on the right hand page of each double-page spread.

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, and spare parts.

●To Order : Please specify order number and hand of the tool (right/left).

HSK-T TOOLS

OUTLINE OF HSK-T TOOLS H002
CLASSIFICATION OF HSK-T TOOLS H004
STANDARD OF HSK-T TOOLS

EXTERNAL TURNING • FACING

CN○○ INSERTS TOOL HOLDERS H006
DN○○ INSERTS TOOL HOLDERS H011

EXTERNAL TURNING • FACING • BORING

CN○○ INSERTS TOOL HOLDERS H008

EXTERNAL TURNING • COPYING

DN○○ INSERTS TOOL HOLDERS H009

EXTERNAL TURNING • FACING • COPYING

RC○○ INSERTS TOOL HOLDERS H012

FACING • COPYING

VB○○ INSERTS TOOL HOLDERS H013

GROOVING

MG INSERTS TOOL HOLDERS H014

THREADING

MMT INSERTS TOOL HOLDERS H016
MT INSERTS TOOL HOLDERS H017

EXTERNAL TURNING TOOL HOLDERS H019
BORING BAR HOLDERS H021
BORING BAR SLEEVES H022

*Arranged by Alphabetical order

H022 **H100TH-B○○-○○○**
H020 **H100TH-EN3232R/L-130**
H019 **H100TH-EV3232R/L-180**
H008 **H63TH-A○○○DCLNR/L12**
H021 **H63TH-B○○-○○**
H008 **H63TH-DCLNL-L12-3**
H006 **H63TH-DCLNR/L-DX12**
H007 **H63TH-DCMNN-H/L12**
H011 **H63TH-DDJNL-L15-3**
H009 **H63TH-DDJNR/L-DX15**
H010 **H63TH-DDNNN-H/L15**
H020 **H63TH-EN2525R/L-115**
H021 **H63TH-EV2020R/L-105-3**
H019 **H63TH-EV2525R/L-112**
H014 **H63TH-MGHR/L-DX43○○**
H016 **H63TH-MMTENR-H/L16**
H016 **H63TH-MMTER-DX16**
H017 **H63TH-MTHR/L-DX43**
H006 **H63TH-PCLNR/L-DX12**
H007 **H63TH-PCMNN-H/L12**
H009 **H63TH-PDJNR/L-DX15**
H010 **H63TH-PDNNN-H/L15**
H012 **H63TH-PRDCN-H/L12**
H012 **H63TH-PRGCR/L-DX12**
H013 **H63TH-SVPBR/L-DX16**
H013 **H63TH-SVVBN-H/L16**
H022 **SL32○○-90**

Tooling system for turning on multi-task machines

HSK-T TOOLS

HSK-T System (ICTM standard)

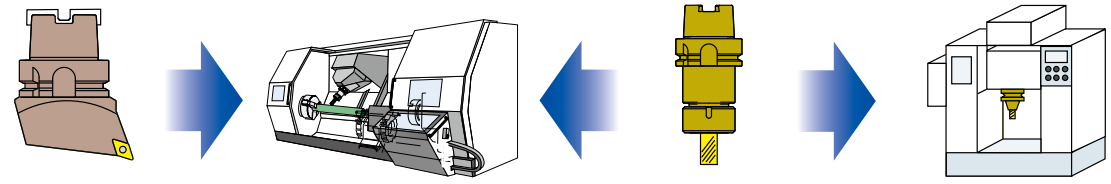
HSK-T is a new HSK system designed for turning on multi-task machines that are compatible with HSK-A type (ISO standard: ISO12164-1:2001).
The HSK system was developed by a consortium of 17 Japanese manufacturers and registered in ISO standard (ISO12164-3:2008) under the name HSK-T type in 2008 and JIS standard (JIS B6064-3) in 2013.



Highly accurate cutting edge positioning

The HSK-T type has a closer tolerance between the spindle key and tool holder keyway than the HSK-A type. This results in higher cutting edge positional accuracies. For milling, the conventional HSK-A type tools can be still used.

Compatible with both multi-task machines and machining centers



HSK-T
Turning tool holder

HSK-T spindle
Multi-task machines

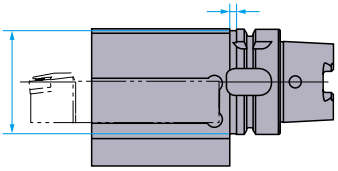
HSK-A63 (ISO standard)
Rotating tool holder

HSK-A spindle
Machining center

∗Note
Short neck length from the flange with thick body of the HSK-T turning tool as shown in the figure at the left.
Because there are machines which cannot be mounted depending on the ATC specifications of the multi-task machine (HSK-A type), please check beforehand.
Also be careful of interference of the magazine with adjacent tools.

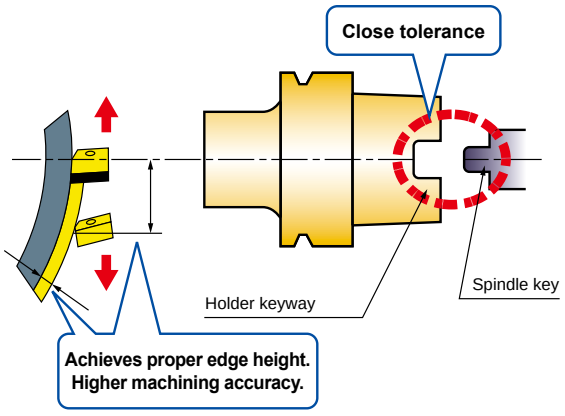
Neck length
HSK-T63 Min.4mm
HSK-T100 Min.5mm

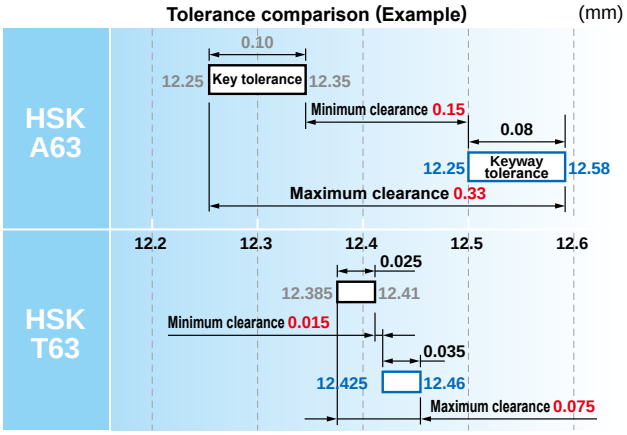
Neck thickness
HSK-T63 Max.62mm
HSK-T100 Max.99mm



HSK-T turning tool standard (Example)

Improved keyway tolerance





From ICTM-HSK to HSK-T

The order numbers of the tool holders will be changed according to the global standardization.

HSK-A○○ equivalent size

ICTM-HSK manual clamping with through coolant holes

Conventional order number	H○○A	–	WH	– XXXX
Revised order number	H○○TH	–		XXXX

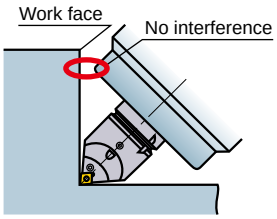
HSK-T○○ size (ICTM-HSK standard)
Manual clamping with through coolant holes

Highly accurate and rigid HSK-T type tooling system for use on multi-task machines.

Straight type tools suitable for use on multi-task machines

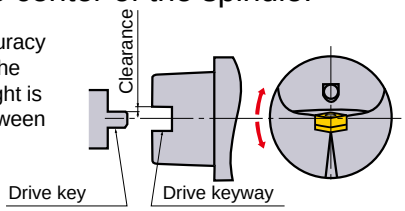
Avoid workpiece interference with improved tool accessibility.

By tilting the machines B spindle (main axis of the tool) at 45 deg. interference between the spindle, holder, workpiece and chuck can be avoided.



Improve centerline height by positioning the cutting edge at the center of the spindle.

Increased stability and accuracy can be achieved because the cutting edge centerline height is not affected by the gap between the spindle and the key.



New single-action double clamp series

The double clamp mechanism offers high rigidity, accuracy, reliability that ensures secure insert clamping. Therefore making it suitable for turning of difficult to machine materials such as stainless and heat resistant alloys.



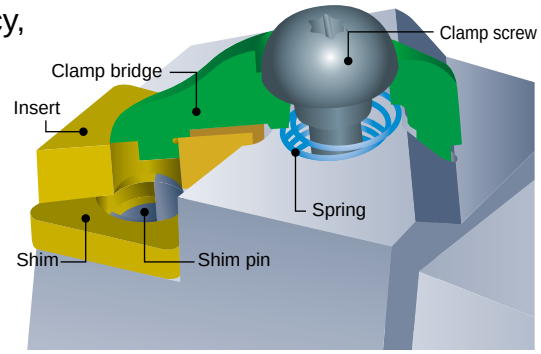
Handed type for turning and facing



Straight type for turning and facing



For turning, facing and boring



3 on 1 tool for process and tool consolidation

3 turning inserts of the same geometry can be installed on a single tool.

The same type of insert can be installed for quick change to back up tools.

Different types of inserts can be installed for different applications (rough and semi finishing and finishing)

Inserts in different grade types can be installed to cover various kinds of workpieces.



New HSK-T100 size for large workpieces

Larger tool holder sizes for high efficiency machining.

Square shank holder type



Boring bar / Drill type



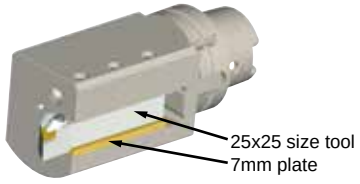
Sleeve



A single tool can be used with different sized tool holders.

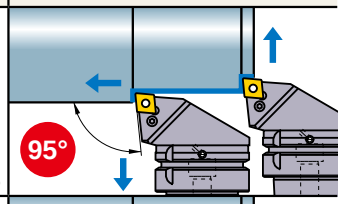
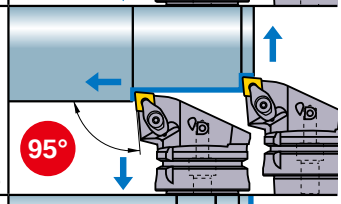
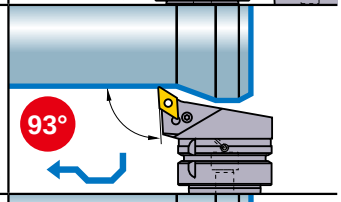
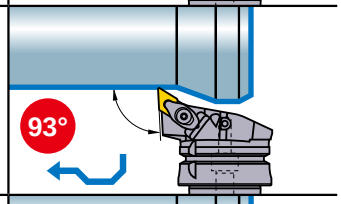
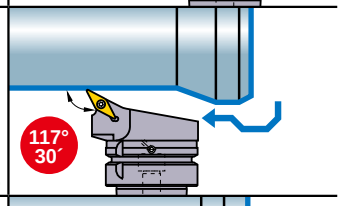
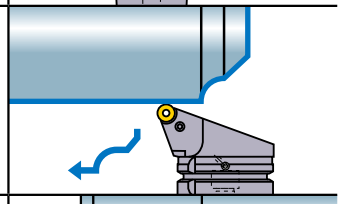
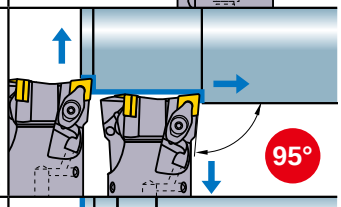
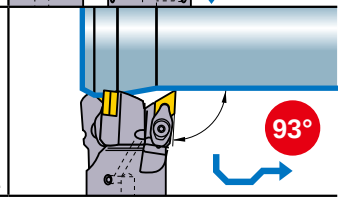
- Available for use with JIS B4126 (ISO 5610) 32x32 and 32x25 tools.
- Possible to fit a 25x25 tool by using a 7mm plate.
  Possible to fit a 1"x1" tool by using a 6.6mm plate.

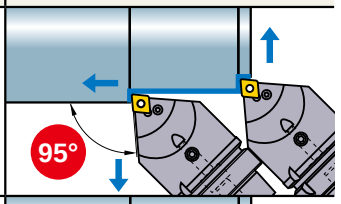
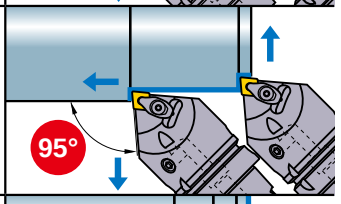
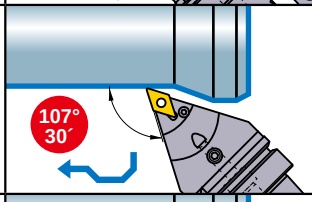
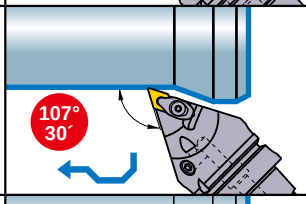
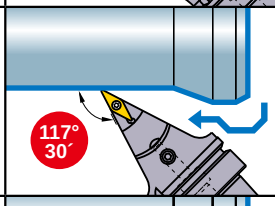
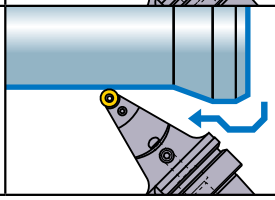
∗Please prepare a plate on your own.



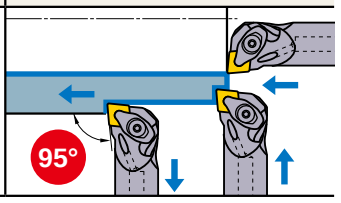
CLASSIFICATION OF HSK-T TOOLS

EXTERNAL TURNING • FACING • COPYING

Order Number	Geometry
H63TH-PCLNR/L-DX12  H006	
H63TH-DCLNR/L-DX12  H006	
H63TH-PDJNR/L-DX15  H009	
H63TH-DDJNR/L-DX15  H009	
H63TH-SVPBR/L-DX16  H013	
H63TH-PRGCR/L-DX12  H012	
H63TH-DCLNL-L12-3  H008	
H63TH-DDJNL-L15-3  H011	

Order Number	Geometry
H63TH-PCMNN-H/L12  H007	
H63TH-DCMNN-H/L12  H007	
H63TH-PDNNN-H/L15  H010	
H63TH-DDNNN-H/L15  H010	
H63TH-SVVBN-H/L16  H013	
H63TH-PRDCN-H/L12  H012	

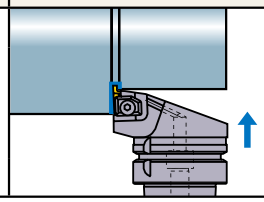
EXTERNAL TURNING • FACING • BORING

Order Number	Geometry
H63TH-A25KDCLNR/L12 **H63TH-A32LDCLNR/L12**  H008	

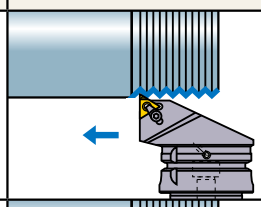
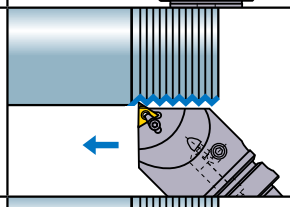
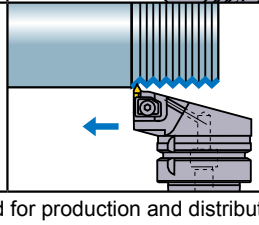
EXTERNAL TURNING TOOL HOLDERS

Order Number	Holder
H63TH-EV2525R/L-112 H019	
H100TH-EV3232R/L-180 H019	
H63TH-EN2525R/L-115 ⋆1 H020	
H100TH-EN3232R/L-130 ⋆1 H020	
H63TH-EV2020R/L-105-3 H021	

GROOVING

Order Number	Geometry
H63TH-MGHR/L-DX43○○  H014	

THREADING

Order Number	Geometry
H63TH-MMTER-DX16  H016	
H63TH-MMTENR-H/L16  H016	
H63TH-MTHR/L-DX43  H017	

BORING BAR HOLDERS

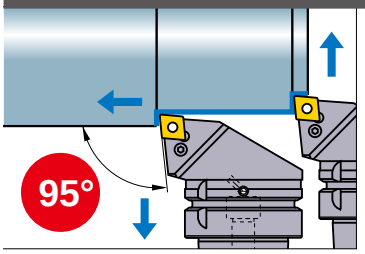
Order Number	Holder
H63TH-B○○-○○ H021	
H100TH-B○○-○○○ H022	
SL32○○-90 (Sleeve) ⋆2 H022	

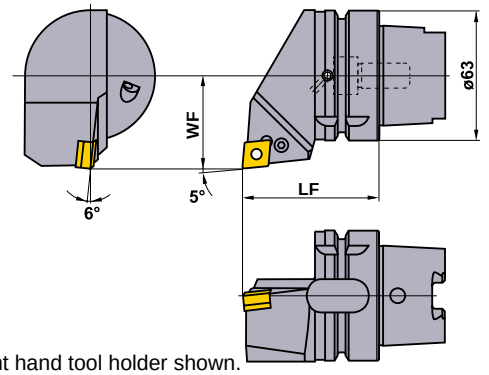
⋆1 Mitsubishi Materials is licensed for production and distribution of these tools from MORI SEIKI Co., LTD. under Japan Patent No.3720202.
⋆2 The SL32○○-90 sleeve is only for use with H100TH-B32-135.

FOR MULTI-TASK MACHINES

PCLN

External turning • Facing





Right hand tool holder shown.

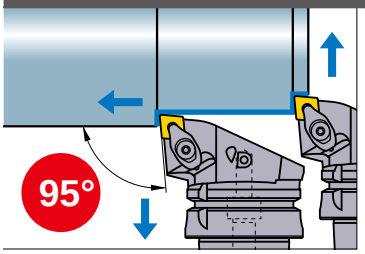
Finish	Light	Medium
FH	LP	MP
 (4)	 (4)	 (4)
Medium	Medium	Medium–Rough
MK	Standard	RP
 (4)	 (4)	 (4)
Stainless	CBN	
MS		
 (4)	 (4)	

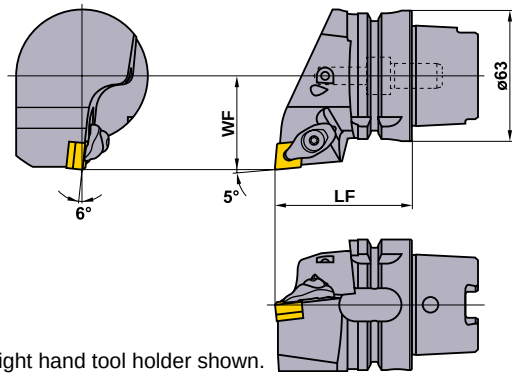
Order Number	Stock R	Stock L	Insert Number	Dimensions (mm) LF	Dimensions (mm) WF	★2 WT (lbs)	Shim	Shim Pin	Clamp Lever	★1 Clamp Screw	Wrench
H63TH-PCLNR/L-DX12	★	★	CNM○ CNG○ NP-CN○A 43○	65	45	2.9	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R

★1 Clamp Torque (lbf-in) : LLCS108=29
★2 WT : Mass

DCLN

External turning • Facing ***DOUBLE CLAMP type***





Right hand tool holder shown.

Finish	Light	Medium
FH	LP	MP
 (4)	 (4)	 (4)
Medium	Medium	Medium–Rough
MK	Standard	RP
 (4)	 (4)	 (4)
Stainless	CBN	
MS		
 (4)	 (4)	

Order Number	Stock R	Stock L	Insert Number	Dimensions (mm) LF	Dimensions (mm) WF	★2 WT (lbs)	Shim	Shim Pin	Clamp Bridge	Spring	★1 Clamp Screw	Wrench
H63TH-DCLNR/L-DX12	★	★	CNM○ CNG○ NP-CN○A 43○	65	45	2.9	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

★1 Clamp Torque (lbf-in) : DC0621T=44
★2 WT : Mass

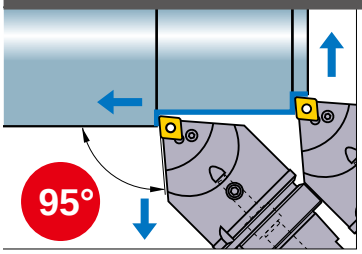
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

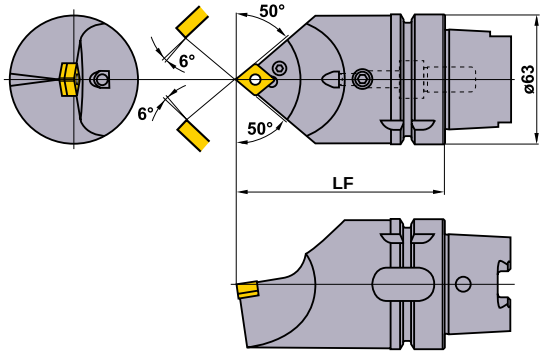
PCLN type inserts	➤ A096–A102	CBN & PCD inserts	➤ B022, B023, B051
DCLN type inserts	➤ A096–A102	CUTTING CONDITIONS	➤ SEE SECTION A

★ : Inventory maintained in Japan.

PCMN

External turning • Facing





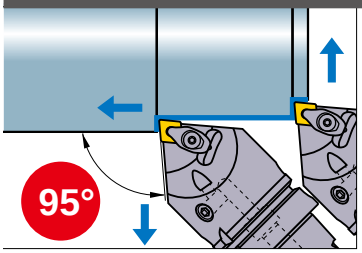
Finish	Light	Medium
FH	LP	MP
 (4)	 (4)	 (4)
Medium	Medium	Medium–Rough
MK	Standard	RP
 (4)	 (4)	 (4)
Stainless	CBN	
MS		
 (4)	 (4)	

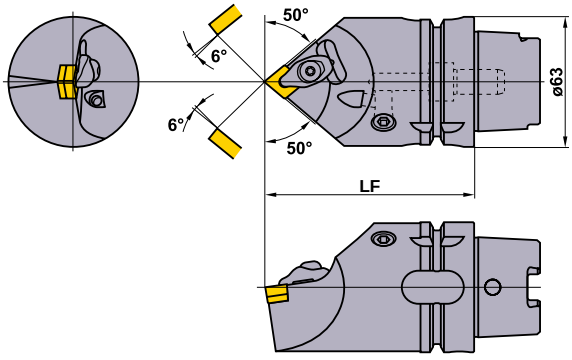
Order Number	Stock	Insert Number		Dimensions (mm) LF	★2 WT (lbs)	Shim	Shim Pin	Clamp Lever	★1 Clamp Screw	Plug	Wrench
H63TH-PCMNN-H12	★	CNM○ CNG○ NP-CN○A	43○	100	3.7	LLSCN42	LLP14	LLCL14	LLCS108	HGM-PT1/8	HKY30R
H63TH-PCMNN-**L12**	★			140	6.0	LLSCN42	LLP14	LLCL14	LLCS108	HGM-PT1/8	HKY30R

★1 Clamp Torque (lbf-in) : LLCS108=29
★2 WT : Mass

DCMN

External turning • Facing ***DOUBLE CLAMP type***





Finish	Light	Medium
FH	LP	MP
 (4)	 (4)	 (4)
Medium	Medium	Medium–Rough
MK	Standard	RP
 (4)	 (4)	 (4)
Stainless	CBN	
MS		
 (4)	 (4)	

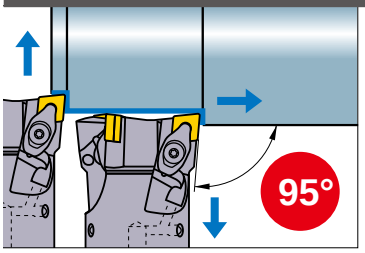
Order Number	Stock	Insert Number		Dimensions (mm) LF	★2 WT (lbs)	Shim	Shim Pin	Clamp Bridge	Spring	★1 Clamp Screw	Wrench
H63TH-DCMNN-H12	★	CNM○ CNG○ NP-CN○A	43○	100	3.7	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
H63TH-DCMNN-**L12**	★			140	6.0	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

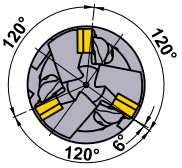
★1 Clamp Torque (lbf-in) : DC0621T=44
★2 WT : Mass

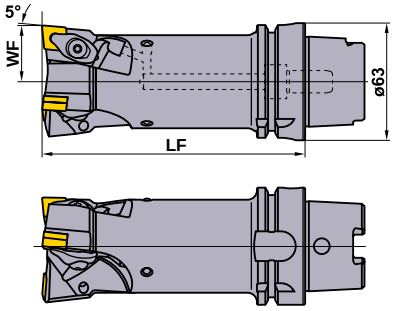
PCMN type inserts	➤ A096–A102	CUTTING CONDITIONS	➤ SEE SECTION A
DCMN type inserts	➤ A096–A102	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B022, B023, B051	TECHNICAL DATA	➤ N001

FOR MULTI-TASK MACHINES

DCLN — External turning • Facing — *DOUBLE CLAMP type*







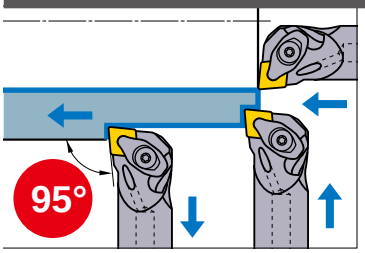
Left hand tool holder only.

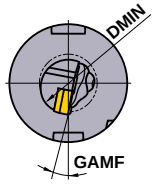
Finish	Light	Medium
FH	LP	MP
 (4)	 (4)	 (4)
Medium	Medium	Medium–Rough
MK	Standard	RP
 (4)	 (4)	 (4)
Stainless	CBN	
MS		
 (4)	 (4)	

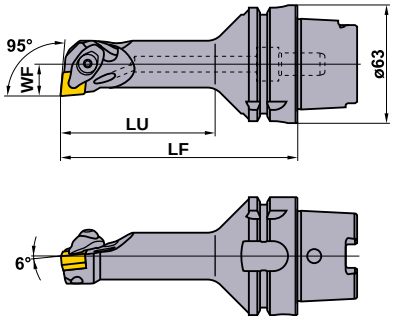
Order Number	Stock	Insert Number		Dimensions (mm)		★2 WT (lbs)	Shim	Shim Pin	Clamp Bridge	Spring	★1 Clamp Screw	Wrench
	L			LF	WF							
H63TH-DCLNL-L12-3	★	CNMO CNGO NP-CNOA	43○	140	30	4.9	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

★1 Clamp Torque (lbf-in) : DC0621T=44
★2 WT : Mass

DCLN — External turning • Facing • Boring — *DOUBLE CLAMP type*







Right hand tool holder shown.

Finish	Light	Medium
FH	LP	MP
 (4)	 (4)	 (4)
Medium	Medium	Medium–Rough
MK	Standard	RP
 (4)	 (4)	 (4)
Stainless	CBN	
MS		
 (4)	 (4)	

Order Number	Stock		Insert Number		Dimensions (mm)				DMIN (mm)	★2 WT (lbs)	Shim	Shim Pin	Clamp Bridge	Spring	★1 Clamp Screw	Wrench
	R	L			LF	LU	WF	GAMF								
H63TH-A25KDCLNR/L12	★	★	CNMO CNGO NP-CNOA	43○	125	82	17	11°	32	2.4	LLSCP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
H63TH-A32LDCLNR/L12	★	★			140	100	22	13°	40	3.9	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

★1 Clamp Torque (lbf-in) : DC0621T=44
★2 WT : Mass

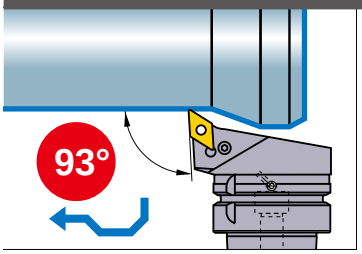
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

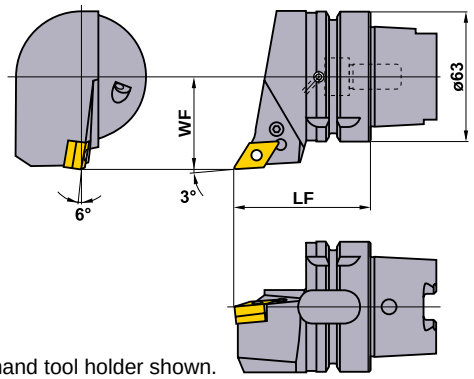
DCLN type inserts	➤ A096–A102
CBN & PCD inserts	➤ B024–B026, B051
CUTTING CONDITIONS	➤ SEE SECTION A

★ : Inventory maintained in Japan.

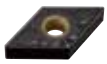
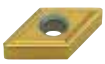
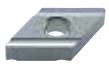
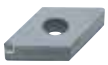
PDJN

External turning • Copying





Right hand tool holder shown.

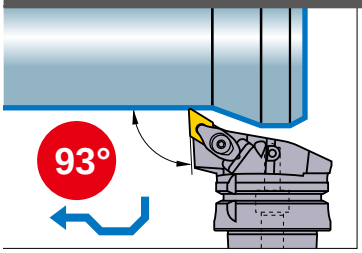
Finish	Light	Medium
FH	LP	MP
		
(4)	(4)	(4)
Medium	**Medium—Rough**	**Stainless**
MK	RP	MS
		
(4)	(4)	(4)
G Class	**CBN**	
R/L		
		
(4)	(4)	

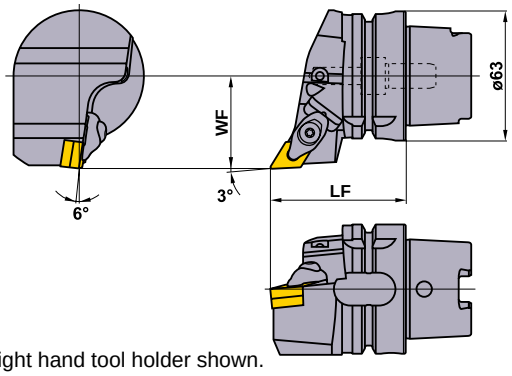
Order Number	Stock		Insert Number	Dimensions (mm)		★3 WT (lbs)	★2			★1	
	R	L		LF	WF		Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench
H63TH-PDJNR/L-DX15	★	★	DNM○ DNG○ NP-DN○A 43○	65	45	2.6	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R

★1 Clamp Torque (lbf-in) : LLCS108=29
★2 Please use shim no. LLSDN42 with .25inch thick inserts. When using .25inch thick inserts, the shim should be ordered separately.
★3 WT : Mass

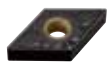
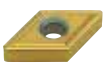
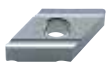
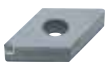
DDJN

External turning • Copying ***DOUBLE CLAMP type***





Right hand tool holder shown.

Finish	Light	Medium
FH	LP	MP
		
(4)	(4)	(4)
Medium	**Medium—Rough**	**Stainless**
MK	RP	MS
		
(4)	(4)	(4)
G Class	**CBN**	
R/L		
		
(4)	(4)	

Order Number	Stock		Insert Number	Dimensions (mm)		★3 WT (lbs)	★2				★1	
	R	L		LF	WF		Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
H63TH-DDJNR/L-DX15	★	★	DNM○ DNG○ NP-DN○A 43○	65	45	2.6	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F

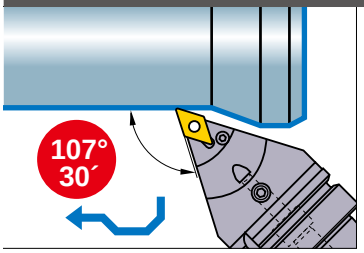
★1 Clamp Torque (lbf-in) : DC0621T=44
★2 Please use shim no. LLSDN42 with .25inch thick inserts. When using .25inch thick inserts, the shim should be ordered separately.
★3 WT : Mass

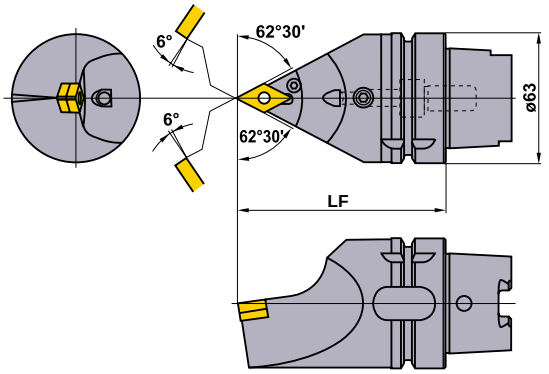
PDJN type inserts	**➤ A103—A109**	**CUTTING CONDITIONS**	**➤ SEE SECTION A**
DDJN type inserts	**➤ A103—A109**	**SPARE PARTS**	**➤ M001**
CBN & PCD inserts	**➤ B024—B026, B051**	**TECHNICAL DATA**	**➤ N001**

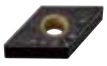
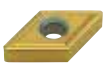
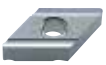
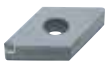
FOR MULTI-TASK MACHINES

PDNN

External turning • Copying





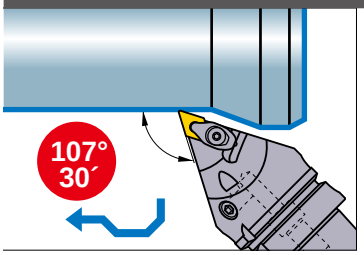
Finish	Light	Medium
FH	LP	MP
		
(4)	(4)	(4)
Medium	**Medium—Rough**	**Stainless**
MK	RP	MS
		
(4)	(4)	(4)
G Class	**CBN**	
R/L		
		
(4)	(4)	

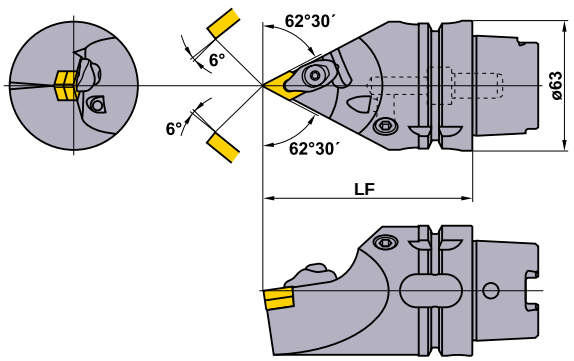
Order Number	Stock	Insert Number		Dimensions (mm) LF	★3 WT (lbs)	★2 Shim	Shim Pin	Clamp Lever	★1 Clamp Screw	Plug	Wrench
H63TH-PDNNN-H15	★	DNM○ DNG○ NP-DN○A	43○	100	3.5	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HGM-PT1/8	HKY30R
H63TH-PDNNN-L15	★			140	5.5	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HGM-PT1/8	HKY30R

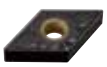
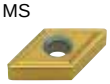
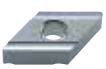
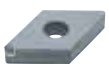
★1 Clamp Torque (lbf-in) : LLCS108=29
★2 Please use shim no. LLSDN42 with .25inch thick inserts. When using .25inch thick inserts, the shim should be ordered separately.
★3 WT : Mass

DDNN

External turning • Copying ***DOUBLE CLAMP type***





Finish	Light	Medium
FH	LP	MP
		
(4)	(4)	(4)
Medium	**Medium—Rough**	**Stainless**
MK	RP	MS
		
(4)	(4)	(4)
G Class	**CBN**	
R/L		
		
(4)	(4)	

Order Number	Stock	Insert Number		Dimensions (mm) LF	★3 WT (lbs)	★2 Shim	Shim Pin	Clamp Bridge	Spring	★1 Clamp Screw	Wrench
H63TH-DDNNN-H15	★	DNM○ DNG○ NP-DN○A	43○	100	3.5	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F
H63TH-DDNNN-L15	★			140	5.5	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F

★1 Clamp Torque (lbf-in) : DC0621T=44
★2 Please use shim no. LLSDN42 with .25inch thick inserts. When using .25inch thick inserts, the shim should be ordered separately.
★3 WT : Mass

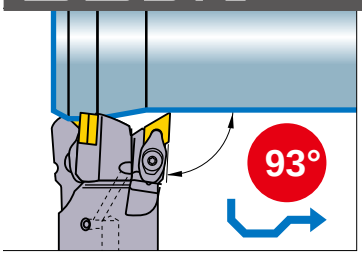
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

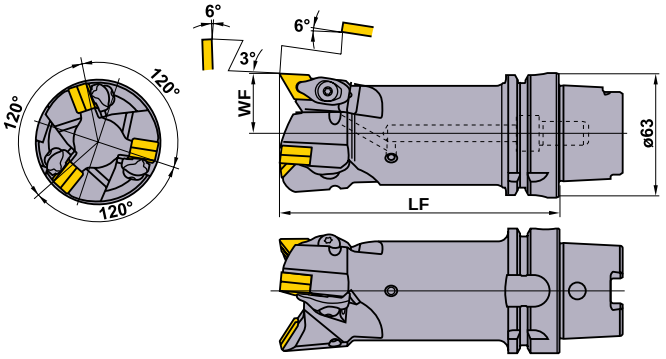
PDNN type inserts	**➤ A103–A109**
DDNN type inserts	**➤ A103–A109**
CBN & PCD inserts	**➤ B024–B026, B051**
CUTTING CONDITIONS	**➤ SEE SECTION A**

★ : Inventory maintained in Japan.

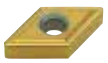
DDJN

External turning • Facing — ***DOUBLE CLAMP type***





Left hand tool holder only.

Finish	Light
FH	LP
	
(4)	(4)
Medium	**Medium**
MP	MK
	
(4)	(4)
Medium—Rough	**Stainless**
RP	MS
	
(4)	(4)

Order Number	Stock	Insert Number		Dimensions (mm)		★3 WT (lbs)	★2				★1	
	L			LF	WF		Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
H63TH-DDJNL-L15-3	★	DNM○ DNG○ NP-DN○A	43○	140	30	4.9	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F

★1 Clamp Torque (lbf-in) : DC0621T=44
★2 Please use shim no. LLSDN42 with .25inch thick inserts. When using .25inch thick inserts, the shim should be ordered separately.
★3 WT : Mass

HSK-T TOOLS

DDJN type inserts	**➤ A103—A109**
CBN & PCD inserts	**➤ B024—B026, B051**
CUTTING CONDITIONS	**➤ SEE SECTION A**
SPARE PARTS	**➤ M001**
TECHNICAL DATA	**➤ N001**

FOR MULTI-TASK MACHINES

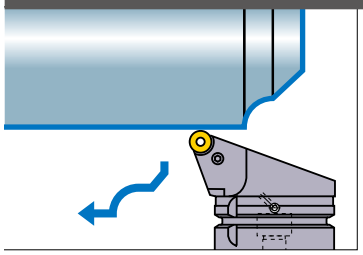
PRGC

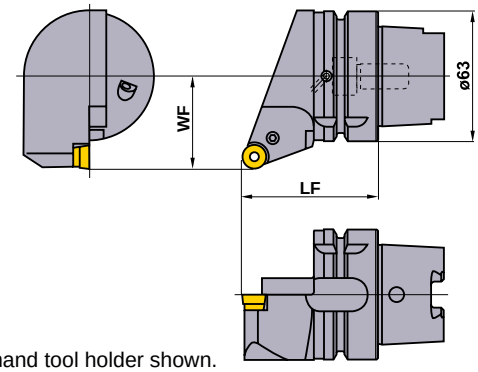
External turning • Facing • Copying

Medium



(12)





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)		★2 WT (lbs)	Shim	Shim Pin	Clamp Lever	★1 Clamp Screw	Wrench
	R	L			LF	WF						
H63TH-PRGCR/L-DX12	★	★	RCMX	1204M0	65	45	2.6	LLSRN123	LLP13	LLCL112	LLCS106	HKY25R

★1 Clamp Torque (lbf-in) : LLCS106=19
★2 WT : Mass

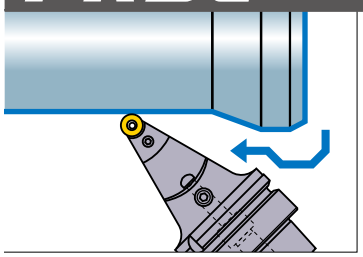
PRDC

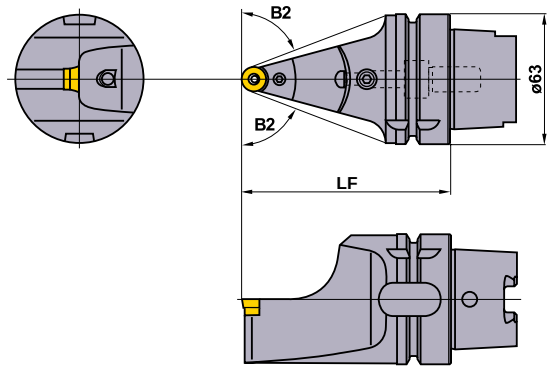
External turning • Facing • Copying

Medium



(12)





Order Number	Stock	Insert Number		Dimensions (mm)		★2 WT (lbs)	Shim	Shim Pin	Clamp Lever	★1 Clamp Screw	Plug	Wrench
				LF	B2							
H63TH-PRDCN-H12	★	RCMX	1204M0	100	69°	3.1	LLSRN123	LLP13	LLCL112	LLCS106	HGM-PT1/8	HKY25R
H63TH-PRDCN-L12	★			140	75°	5.1	LLSRN123	LLP13	LLCL112	LLCS106	HGM-PT1/8	HKY25R

★1 Clamp Torque (lbf-in) : LLCS106=19
★2 WT : Mass

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Cutting Mode	Breaker	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	Medium Cutting	**Standard**	**UE6110**	670—1150
P	Carbon Steel • Alloy Steel	180HB—350HB	Medium Cutting	**Standard**	**UE6110**	490—850
M	Stainless Steel	≤200HB	Medium Cutting	**Standard**	**US735**	230—425

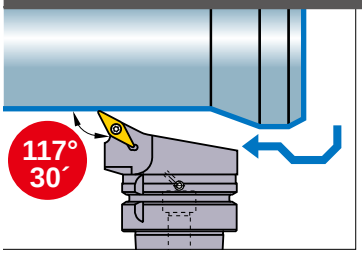
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

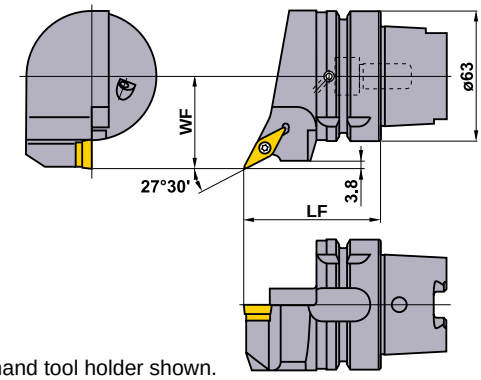
PRGC type inserts ➤ A151
PRDC type inserts ➤ A151
SPARE PARTS ➤ M001

★ : Inventory maintained in Japan.

SVPB

Facing • Copying





Right hand tool holder shown.

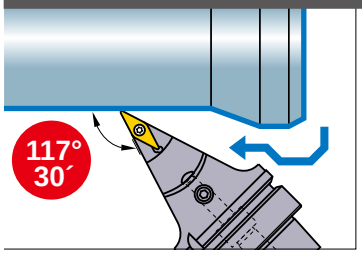
Finish	Light
R/L-F	SV
(3)	(3)
Medium	**Medium**
MV	MP
(3)	(3)
Stainless	**CBN**
MM	
(3)	(3)

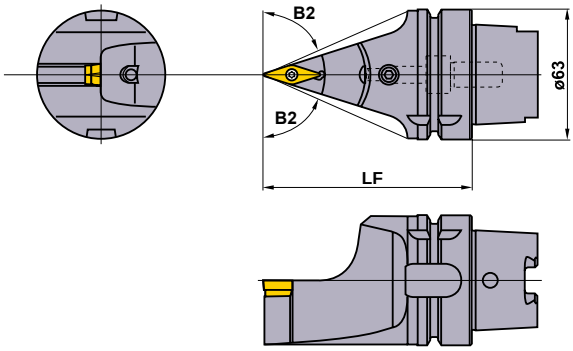
Order Number	Stock		Insert Number		Dimensions (mm)		⋆2 WT (lbs)	Shim	Shim Pin	⋆1 Clamp Screw	Wrench
	R	L			LF	WF					
H63TH-SVPBR/L-DX16	★	★	VBMT VBGT	33○	65	45	2.4	SPSVN32	BCP141	TS35D	TKY15F

⋆1 Clamp Torque (lbf-in) : TS35D=31
⋆2 WT : Mass

SVVB

Facing • Copying





Finish	Light
R/L-F	SV
(3)	(3)
Medium	**Medium**
MV	MP
(3)	(3)
Stainless	**CBN**
MM	
(3)	(3)

Order Number	Stock	Insert Number		Dimensions (mm)		⋆2 WT (lbs)	Shim	Shim Pin	⋆1 Clamp Screw	Plug	Wrench
				LF	B2						
H63TH-SVVBN-H16	★	VBMT VBGT	33○	100	66°30'	2.9	SPSVN32	BCP141	TS35D	HGM-PT1/8	TKY15F
H63TH-SVVBN-L16	★			140	72°30'	4.9	SPSVN32	BCP141	TS35D	HGM-PT1/8	TKY15F

⋆1 Clamp Torque (lbf-in) : TS35D=31
⋆2 WT : Mass

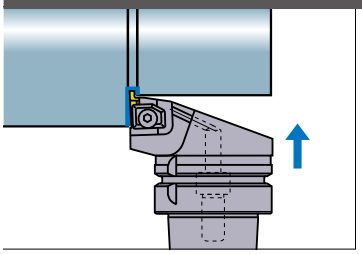
RECOMMENDED CUTTING CONDITIONS

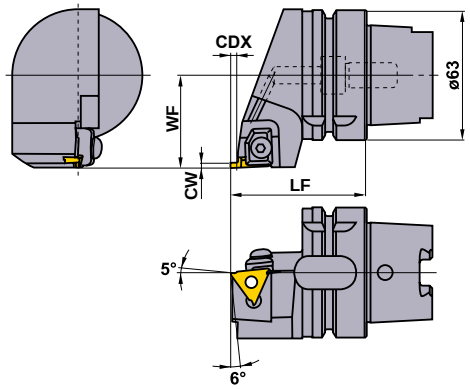
	Work Material	Hardness	Cutting Mode	Breaker	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	Finish Cutting	**F**	**AP25N**	820 (490—985)
			Medium Cutting	**MV**	**UE6020**	655 (490—820)
	Carbon Steel Alloy Steel	180HB—350HB	Finish Cutting	**F**	**AP25N**	690 (490—850)
			Medium Cutting	**MV**	**UE6020**	555 (390—690)
M	Stainless Steel	≤200HB	Medium Cutting	**MM**	**MC7025**	500 (280—705)
K	Gray Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	**MV**	**UE6020**	555 (460—655)

SVPB type inserts ➤ A162—A164
SVVB type inserts ➤ A162—A164
CBN inserts ➤ B044
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

FOR MULTI-TASK MACHINES

MG — Grooving





Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) CW	CDX	LF	WF	★2 WT (lbs)	Clamp Bridge	★1 Clamp Screw	Spring	Wrench
H63TH-MGHR/L-DX4315	★	★	MGTR/L	43125 I 43470	1.25	1.2	65	45	2.6	MTK1R/L	HBH06020	MES3	HKY40R
					1.45	1.5							
					1.5≦CW≦2.3	3							
H63TH-MGHR/L-DX4323	★	★			2.3<CW≦3.3	4.5							
H63TH-MGHR/L-DX4333	★	★			3.3<CW≦4.7	4.5							

★1 Clamp Torque (lbf-in) : HBH06020=62
★2 WT : Mass

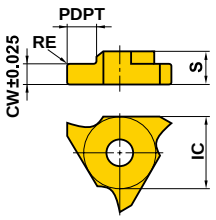
RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel Alloy Steel	180—350HB	**VP20MF**	390 (330—460)	.0039 (.0012—.0071)
			NX2525	425 (330—525)	.0047 (.0012—.0079)
M	Stainless Steel	≦200HB	**VP20MF**	390 (330—460)	.0039 (.0012—.0071)
K	Gray Cast Iron	Tensile Strength≦350MPa	**VP20MF**	390 (330—460)	.0039 (.0012—.0071)

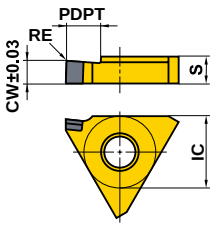
★ : Inventory maintained in Japan. (10 inserts in one case) (1 insert in one case for CBN)

INSERTS FOR MG TYPE

Order Number	Stock							Dimensions (mm)					Geometry (mm)
	Coated		Cermet		Carbide		CBN						
	VP20MF		NX2525		UTi20T		MB8025	CW	PDPT	IC	S	RE	
	R	L	R	L	R	L	R						
MGTR/L43125	★	★	★	★	★	★	★	1.25	1.2	12.7	4.76	0.2	**MGTR/L...**
MGTR/L**43145**	★	★		★	★	★		1.45	1.5	12.7	4.76	0.2	
MGTR/L**43150**	★	★	★	★	★	★	★	1.5	3	12.7	4.76	0.2	
MGTR/L**43175**	★	★	★	★	★	★		1.75	3	12.7	4.76	0.2	
MGTR/L**43200**	★	★	★	★	★	★	★	2	3	12.7	4.76	0.2	
MGTR/L**43230**	★	★	★	★	★	★		2.3	3	12.7	4.76	0.2	
MGTR/L**43250**	★	★	★	★	★	★	★	2.5	4.5	12.7	4.76	0.3	
MGTR/L**43260**	★	★	★		★	★		2.6	4.5	12.7	4.76	0.3	
MGTR/L**43270**	★	★			★	★		2.7	4.5	12.7	4.76	0.3	
MGTR/L**43280**		★		★	★	★		2.8	4.5	12.7	4.76	0.3	
MGTR/L**43300**	★	★	★	★	★	★	★	3	4.5	12.7	4.76	0.3	
MGTR/L**43320**	★				★	★		3.2	4.5	12.7	4.76	0.3	
MGTR/L**43330**		★		★	★	★		3.3	4.5	12.7	4.76	0.3	
MGTR/L**43350**	★	★	★	★	★	★	★	3.5	4.5	12.7	4.76	0.3	
MGTR/L**43400**	★	★	★		★	★	★	4	4.5	12.7	4.76	0.3	
MGTR/L**43420**	★	★	★		★	★		4.2	4.5	12.7	4.76	0.4	
MGTR/L**43430**	★	★	★		★	★		4.3	4.5	12.7	4.76	0.4	
MGTR/L**43450**	★	★	★	★	★	★		4.5	4.5	12.7	4.76	0.4	
MGTR/L**43470**	★	★	★	★	★	★		4.7	4.5	12.7	4.76	0.4	



CBN Insert



Right hand insert shown.

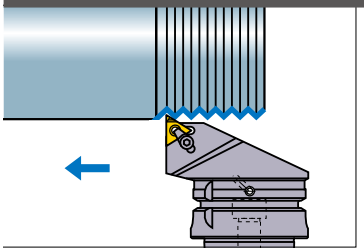
HSK-T TOOLS

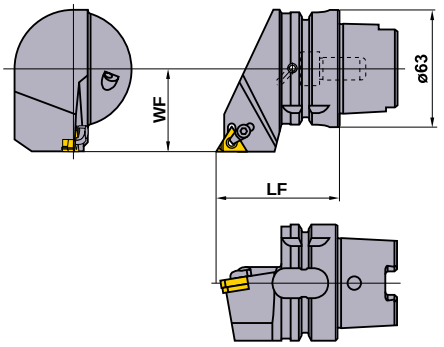
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

FOR MULTI-TASK MACHINES

MMTE

Threading





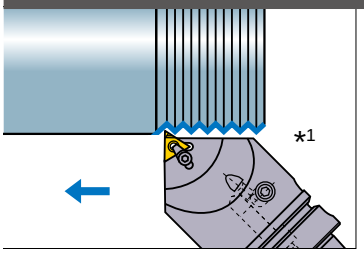
Right hand tool holder only.

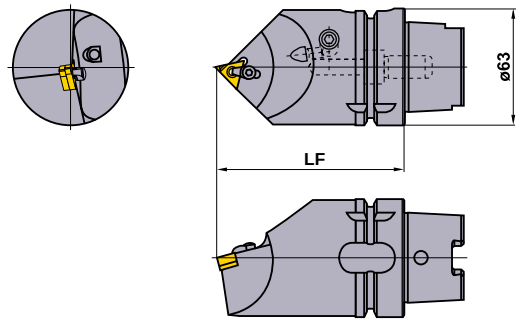
Order Number	Stock	Insert Number		Dimensions (mm)		★2 WT (lbs)	Clamp Bridge	Clamp Screw ★1	Stop Ring	Shim	Shim Screw ★1	Wrench
	R			LF	WF							
H63TH-MMTER-DX16	★	MMT16ER	○○○○○	65	45	2.6	SETK51	SETS51	CR4	CTE32TP15	HFC03008	①TKY15F ②HKY20R

★1 Clamp Torque (lbf-in) : SETS51=31, HFC03008=13
★2 WT : Mass

MMTEN

Threading





Tool holder for right hand insert only.

Order Number	Stock	Insert Number		Dimensions (mm)	★3 WT (lbs)	Clamp Bridge	Clamp Screw ★2	Stop Ring	Shim	Shim Screw ★2	Plug	Wrench
				LF								
H63TH-MMTENR-H16	★	MMT16ER	○○○○○	100	3.7	SETK51	SETS51	CR4	CTE32TP15	HFC03008	HGM-PT1/8	①TKY15F ②HKY20R
H63TH-MMTENR-**L16**	★			140	6.0	SETK51	SETS51	CR4	CTE32TP15	HFC03008	HGM-PT1/8	①TKY15F ②HKY20R

★1 For use with B axis tilted at 45 degrees.
★2 Clamp Torque (lbf-in) : SETS51=31, HFC03008=13
★3 WT : Mass

RECOMMENDED CUTTING CONDITIONS

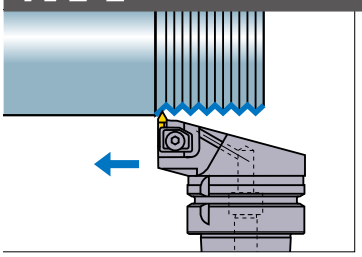
	Work Material	Hardness	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	**VP10MF**	490 (230—755)
			VP15TF	330 (195—460)
	Carbon Steel Alloy Steel	180—350HB	**VP10MF**	460 (260—655)
			VP15TF	330 (195—460)
M	Stainless Steel	≤200HB	**VP10MF**	425 (260—590)
			VP15TF	260 (130—390)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP10MF**	460 (260—655)
			VP15TF	295 (195—390)

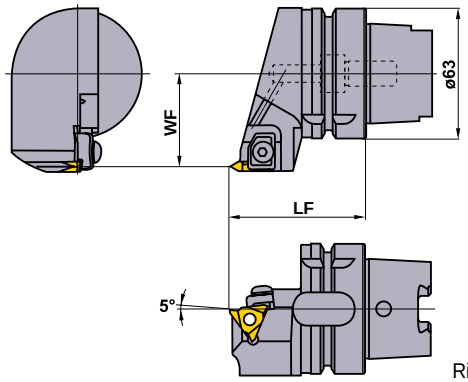
★: Inventory maintained in Japan.
(5 inserts in one case)

MMT type inserts ➤ G014, G016, G018, G020

MT

Threading





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)		★2 WT (lbs)		★1 		
	R	L			LF	WF		Clamp Bridge	Clamp Screw	Spring	Wrench
H63TH-MTHR/L-DX43	★	★	MTTR/L	43○○○○	65	45	2.6	MTK1R/L	HBH06020	MES3	HKY40R

★1 Clamp Torque (lbf-in) : HBH06020=62
★2 WT : Mass

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	**UP20M**	460 (330−590)
			NX2525	655 (490−820)
			UTi20T	390 (330−490)
	Carbon Steel Alloy Steel	180HB−350HB	**UP20M**	390 (330−490)
			NX2525	555 (490−655)
			UTi20T	330 (230−390)
M	Stainless Steel	≤200HB	**UP20M**	390 (260−490)
			UTi20T	330 (230−425)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**UP20M**	260 (195−330)
			UTi20T	260 (195−330)
			HTi10	330 (230−425)

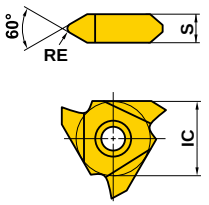
★ : Inventory maintained in Japan.
(10 inserts in one case)

MT type inserts	**➤ H018**
SPARE PARTS	**➤ M001**
TECHNICAL DATA	**➤ N001**

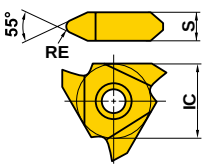
FOR MULTI-TASK MACHINES

INSERTS FOR MT TYPE

Type	Order Number	Class	Coated	Cermet		Carbide		Pitch		Dimensions (mm)			Geometry
			UP20M	NX2525		UTi20T	HTi10	mm	thread/inch	IC	S	RE	
Partial Profile 60°	MTTR436000	G		★		★		−0.8		12.7	4.76	0	MTTR/L(60°) Partial profile
	MTTR436001	G	★	★		★	★	1.0−1.75		12.7	4.76	0.1	
	MTTL436001	G	★			★	★	1.0−1.75		12.7	4.76	0.1	
	MTTR436002	G	★	★		★	★	2.0−2.5		12.7	4.76	0.2	
	MTTL436002	G		★		★		2.0−2.5		12.7	4.76	0.2	
	MTTR436003	G	★	★		★	★	3.0−3.5		12.7	4.76	0.3	
	MTTL436003	G		★		★		3.0−3.5		12.7	4.76	0.3	
	MTTR436004	G		★		★		4.0−4.5		12.7	4.76	0.4	
Partial Profile 55°	MTTR435501	G		★		★			28−10	12.7	4.76	0.1	MTTR(55°) Partial profile
	MTTR435502	G		★		★			16−8	12.7	4.76	0.2	
	MTTR435503	G		★		★			11−8	12.7	4.76	0.3	



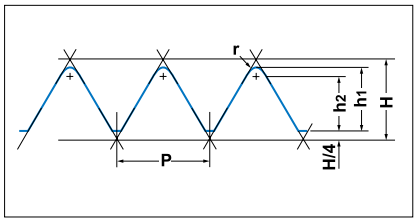
Right hand insert shown.



Right hand insert shown.

STANDARD OF DEPTH OF CUT

- The chart on the right shows the cutting depths when machining external ISO metric screw threads.
- When using cermet grades or cutting stainless steel, please increase the number of passes by 2 or 3 extra passes.



Metric Screw Thread

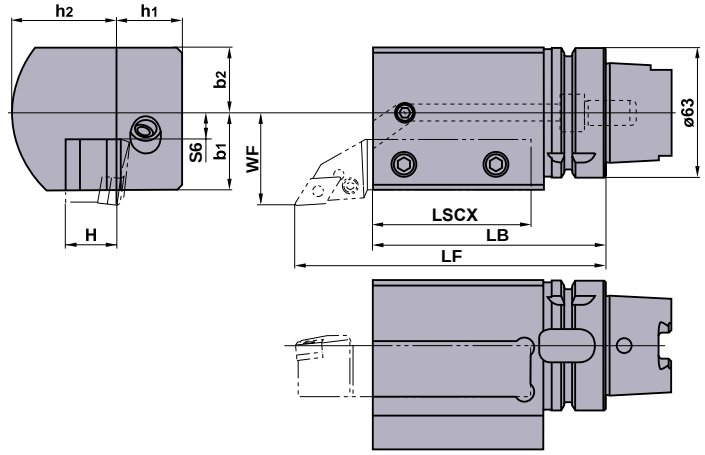
Unit : mm

P (Pitch)		0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50
h_1		0.46	0.61	0.77	0.92	1.07	1.23	1.53	1.84	2.15	2.45	2.76
h_2		0.35	0.47	0.59	0.70	0.82	0.94	1.17	1.41	1.65	1.87	2.11
r (Corner Radius)		0.11	0.14	0.18	0.22	0.25	0.29	0.36	0.43	0.50	0.58	0.65
Number of Passes	1	0.18	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35	0.35	0.40
	2	0.13	0.15	0.18	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35
	3	0.10	0.10	0.12	0.15	0.20	0.20	0.20	0.25	0.25	0.25	0.30
	4	0.05	0.10	0.12	0.15	0.15	0.15	0.20	0.20	0.20	0.25	0.25
	5		0.06	0.10	0.10	0.12	0.15	0.15	0.20	0.20	0.25	0.25
	6			0.05	0.07	0.10	0.10	0.10	0.15	0.20	0.20	0.20
	7					0.05	0.08	0.10	0.15	0.15	0.20	0.20
	8						0.05	0.10	0.10	0.15	0.15	0.15
	9							0.08	0.10	0.10	0.15	0.15
	10							0.05	0.09	0.10	0.10	0.15
	11								0.05	0.10	0.10	0.10
	12									0.05	0.10	0.10
	13										0.05	0.10
	14											0.06

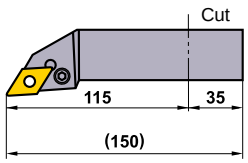
(Note) The first pass causes a high load on the cutting edge.
In order to avoid damage, keep the depth of cut to 0.4−0.5mm maximum.

★ : Inventory maintained in Japan.
(10 inserts in one case)

EXTERNAL TURNING TOOL HOLDERS External turning • Facing



■This holder is for 25×25 size tools.
Please shorten the tool as shown below before use.

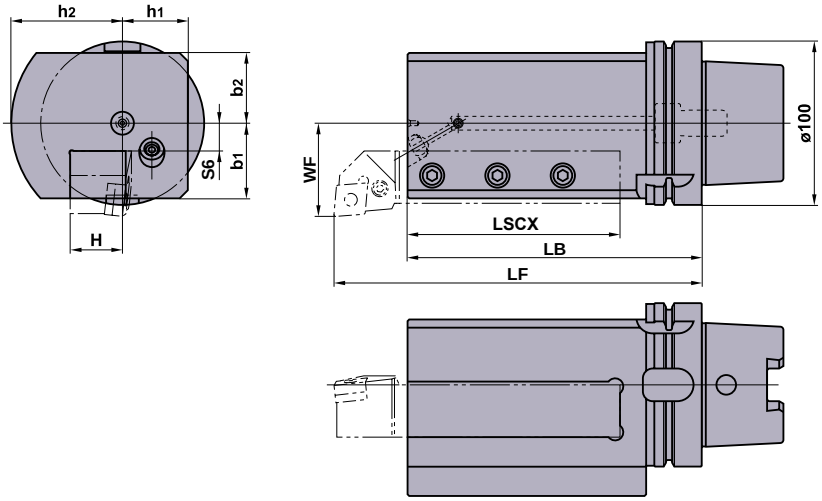


Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)										* WT (lbs)		
	R	L	LF	LB	LSCX	H	h1	h2	WF	S6	b1	b2		Clamp Screw	Plug
H63TH-EV2525R/L-112	★	★	150	112	77	25	32	53	45	13	38	32	8.6	HSS12025	HGM-PT1/8

★ WT : Mass

EXTERNAL TURNING TOOL HOLDERS External turning • Facing



■This holder is for 32×32 and 32 x 25 size tools.

Right hand tool holder shown.

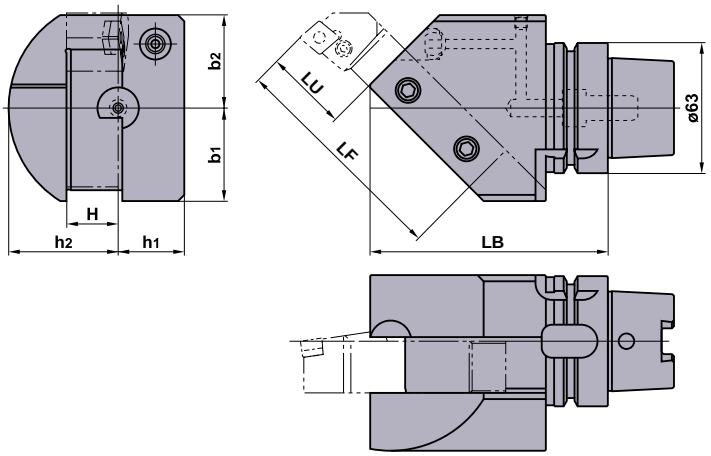
Order Number	Stock		Dimensions (mm)										* WT (lbs)		
	R	L	LF	LB	LSCX	H	h1	h2	WF	S6	b1	b2		Clamp Screw	Plug
H100TH-EV3232R/L-180	★	★	220	180	130	32	40	68	57	17	46	43	25.8	HSS14035	HSS06006

★ WT : Mass
(Note) Possible to fit a 25 x 25 tool by using a 7mm plate.
Possible to fit a 1" x 1" tool by using a 6.6mm plate.

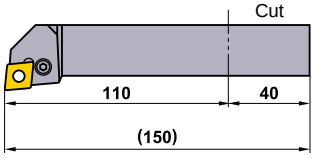
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

FOR MULTI-TASK MACHINES

EXTERNAL TURNING TOOL HOLDERS External turning • Facing



■This holder is for 25×25 size tools.
Please shorten the tool as shown below before use.



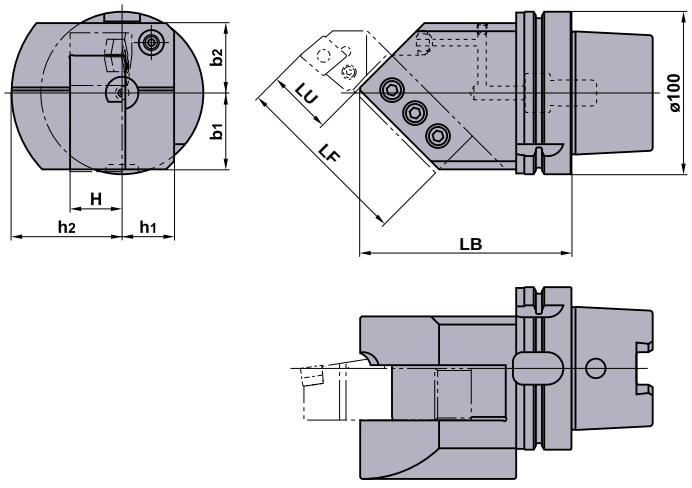
Mitsubishi Materials is licensed for production and distribution of these tools from MORI SEIKI Co., LTD. under Japan Patent No.3720202.

Right hand tool holder shown.

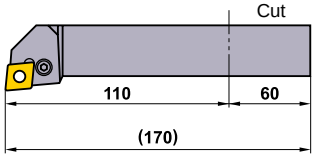
Order Number	Stock		Dimensions (mm)								* WT (lbs)		
	R	L	LB	LU	LF	H	h_1	h_2	b_1	b_2		Clamp Screw	Plug
H63TH-EN2525R/L-115	★	★	115	40	110	25	32	53	45	45	8.2	HSS12030	HSS06006

★ WT : Mass

EXTERNAL TURNING TOOL HOLDERS External turning • Facing



■This holder is for 32×32 and 32 x 25 size tools.
Please shorten the tool as shown below before use.



Mitsubishi Materials is licensed for production and distribution of these tools from MORI SEIKI Co., LTD. under Japan Patent No.3720202.

Right hand tool holder shown.

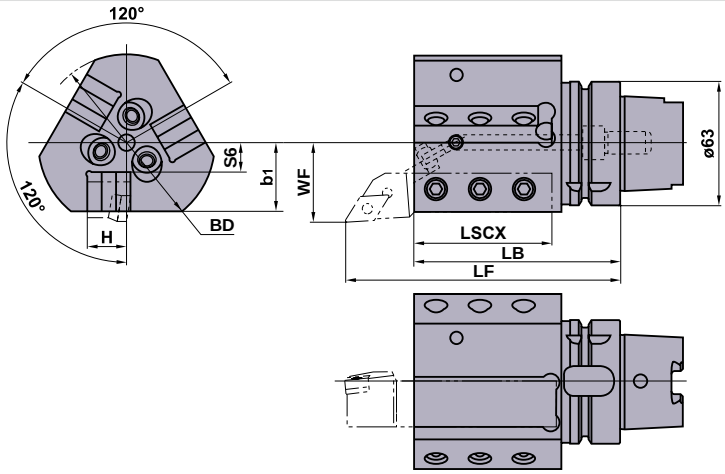
Order Number	Stock		Dimensions (mm)								* WT (lbs)		
	R	L	LB	LU	LF	H	h_1	h_2	b_1	b_2		Clamp Screw	Plug
H100TH-EN3232R/L-130	★	★	130	40	110	32	32	68	47	43	14.6	HSS14030	HSS06006

★ WT : Mass
(Note) Possible to fit a 25 x 25 tool by using a 7mm plate.
Possible to fit a 1" x 1" tool by using a 6.6mm plate.

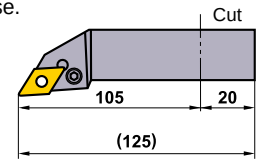
★ : Inventory maintained in Japan.

EXTERNAL TURNING TOOL HOLDERS

External turning • Facing



■This holder is for 20×20 size tools.
Please shorten the tool as shown below before use.



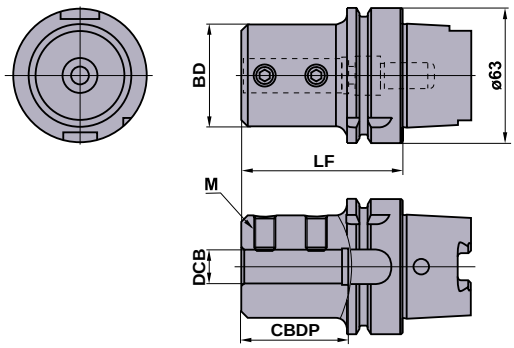
Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)								* WT (lbs)	Clamp Screw	Nozzle Plug	Plug
	R	L	LF	LB	LSCX	H	BD	WF	S6	b1				
H63TH-EV2020R/L-105-3	★	★	140	105	70	20	90	40	15	35	6.4	HSS12030	HSS05012	HSS06006

* WT : Mass

BORING BAR HOLDERS

Internal turning



Order Number	Stock	Dimensions (mm)					* WT (lbs)	Clamp Screw
		BD	DCB	LF	CBDP	M		
H63TH-B08-65	★	28	8	65	40	M8	2.0	HSS08010
H63TH-**B10-70**	★	35	10	70	45	M8	2.2	HSS08012
H63TH-**B12-70**	★	42	12	70	45	M8	2.4	HSS08012
H63TH-**B16-75**	★	48	16	75	50	M10	2.9	HSS10016
H63TH-**B20-75**	★	52	20	75	50	M10	3.1	HSS10016
H63TH-**B25-83**	★	62	25	83	58	M12	3.7	HSS12016
H63TH-**B32-87**	★	62	32	87	62	M12	3.7	HSS12016
H63TH-**B40-97**	★	65	40	97	72	M16	4.0	HSS16012

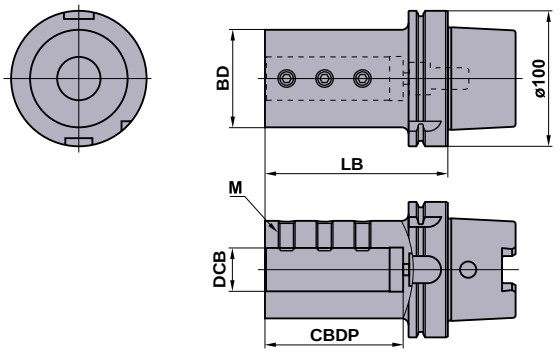
* WT : Mass

(Note) Please cut the boring bar to adjust the shank length, this also applies to indexable type drills.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

FOR MULTI-TASK MACHINES

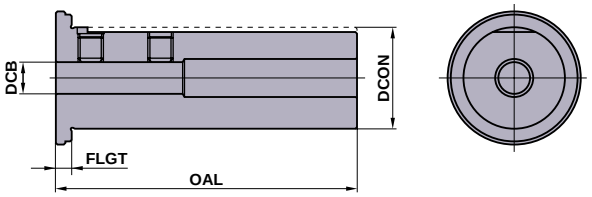
BORING BAR HOLDERS Internal turning



Order Number	Stock	Dimensions (mm)					* WT (lbs)	Clamp Screw
		BD	DCB	LB	CBDP	M		
H100TH-B25-120	★	62	25	120	88	12	8.6	HSS12016
H100TH-B32-135	★	72	32	135	102	12	10.6	HSS12018
H100TH-B40-150	★	82	40	150	117	16	13.0	HSS16020
H100TH-B50-180	★	92	50	180	147	16	17.0	HSS16020

★ WT : Mass
(Note) Please cut the boring bar to adjust the shank length, this also applies to indexable type drills.

BORING BAR SLEEVES FOR H100TH-B32-135



Order Number	Stock	Dimensions (mm)				* WT (lbs)	Clamp Screw
		DCB	DCON	OAL	FLGT		
SL3208-90	★	8	32	95	5	1.3	HSS06008
SL3210-90	★	10	32	95	5	1.1	HSS08008
SL3212-90	★	12	32	95	5	1.1	HSS08008
SL3216-90	★	16	32	95	5	1.1	HSS08006
SL3220-90	★	20	32	95	5	0.9	HSS08005

★ WT : Mass
(Note) These sleeves are only compatible with H100TH-B32-135 holder.

★ : Inventory maintained in Japan.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Memo

GUIDE TO SOLID CARBIDE END MILLS

●Section organization

①Organized according to cutting mode for milling. (Refer to END MILL LIST.)

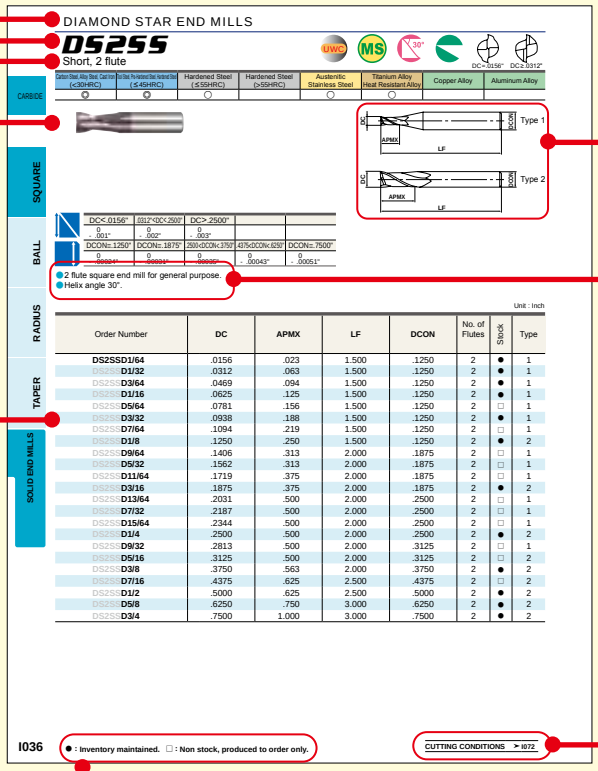


PHOTO OF PRODUCT

PRODUCT TITLE

ITEM NUMBER

PRODUCT BLOCK

GEOMETRY

PRODUCT FEATURES

PAGE REFERENCE
·CUTTING CONDITIONS

LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

PRODUCT STANDARDS
indicates diameters, order numbers, stock status, dimensions, and for the title product.

●To Order: **Please specify product title and order number.**

MILLING

SOLID CARBIDE END MILLS

PRODUCT CODE CORRESPONDENCES ····· I002
SYMBOL DESCRIPTIONS ····· I003
TOOL NAVI ····· I006
END MILLS SELECTION CHART ····· I026

SOLID ENDMILL STANDARD
DIAMOND STAR END MILLS (DS Type) ····· I036
MSTAR END MILLS (MS Type) ····· I074
MIRACLE END MILLS (VC Type) ····· I161
SMART MIRACLE END MILLS (VQ Type) ····· I202
IMPACT MIRACLE END MILLS (VF Type) ····· I252
DIAMOND COATED END MILLS (DFC Type) ····· I330
DIAMOND COATED END MILLS (DF Type) ····· I332
CBN END MILLS ····· I347
UNCOATED CARBIDE END MILLS ····· I351
ALIMASTER END MILLS ····· I359
EXCHANGEABLE HEAD END MILLS (iMX Type) ····· I364

∗Arranged by Alphabetical order

I355 **C2MHA**
I351 **C2SA**
I353 **C3SA**
I357 **C3SARB**
I347 **CBN2XLB**
I349 **CBN2XLRB**
I359 **CSRA**
I361 **CSRARB**
I336 **DF2MB**
I338 **DF2XLB**
I342 **DF3XB**
I332 **DF4JC**
I333 **DF4XL**
I330 **DFC4JC**
I331 **DFCJRT**
I344 **DFPSRB**
I045 **DS2LB** (INCH)
I038 **DS2LS** (INCH)
I054 **DS2MRB** (INCH)
I037 **DS2MS** (INCH)
I044 **DS2SB** (INCH)
I053 **DS2SRB** (INCH)
I057 **DS2SRB_A** (INCH)
I058 **DS2SRB_NA** (INCH)
I036 **DS2SS** (INCH)
I040 **DS3MC** (INCH)
I061 **DS3MH_SS** (INCH)
I065 **DS3MHB_SS** (INCH)
I049 **DS3MHH60** (INCH)
I070 **DS3MHHRB** (INCH)
I059 **DS3MHR_A** (INCH)
I067 **DS3MHRB_SS** (INCH)
I046 **DS3SB** (INCH)
I039 **DS3SC** (INCH)
I060 **DS3SH_SS** (INCH)
I064 **DS3SHB_SS** (INCH)
I066 **DS3SHRB_SS** (INCH)
I048 **DS4LB** (INCH)
I043 **DS4LC** (INCH)
I052 **DS4LC_CB** (INCH)
I042 **DS4MC** (INCH)
I051 **DS4MC_CB** (INCH)
I056 **DS4MRB** (INCH)
I047 **DS4SB** (INCH)
I041 **DS4SC** (INCH)
I055 **DS4SRB** (INCH)
I063 **DS5LH_SS** (INCH)
I062 **DS5MH_SS** (INCH)
I069 **DS5MHRB_SS** (INCH)
I068 **DS5SHRB_SS** (INCH)
I050 **DS6MHH60** (INCH)
I071 **DS6MHHRB** (INCH)
I364 **IMX**
I114 **MS2ES**
I080 **MS2JS**
I082 **MS2LS**
I121 **MS2MB**
I078 **MS2MD**
I132 **MS2MRB**
I075 **MS2MS**
I143 **MS2MT**
I155 **MS2MTB**
I119 **MS2SB**
I074 **MS2SS**
I091 **MS2XL** (INCH)
I084 **MS2XL**
I088 **MS2XL6**
I129 **MS2XLB** (INCH)
I123 **MS2XLB**
I135 **MS2XLRB**
I115 **MS3ES**
I117 **MS4EC**
I106 **MS4JC**
I148 **MS4LT**
I157 **MS4LTB**
I104 **MS4MC**
I137 **MS4MRB**
I103 **MS4SC**
I112 **MS4XL** (INCH)
I108 **MS4XL**
I131 **MS4XLB** (INCH)
I097 **MSJHD**
I094 **MSMHD**
I140 **MSMHDRB**
I101 **MSMHZD** (INCH)
I099 **MSMHZD**
I093 **MSSHD**
I201 **VC2C**
I169 **VC2ESB**
I171 **VC2PSB**
I172 **VC2PSBP**
I177 **VC3MB**
I187 **VC4JRB**
I179 **VC4MB**
I197 **VC4STB**
I165 **VC6MH**
I166 **VC8MH**
I192 **VCHFRB** (INCH)
I189 **VCHFRB**
I190 **VCHFRB**(TAPER NECK)
I162 **VCLD**
I161 **VCMDSC**
I163 **VCMH**
I194 **VCMHDRB**
I181 **VCPSRB**
I185 **VCPSRB**(TAPER NECK)
I167 **VCSFPR**
I174 **VCXB**
I255 **VF2MV**
I282 **VF2SB**(INCH)
I279 **VF2SB**
I284 **VF2SDB**
I285 **VF2SDBL**
I278 **VF2SSB**
I277 **VF2WB**
I252 **VF2XL**
I295 **VF2XLB**(INCH)
I289 **VF2XLB**
I288 **VF2XLBS**
I297 **VF3XB**
I302 **VF4MB**
I257 **VF4MV**
I304 **VF4SVB**
I263 **VF6MHV**
I264 **VF6MHVCH**
I325 **VF6MHVRB**
I327 **VF6MHVRBCH**
I274 **VF6SVRCH**
I265 **VF8MHVCH**
I329 **VF8MHVRBCH**
I306 **VFFDRB**
I313 **VFHVRB**(INCH)
I307 **VFHVRB**
I315 **VFHVRB**(TAPER NECK)
I261 **VFJHV**
I269 **VFMD**(INCH)
I267 **VFMD**
I322 **VFMDRB**
I275 **VFMFPR**
I258 **VFMHV**
I260 **VFMHVCH**
I319 **VFMHVRB**
I324 **VFMHVRBCH**
I266 **VFSD**
I321 **VFSDRB**
I271 **VFSFPR**
I273 **VFSFPRCH**
I237 **VQ4SVB**(INCH)
I235 **VQ4SVB**
I227 **VQJHV**(INCH)
I225 **VQJHV**
I222 **VQMHV**(INCH)
I218 **VQMHV**
I244 **VQMHVRB**(INCH)
I239 **VQMHVRB**
I249 **VQMHVRBF**(INCH)
I247 **VQMHVRBF**
I208 **VQMHZV**(INCH)
I202 **VQMHZV**
I215 **VQMHZVOH**(INCH)
I212 **VQMHZVOH**
I232 **VQSVR**
I229 **VQXL**

PRODUCT CODE CORRESPONDENCES

PRODUCT CODE OF END MILLS



End mill names

VQ : Smart Miracle end mills
VF : Impact Miracle end mills
MS : Mstar end mills
VC : Miracle end mills
CBN : CBN end mills
C : Carbide end mills
DFC : Diamond coated end mills
DF : Diamond coated end mills
DS : Diamond star end mills

Number of flutes

2 : 2 flute
3 : 3 flute
4 : 4 flute
5 : 5 flute
6 : 6 flute
8 : 8 flute

Flute length

ES : Extra short
S : Short
M : Medium
J : Semi long
L : Long
X : Taper neck
XL : Long neck

Features

S : General use
C : Center cut
B : Ball nose
A : For light alloy
D : For heavy duty
V : Irregular helix flutes
RB : Corner radius
H : High helix 45°
HH : High helix 60°
R : Roughing
FPR : Fine roughing
T : Taper
TB : Taper ball nose
CH : Coolant hole

Dimensions

D★★★ : Diameter
ex.
D0050 →ϕ0.5 mm
D0500 →ϕ5 mm

R★★★ : Radius of ball nose
ex.
R0050 → R0.5
R0500 → R5

Others

S★★ : Shank diameter
N★★ : Neck length
T★★ : Taper angle one side
L★★ : Length of cut
A★★ : Overall length

SYMBOL DESCRIPTIONS

Tool material



Ultra micro grain carbide



Cubic boron nitride

Tolerances



Outside diameter tolerance
Indicates the diameter tolerance of the end mill.



R tolerance
Indicates the radius tolerance of a ball nose end mill.



R tolerance
Indicates the radial tolerance of an end mill with a corner radius.



Tolerance of Taper angle
Indicates the tolerance of the taper angle.



Tolerance of Point angle
Indicates the tolerance of the point angle.



Tolerance of Shank
Indicates the tolerance of the end mill shank.

Coating



SMART MIRACLE Coating
New smooth and dense coating technology for high efficiency milling of difficult to cut materials.



IMPACT MIRACLE Coating
Single phase nano crystal coating technology for higher film hardness and heat resistance.



MIRACLE Coating



Original developed (Al, Ti)N coating



Diamond Coating



Diamond Coating

Angle, sharp corner edge and gash land



Helix angle
Indicates the helix angle of the end mill.



Sharp corner edge
Indicates that the end mill has a sharp corner edge.



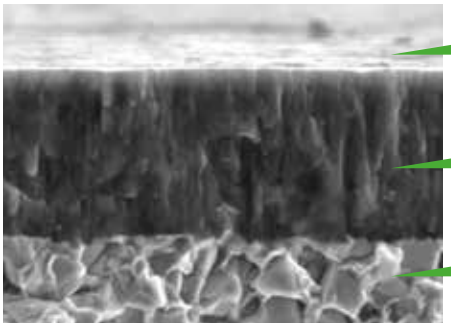
Gash land
Indicates that the end mill cutting edge has a gash land.

COATING TECHNOLOGY



VQ SMART MIRACLE® Coating

Newly-developed (Al,Cr)N coating with improved wear resistance.
The smoothig treatment of the coating layer reduces the cutting resistance and improves chip discharge significantly. This next-generation coating offers longer tool life and higher efficiency in machining difficult-to-cut materials.



Smoothed surface"Zero-μ Surface"

Newly developed(Al,Cr)N coating

Super fine grade substrate



SMART MIRACLE Coating

ZERO- μ Surface

The original surface treatment technology offers smooth coatng layer. A good balance of smooth surface and sharpe edge allows smooth chip discharge and reduces the cutting resistance. Machining efficiency and tool life is improved.

MIRACLE SIGMA

VF ÍMPACT MIRACLE Coating

For higher hardness, higher speed and longer tool life!

In comparison with the conventional coating single-phase, nano crystal coating technology offers higher coating hardness and heat resistance.
When machining hardened steels, it can be seen that the IMPACT MIRACLE coating offers a lower coefficient of friction and prevents abnormal damage such as chipping.



FEATURES OF IMPACT MIRACLE COATING

	ÍMPACT MIRACLE	(Al,Ti,Si)N	(Al,Ti)N
Hardness	3700HV	3200HV	2800HV
Adhesion	100N	80N	80N
Oxidation temperature	2370F	2010F	1540F
Coefficient of friction	0.48	0.53	0.58

1) Adhesion : Measured by critical load scratch test.
2) Coefficient of friction : Measured by ball-on-disk method.
(Counter gear : AISI D2 60HRC)

VC MIRACLE Coating (Al,Ti)N

MIRACLE coating for high speed milling.

Miracle coating is produced by adding Al to the existing TiN coating.
This coating layer consists of a compound solid solution of (Al,Ti)N.
This results in improving the heat resistance during cutting, and thus delivers high performance in high hardness material machining and high speed dry cutting. It also has the high adhesion strength for the cemented carbide substrate, and extends the tool life significantly compared to conventional products.

ENDMILL SERIES (FOR FERROUS MATERIAL)

APPLICATION RANGE

Work material		High performance	General
P	Carbon Steel Alloy Steel	SMART MIRACLE	MS
M	Austenitic Stainless Steel		
S	Titanium Alloy Heat Resistant Alloy		
H	Hardened steel	IMPACT MIRACLE	

DFC Diamond Coating

Proprietary CVD diamond coating produces excellent wear resistance and smooth hole surface.

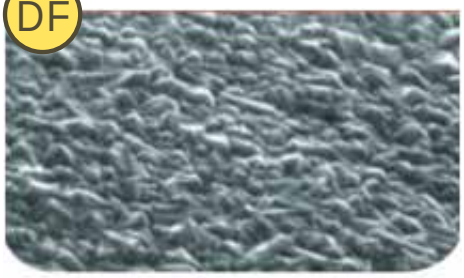
The newly developed CVD diamond coated carbide material achieves outstanding abrasion resistance and smoothness due to a proprietary fine multilayer diamond crystal control technology.

DF Diamond Coating

Diamond coating for non-ferrous and new non-metal materials.

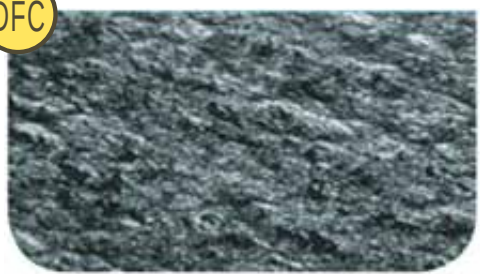
Due to Mitsubishi's unique plasma chemical vapor deposition (CVD) coating technology, the coating hardness, which is similar to diamond, has been combined with excellent adhesion strength to the carbide substrate(s) to provide long tool life.
DF end mill series are suitable for graphite machining.

DF



Large crystal coating provide excellent wear resistance against graphite

DFC



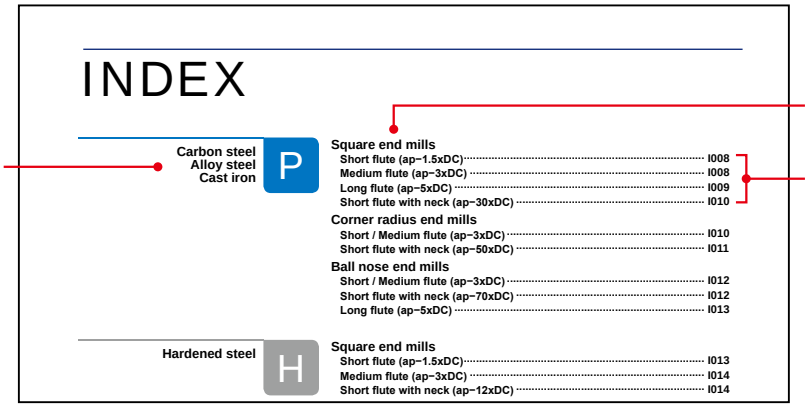
Fine crystal coating provide smooth surface and sharp cutting edge. DFC is suitable for machining FRP materials.

TOOL NAVI

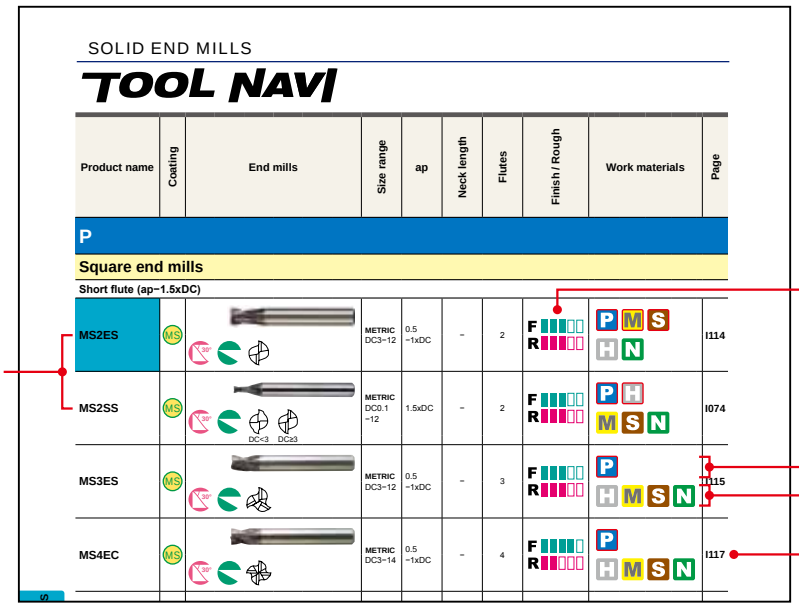
HOW TO USE TOOL NAVI

3 steps to find the correct tool and cutting data.

STEP1 Choose work material, end mill type and cutting length

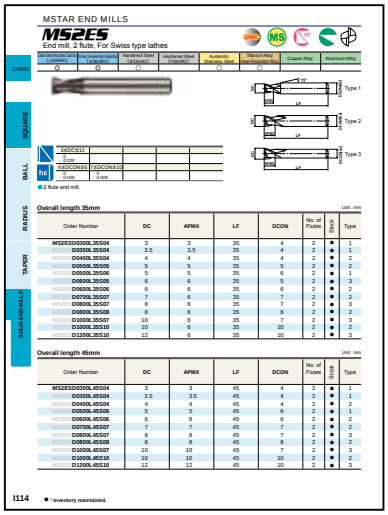


STEP2 Choose end mill

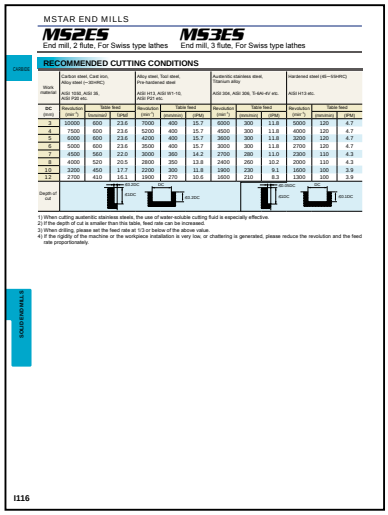


STEP3 Choose size and cutting condition

End mill size



Cutting conditions



INDEX

Carbon steel / Alloy steel / Cast iron — P

Square end mills
- Short flute (ap−1.5xDC) ····· I008
- Medium flute (ap−3xDC) ····· I008
- Long flute (ap−5xDC) ····· I009
- Short flute with neck (ap−30xDC) ····· I010

Corner radius end mills
- Short / Medium flute (ap−3xDC) ····· I010
- Short flute with neck (ap−50xDC) ····· I011

Ball nose end mills
- Short / Medium flute (ap−3xDC) ····· I012
- Short flute with neck (ap−70xDC) ····· I012
- Long flute (ap−5xDC) ····· I013

Hardened steel — H

Square end mills
- Short flute (ap−1.5xDC) ····· I013
- Medium flute (ap−3xDC) ····· I014
- Short flute with neck (ap−12xDC) ····· I014

Corner radius end mills
- Short / Medium flute (ap−3xDC) ····· I014
- Short flute with neck (ap−50xDC) ····· I014

Ball nose end mills
- Short / Medium flute (ap−3xDC) ····· I015
- Short flute with neck (ap−70xDC) ····· I016

Austenitic Stainless steel — M

Ti alloy / Ni-base alloy — S

Square end mills
- Short flute (ap−1.5xDC) ····· I017
- Medium flute (ap−3xDC) ····· I017
- Long flute (ap−5xDC) ····· I019
- Short flute with neck (ap−30xDC) ····· I019

Corner radius end mills
- Short / Medium flute (ap−3xDC) ····· I020
- Short flute with neck (ap−50xDC) ····· I021

Ball nose end mills
- Short / Medium flute (ap−3xDC) ····· I021
- Short flute with neck (ap−20xDC) ····· I021

Copper alloy / Aluminum alloy — N

Square end mills
- Short flute (ap−1.5xDC) ····· I022
- Medium flute (ap−3xDC) ····· I022
- Long flute (ap−5xDC) ····· I022
- Short flute with neck (ap−30xDC) ····· I023

Corner radius end mills
- Short / Medium flute (ap−3xDC) ····· I023
- Short flute with neck (ap−50xDC) ····· I023

Ball nose end mills
- Short / Medium flute (ap−3xDC) ····· I024
- Short flute with neck (ap−50xDC) ····· I024

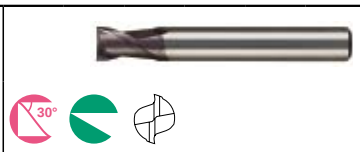
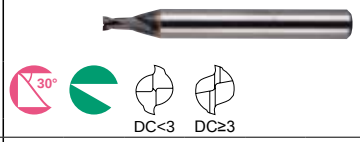
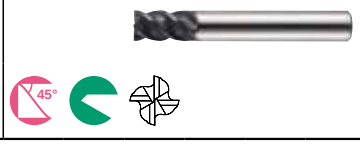
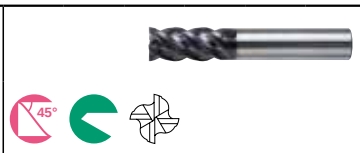
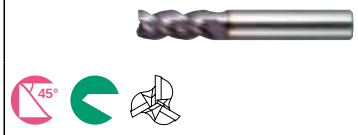
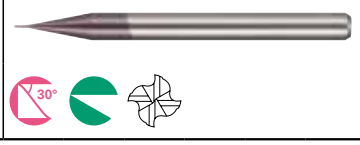
Graphite / FRP — G

Square end mills
- Long flute (ap−5xDC) ····· I024
- Short flute with neck (ap−10xDC) ····· I025

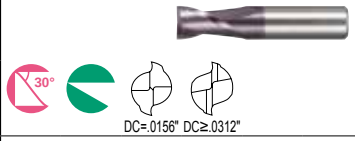
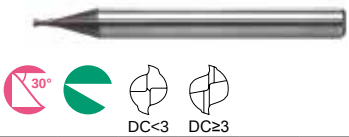
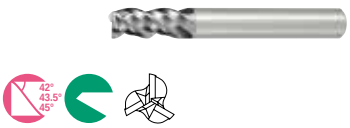
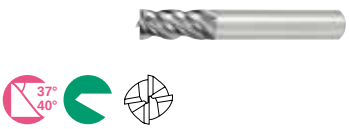
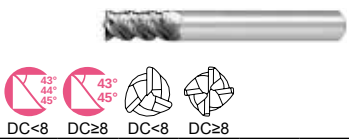
Corner radius end mills
- Short flute with neck (ap−30xDC) ····· I025

Ball nose end mills
- Short / Medium flute (ap−3xDC) ····· I025
- Short flute with neck (ap−50xDC) ····· I025

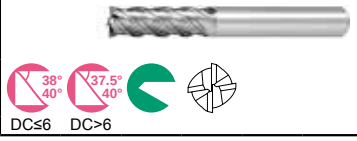
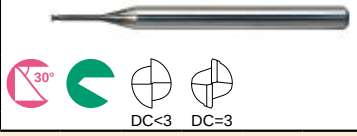
TOOL NAVI

Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
P									
Square end mills									
Short flute (ap−1.5xDC)									
MS2ES	MS		METRIC DC3−12	0.5 −1xDC	−	2	F R	P M S H N	I114
MS2SS	MS		METRIC DC0.1 −12	1.5xDC	−	2	F R	P H M S N	I074
MS3ES	MS		METRIC DC3−12	0.5 −1xDC	−	3	F R	P H M S N	I115
MS4EC	MS		METRIC DC3−14	0.5 −1xDC	−	4	F R	P H M S N	I117
MS4SC	MS		METRIC DC1−12	1.5xDC	−	4	F R	P H M S N	I103
MSSHD	MS		METRIC DC3−20	1.5xDC	−	4	F R	P M S H	I093
Medium flute (ap−3xDC)									
MSMHD	MS		METRIC DC2−25	2 −3.1xDC	−	4	F R	P M S H	I094
MSMHZD	MS		METRIC DC1−20 INCH DC.0625 −.7500	1.6 −2.5xDC	−	3	F R	P M S H N	METRIC I099 INCH I101
DS4MC	MS		INCH DC.0156 −1.2500	1.3 −3.6xDC	−	4	F R	P H M S N	I042

∗ ap : Depth of cut
∗ DC : Dia.

Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
DS3MC	MS		**INCH** DC.0156 −1.2500	2 −3.6xDC	−	3	F R	P H M S N	**I040**
DS2SS	MS	 DC=.0156" DC≥.0312"	**INCH** DC.0156 −.7500	1.2 −2.5xDC	−	2	F R	P H M S N	**I036**
MS2MS	MS	 DC<3 DC≥3	**METRIC** DC0.2 −20	2xDC	−	2	F R	P H M S N	**I075**
MS2JS	MS	 DC<3 DC≥3 DC<3 DC≥3	**METRIC** DC0.1 −12	3xDC	−	2	F R	P H M S N	**I080**
VQMHZV MIRACLE SIGMA	VQ		**METRIC** DC1−20 **INCH** DC.0625 −.5000	1.6 −2.5xDC	−	3	F R	P M S N	METRIC **I202** INCH **I208**
VQMHV MIRACLE SIGMA	VQ		**METRIC** DC2−25 **INCH** DC.1250 −.5000	2 −2.8xDC	−	4	F R	P M S N	METRIC **I218** INCH **I222**
NEW **VQSVR** MIRACLE SIGMA	VQ	 DC<8 DC≥8 DC<8 DC≥8	**METRIC** DC3−20	1.8 −2.2xDC	−	4	F R	P M S N	**I232**
Long flute (ap−5xDC)									
MSJHD	MS		**METRIC** DC2−20	2.8 −4xDC	−	4	F R	P M S H	**I097**
DS4LC	MS		**INCH** DC.1250 −1.0000	3 −8xDC	−	4	F R	P H M S N	**I043**
MS2LS	MS		**METRIC** DC0.2 −12	4xDC	−	2	F R	P H M S N	**I082**

TOOL NAVI

Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
P									
Square end mills									
Long flute (ap−5xDC)									
MS4JC	MS	 30° DC<3 DC≥3 DC<3 DC≥3	METRIC DC1−12	4xDC	−	4	F R	P H M S N	I106
NEW VQJHV MIRACLE SIGMA	VQ	 38° 40° 37.5° 40° DC≤6 DC>6	METRIC DC2−20 INCH DC.1250 −.5000	3.3 −4xDC	−	4	F R	P M S N	METRIC I225 INCH I227
Short flute with neck (ap−30xDC)									
MS2XL	MS	 30° DC<0.4 DC≥0.4	METRIC DC0.2 −6 INCH DC.0156 −.2500	1.3 −1.6xDC	2.5 −30xDC	2	F R	P H M S N	METRIC I084 INCH I091
MS2XL6	MS	 30°	METRIC DC0.3 −2.5	1.5 −2.7xDC	2.5 −5xDC	2	F R	P H M S N	I088
MS4XL	MS	 30°	METRIC DC1−10 INCH DC.0625 −.2500	1xDC	2.6 −16.2xDC	4	F R	P H M S	METRIC I108 INCH I112
VF2XL	VF	 30° DC<3 DC=3	METRIC DC0.1 −3	1.5 −1.7xDC	2.5 −12.5xDC	2	F R	P H	I252
Corner radius end mills									
Short / Medium flute (ap−3xDC)									
MSMHDRB	MS	 45°	METRIC DC2−20	2 −2.8xDC	−	4	F R	P M S H	I140
DS4SRB	MS	 30°	INCH DC.1250 −.7500	1.2 −2xDC	−	4	F R	P H M S N	I055

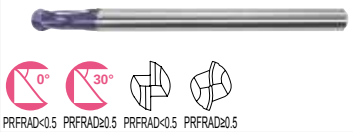
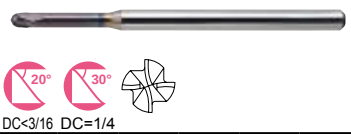
★ ap : Depth of cut
★ DC : Dia.

SOLID END MILLS

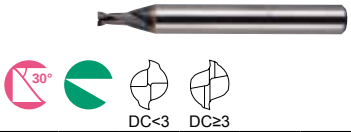
Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
MS2MRB	MS	 30° DC<3 DC≥3	**METRIC** DC1−12	2xDC	−	2	F R	P H M S	**I132**
DS4MRB	MS	 30°	**INCH** DC.1250 −.7500	2 −3xDC	−	4	F R	P H M S N	**I056**
MS4MRB	MS	 30°	**METRIC** DC3−20	1.9 −2.8xDC	−	4	F R	P H M S	**I137**
VQMHVRB MIRACLE SIGMA	VQ	 37° 40°	**METRIC** DC2−20 **INCH** DC.1250 −.5000	2 −2.8xDC	−	4	F R	P M S N	**METRIC I239** **INCH I244**
Short flute with neck (ap−50xDC)									
VFHVRB	VF	 43° 45°	**METRIC** DC1−16 **INCH** DC.1250 −.5000	1 −1.6xDC	2.6 −50xDC	4	F R	P H M S	**METRIC I307** **INCH I313**
VCPSRB [High Precision]	VC	 30° DC≤1.5 DC≥2	**METRIC** DC0.6 −12	1xDC	2.6 −13.3xDC	2 4	F R	P H M S	**I181**
MS2XLRB	MS	 30° DC<3 DC≥3	**METRIC** DC1−6	1xDC	2−50xDC	2	F R	P H M S N	**I135**
CBN2XLRB	CBN	 0°	**METRIC** DC0.5 −2	0.6xDC	3−6xDC	2	F R	P H	**I349**

SOLID END MILLS

TOOL NAVI

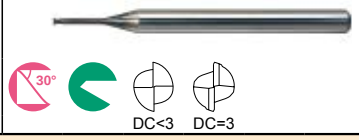
Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
P									
Ball nose end mills									
Short / Medium flute (ap−3xDC)									
MS2SB	MS		**METRIC** PRFRAD 0.1−6	1.5 −1.7xDC	−	2	F R	P H M S	I119
DS2SB	MS		**INCH** DC.0156 −.7500	1.2 −2.5xDC	−	2	F R	P H M S	I044
MS2MB	MS		**METRIC** PRFRAD 0.25−6	1.8 −3xDC	−	2	F R	P H M S	I121
VF2SDB	VF		**METRIC** PRFRAD 0.5−10	1−2xDC	−	2	F R	P H	I284
VF2SDBL	VF		**METRIC** PRFRAD 0.5−10	1−2xDC	−	2	F R	P H	I285
VQ4SVB MIRACLE SIGMA	VQ		**METRIC** PRFRAD 1−6 **INCH** PRFRAD .0625−.2500	1.5xDC	−	4	F R	P M S N	METRIC I235 INCH I237
VC2PSBP [High Precision]	VC	 PRFRAD<0.5 PRFRAD≥0.5 PRFRAD<0.5 PRFRAD≥0.5	**METRIC** PRFRAD 0.02−6	1−2xDC	−	2	F R	P H M S	I172
Short flute with neck (ap−70xDC)									
MS2XLB	MS		**METRIC** PRFRAD 0.1−3 **INCH** PRFRAD .0078−.1250	1xDC	2 −20xDC	2	F R	P H M S N	METRIC I123 INCH I129
MS4XLB	MS	 DC<3/16 DC=1/4	**INCH** PRFRAD .0313−.1250	1xDC	6 −12xDC	4	F R	P H M S	I131

∗ ap : Depth of cut
∗ DC : Dia.
∗ PRFRAD : Radius of ball nose

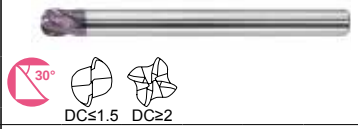
Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
VF2XLB	VF		**METRIC** PRFRAD 0.1−3 **INCH** PRFRAD .0156−.1250	0.8xDC	2.5 −20xDC	2	F R	P H S	METRIC I289 INCH I295
VF2XLBS	VF		**METRIC** PRFRAD 0.2−1	0.8xDC	2.5 −12xDC	2	F R	P H S	I288
VF3XB	VF		**METRIC** PRFRAD 0.4−2.5	0.6 −0.9xDC	6.6 −70xDC	3	F R	P H S	I297
VF2WB	VF		**METRIC** PRFRAD 1−3	220°	2−3xDC	2	F R	P M S H	I277
CBN2XLB	CBN		**METRIC** PRFRAD 0.2−1	0.6 −0.8xDC	0.85 −4xDC	2	F R	P H	I347
Long flute (ap−5xDC)									
DS2LB	MS		**INCH** DC.1250 −1.0000	3 −8xDC	−	2	F R	P H M S	I045
DS4LB	MS		**INCH** DC.1250 −1.0000	3 −8xDC	−	4	F R	P H M S	I048
H									
Square end mills									
Short flute (ap−1.5xDC)									
MS2SS	MS	 DC<3 DC≥3	**METRIC** DC0.1 −12	1.5xDC	−	2	F R	P H M S N	I074

SOLID END MILLS

TOOL NAVI

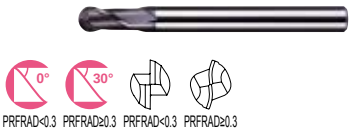
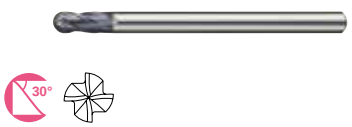
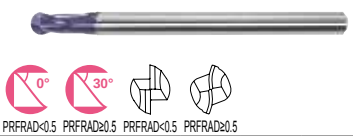
Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
H									
Square end mills									
Medium flute (ap−3xDC)									
VFSD	VF		METRIC DC1−12	2xDC	−	4 6	F R	P H	I266
VFMD	VF		METRIC DC1−25 INCH DC.0313 −.5000	2 −3.5xDC	−	4 6	F R	P H	METRIC I267 INCH I269
VF2MV	VF		METRIC DC0.5 −6	2.5xDC	−	2	F R	P H	I255
VF4MV	VF		METRIC DC6−20	2.5xDC	−	4	F R	P H	I257
Short flute with neck (ap−12xDC)									
VF2XL	VF		METRIC DC0.1 −3	1.5 −1.7xDC	2.5 −12.5xDC	2	F R	P H	I252
Corner radius end mills									
Short / Medium flute (ap−3xDC)									
NEW VFSDRB	VF		METRIC DC3−12	1xDC	−	6	F R	P H	I321
NEW VFMDRB	VF		METRIC DC3−20	2.2 −3.3xDC	−	6	F R	P H	I322
Short flute with neck (ap−50xDC)									
VFHVRB	VF		METRIC DC1−16 INCH DC.1250 −.5000	1 −1.6xDC	2.6 −50xDC	4	F R	P H M S	METRIC I307 INCH I313

* ap : Depth of cut
* DC : Dia.
* PRFRAD : Radius of ball nose

Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
VCPSRB [High Precision]	VC		**METRIC** DC0.6 –12	1xDC	2.6 –13.3xDC	2 4	F R	P H M S	I181
NEW **VFFDRB**	VF		**METRIC** DC3–12	0.06DC	3DC	4 6	F R	H P M	I306
CBN2XLRB	CBN		**METRIC** DC0.5 –2	0.6xDC	3–6xDC	2	F R	P H	I349

Ball nose end mills

Short / Medium flute (ap–3xDC)

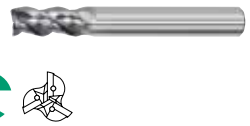
VF2SB	VF		**METRIC** PRFRAD 0.1–10 **INCH** PRFRAD .0156– .2500	1–2xDC	–	2	F R	P H M S	METRIC I279 INCH I282
VF2SSB	VF		**METRIC** PRFRAD 0.5–6	1xDC	–	2	F R	P H M S	I278
VF2SDB	VF		**METRIC** PRFRAD 0.5–10	1–2xDC	–	2	F R	P H	I284
VF2SDBL	VF		**METRIC** PRFRAD 0.5–10	1–2xDC	–	2	F R	P H	I285
VF4MB	VF		**METRIC** PRFRAD 0.5–6	1.8 –3xDC	–	4	F R	P H M S	I302
VC2PSBP [High Precision]	VC		**METRIC** PRFRAD 0.02–6	1–2xDC	–	2	F R	P H M S	I172

SOLID END MILLS

TOOL NAVI

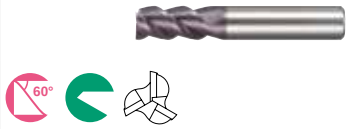
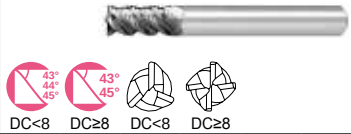
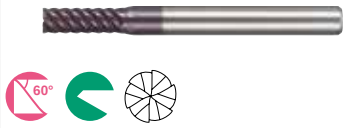
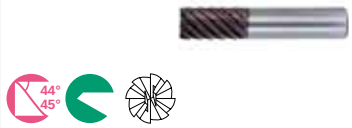
Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
H									
Ball nose end mills									
Short flute with neck (ap−70xDC)									
VF2XLB	VF		**METRIC** PRFRAD 0.1−3 **INCH** PRFRAD .0156−.1250	0.8xDC	2.5 −20xDC	2	F ■■■□□ R ■■□□□	P H S	METRIC **I289** INCH **I295**
VF2XLBS	VF		**METRIC** PRFRAD 0.2−1	0.8xDC	2.5 −12xDC	2	F ■■■□□ R ■■□□□	P H S	**I288**
VF3XB	VF		**METRIC** PRFRAD 0.4 −2.5	0.6 −0.9xDC	6.6 −70xDC	3	F ■■■□□ R ■□□□□	P H S	**I297**
CBN2XLB	CBN		**METRIC** PRFRAD 0.2−1	0.6 −0.8xDC	0.85 −4xDC	2	F ■■■■■ R □□□□□	P H	**I347**

★ ap : Depth of cut
★ DC : Dia.
★ PRFRAD : Radius of ball nose

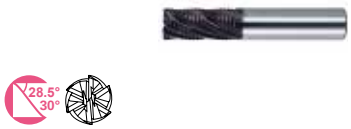
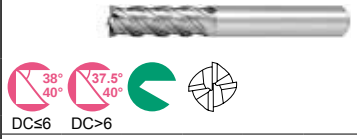
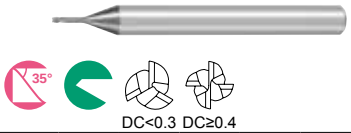
Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
M									
S									
Square end mills									
Short flute (ap−1.5xDC)									
MSSHD	MS		**METRIC** DC3−20	1.5xDC	−	4	F R	P M S H	I093
DS3SH-SS	MS		**INCH** DC.1250 −.7500	1.2 −2xDC	−	3	F R	M S P H	I060
MS2ES	MS		**METRIC** DC3−12	0.5 −1xDC	−	2	F R	P M S H N	I114
Medium flute (ap−3xDC)									
MSMHD	MS		**METRIC** DC2−25	2 −3.1xDC	−	4	F R	P M S H	I094
MSMHZD	MS		**METRIC** DC1−20 **INCH** DC.0625 −.7500	1.6 −2.5xDC	−	3	F R	P M S H N	**METRIC** I099 **INCH** I101
VQMHZV MIRACLE SIGMA	VQ		**METRIC** DC1−20 **INCH** DC.0625 −.5000	1.6 −2.5xDC	−	3	F R	P M S N	**METRIC** I202 **INCH** I208
VQMHZVOH MIRACLE SIGMA	VQ		**METRIC** DC6−16 **INCH** DC.2500 −.5000	1.9 −2.4xDC	−	3	F R	P M S N	**METRIC** I212 **INCH** I215
VQMHV MIRACLE SIGMA	VQ		**METRIC** DC2−25 **INCH** DC.1250 −.5000	2 −2.8xDC	−	4	F R	P M S N	**METRIC** I218 **INCH** I222

SOLID END MILLS

TOOL NAVI

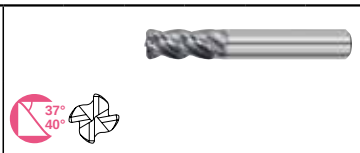
Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
M									
S									
Square end mills									
Medium flute (ap−3xDC)									
DS3MHH60	MS		**INCH** DC.1250 −1.0000	1.5 −3.2xDC	−	3	F ■■■□□ R ■■■□□	M S P H	I049
NEW **VQSVR** MIRACLE SIGMA	VQ	 DC<8 DC≥8 DC<8 DC≥8	**METRIC** DC3−20	1.8 −2.2xDC	−	4	F □□□□□ R ■■■■■	P M S N	I232
VFMHVCH	VF		**METRIC** DC16, DC20	2.2xDC	−	4	F ■■■■□ R ■■■■□	M S P H	I260
DS5MH-SS	MS		**INCH** DC.2500 −.7500	2.2 −3xDC	−	5	F ■■■■□ R □□□□□	M S P H	I062
DS6MHH60	MS		**INCH** DC.1250 −1.0000	1.5 −3.2xDC	−	6	F ■■■■■ R □□□□□	M S P H	I050
VF6MHV	VF		**METRIC** DC6−20	1.9 −2.4xDC	−	6	F ■■■■■ R □□□□□	M S P H	I263
VF6MHVCH	VF		**METRIC** DC10 −20	1.9 −2.2xDC	−	6	F ■■■■■ R □□□□□	M S P H	I264
VF8MHVCH	VF		**METRIC** DC16, DC20	1.9 −2xDC	−	8	F ■■■■■ R □□□□□	M S P H	I265

⁎ ap : Depth of cut
⁎ DC : Dia.

Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
VFSFPRCH	VF		**METRIC** DC16, DC20	1.9 −2.1xDC	−	4	F R	P M S H	I273
VF6SVRCH	VF		**METRIC** DC16, DC20	1.9 −2.1xDC	−	6	F R	P M S H	I274
VFMFPR	VF		**METRIC** DC5−20	2.8 −3.5xDC	−	4	F R	P M S H	I275
Long flute (ap−5xDC)									
VQJHV MIRACLE SIGMA	VQ	 DC≤6 DC>6	**METRIC** DC2−20 **INCH** DC.1250 −.5000	3.3 −4xDC	−	4	F R	P M S N	METRIC I225 INCH I227
MSJHD	MS		**METRIC** DC2−20	2.8 −4xDC	−	4	F R	P M S H	I097
DS5LH-SS	MS		**INCH** DC.2500 −.7500	4 −5xDC	−	5	F R	M S P H	I063
Short flute with neck (ap−30xDC)									
VQXL MIRACLE SIGMA	VQ	 DC<0.3 DC≥0.4	**METRIC** DC0.2 −1	1.5 −1.67xDC	2.5 −6xDC	3 4	F R	P M S H N	I229
MS2XL	MS	 DC<0.4 DC≥0.4	**METRIC** DC0.2 −6 **INCH** DC.0156 −.2500	1.3 −1.6xDC	2.5 −30xDC	2	F R	P H M S N	METRIC I084 INCH I091
MS2XL6	MS		**METRIC** DC0.3 −2.5	1.5 −2.7xDC	2.5 −5xDC	2	F R	P H M S N	I088

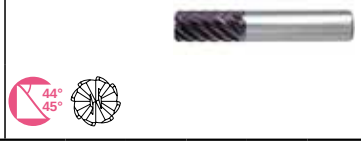
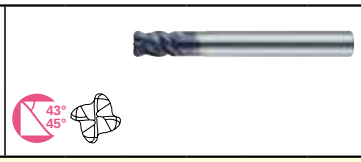
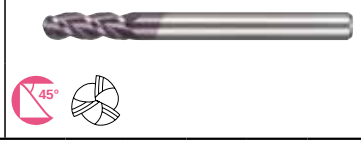
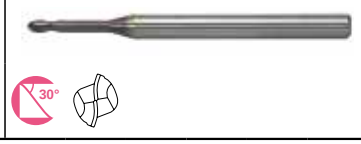
SOLID END MILLS

TOOL NAVI

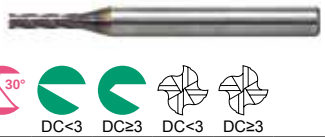
Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
M									
S									
Corner radius end mills									
Short / Medium flute (ap−3xDC)									
VQMHVRB MIRACLE SIGMA	VQ		METRIC DC2−20 INCH DC.1250 −.5000	2 −2.8xDC	−	4	F R	P M S N	METRIC I239 INCH I244
MSMHDRB	MS		METRIC DC2−20	2 −2.8xDC	−	4	F R	P M S H	I140
DS3MHRB-SS	MS		INCH DC.1250 −.7500	2.2 −3xDC	−	3	F R	M S P H	I067
VQMHVRBF MIRACLE SIGMA	VQ		METRIC DC6−16 INCH DC.2500 −.5000	2.2 −2.4xDC	−	4	F R	P S M	METRIC I247 INCH I249
VFMHVRBCH	VF		METRIC DC16 −20	2.2 −2.3xDC	−	4	F R	P M S H	I324
DS5SHRB-SS	MS		INCH DC.2500 −.7500	1.2 −1.5xDC	−	5	F R	M S P H	I068
VF6MHVRB	VF		METRIC DC6−20	1.9 −2.4xDC	−	6	F R	M S P H	I325
VF6MHVRBCH	VF		METRIC DC10 −20	1.9 −2.2xDC	−	6	F R	M S P H	I327

∗ ap : Depth of cut
∗ DC : Dia.
∗ PRFRAD : Radius of ball nose

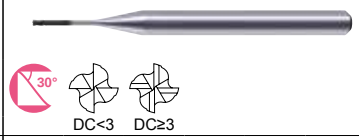
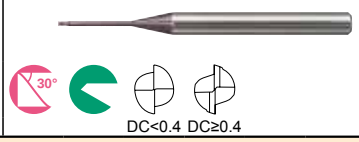
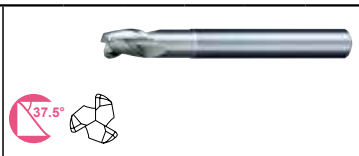
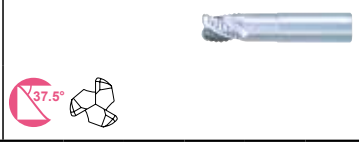
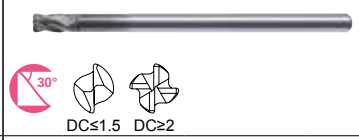
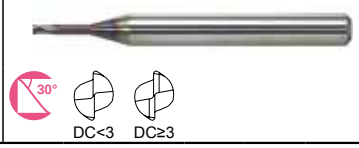
SOLID END MILLS

Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
VF8MHVRBCH	VF		**METRIC** DC16, DC20	1.9 −2xDC	−	8	F R	M S P H	**I329**
Short flute with neck (ap−50xDC)									
VFHVRB	VF		**METRIC** DC1−16 **INCH** DC.1250 −.5000	1 −1.6xDC	2.6 −50xDC	4	F R	P H M S	**METRIC** **I307** **INCH** **I313**
Ball nose end mills									
Short / Medium flute (ap−3xDC)									
VQ4SVB MIRACLE SIGMA	VQ		**METRIC** PRFRAD 1−6 **INCH** PRFRAD .0625−.2500	1.5xDC	−	4	F R	P M S N	**METRIC** **I235** **INCH** **I237**
DS3MHB-SS	MS		**INCH** DC.1250 −.7500	2.2 −3xDC	−	3	F R	M S P H	**I065**
Short flute with neck (ap−20xDC)									
VF2WB	VF		**METRIC** PRFRAD 1−3	220°	2−3xDC	2	F R	P M S H	**I277**
MS2XLB	MS		**METRIC** PRFRAD 0.1−3 **INCH** PRFRAD .0078−.1250	1xDC	2 −20xDC	2	F R	P H M S	**METRIC** **I123** **INCH** **I129**

TOOL NAVI

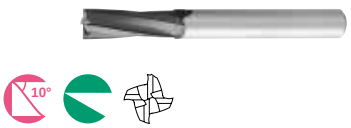
Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
N									
Square end mills									
Short flute (ap−1.5xDC)									
C3SA	—		METRIC DC10 −26	0.8 −1.3xDC	–	3	F R	N	I353
C2SA	—		METRIC DC3−20	0.9 −2xDC	–	2	F R	N	I351
CSRA	—		METRIC DC10 −25	1.1 −1.3xDC	–	3	F R	N	I359
Medium flute (ap−3xDC)									
C2MHA	—		METRIC DC3−25	1.5 −3xDC	–	2	F R	N	I355
Long flute (ap−5xDC)									
DF4JC	DF		METRIC DC3−12	3−4xDC	–	4	F R	N G	I330
MS4JC	MS	 DC<3 DC≥3 DC<3 DC≥3	METRIC DC1−12	4xDC	–	4	F R	P H M S N	I106

* ap : Depth of cut
* DC : Dia.

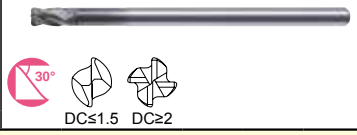
Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
Short flute with neck (ap−30xDC)									
DF4XL	DF		**METRIC** DC1−12	1.5xDC	2.5 −10.6xDC	4	F R	N G	I333
MS2XL	MS		**METRIC** DC0.2 −6 **INCH** DC.0156 −.2500	1.3 −1.6xDC	2.5 −30xDC	2	F R	P H M S N	METRIC I084 INCH I091
Corner radius end mills									
Short / Medium flute (ap−3xDC)									
C3SARB	—		**METRIC** DC12 −25	0.8 −1.3xDC	−	3	F R	N	I357
NEW **CSRARB**	—		**METRIC** DC10 −25	1.1 −1.3xDC	−	3	F R	N	I361
Short flute with neck (ap−50xDC)									
DFPSRB	DF		**METRIC** DC0.5 −12	1.3 −1.5xDC	3.3 −30xDC	2 4	F R	N G	I344
MS2XLRB	MS		**METRIC** DC1−6	1xDC	2 −50xDC	2	F R	P H M S N	I135

SOLID END MILLS

TOOL NAVI

Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
N									
Ball nose end mills									
Short / Medium flute (ap−3xDC)									
DF2MB	DF		**METRIC** PRFRAD 3−6	4.6 −5xDC	−	2	F ■■■□□ R ■■■□□	N G	I336
VQ4SVB MIRACLE SIGMA	VQ		**METRIC** PRFRAD 1−6 **INCH** PRFRAD .0625−.2500	1.5xDC	−	4	F ■■■■■ R ■■□□□	P M S N	METRIC I235 INCH I237
Short flute with neck (ap−50xDC)									
DF2XLB	DF		**METRIC** PRFRAD 0.2−2	1.2 −1.5xDC	2.5 −40xDC	2	F ■■■□□ R ■■■□□	N G	I338
DF3XB	DF		**METRIC** PRFRAD 0.5−2	1.5xDC	20 −50xDC	3	F ■■■□□ R ■□□□□	N G	I342
MS2XLB	MS		**METRIC** PRFRAD 0.1−3 **INCH** PRFRAD .0078−.1250	1xDC	2 −20xDC	2	F ■■■□□ R ■□□□□	P H M S N	METRIC I123 INCH I129
G									
Square end mills									
Long flute (ap−5xDC)									
DF4JC	DF		**METRIC** DC3−12	3−4xDC	−	4	F ■■■■□ R ■■■□□	N G	I332
DFC4JC	DFC		**METRIC** DC6−12	2.5 −3.8xDC	−	4	F ■■■■□ R ■■■■□	G	I330

* ap : Depth of cut
* DC : Dia.
* PRFRAD : Radius of ball nose

Product name	Coating	End mills	Size range	ap	Neck length	Flutes	Finish / Rough	Work materials	Page
DFCJRT	DFC		**METRIC** DC6–12	2.5 –3.8xDC	–	10 12	F R	G	I331
Short flute with neck (ap–10xDC)									
DF4XL	DF		**METRIC** DC1–12	1.5xDC	2.5 –10.6xDC	4	F R	N G	I333
Corner radius end mills									
Short flute with neck (ap–30xDC)									
DFPSRB	DF		**METRIC** DC0.5 –12	1.3 –1.5xDC	3.3 –30xDC	2 4	F R	N G	I344
Ball nose end mills									
Short / Medium flute (ap–3xDC)									
DF2MB	DF		**METRIC** PRFRAD 3–6	4.6 –5xDC	–	2	F R	N G	I336
Short flute with neck (ap–50xDC)									
DF2XLB	DF		**METRIC** PRFRAD 0.2–2	1.2 –1.5xDC	2.5 –40xDC	2	F R	N G	I338
DF3XB	DF		**METRIC** PRFRAD 0.5–2	1.5xDC	20 –50xDC	3	F R	N G	I342

END MILLS SELECTION CHART CARBIDE

Shape	Type	Number of Flutes	Coating	Order Number	Shape	Cutting Diameter Range	Work Material								Page	
							P		H		M	S	N		Dimensions	Cutting Conditions
							Carbon Steel, Alloy Steel, Cast Iron	Tool Steel, Pre-Hardened Steel, Hardened Steel	Hardened Steel (−55HRC)	Hardened Steel (55HRC−)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy		
SQUARE	General	2	MS	MS2SS	Short cut length, 2 flute	METRIC DC 0.1−12	◎	◎	○		○	○			I074	I077
			MS	DS2SS	Short, 2 flute	INCH DC .0156−.7500	◎	◎	○		○	○			I036	I072
			MS	MS2MS	Medium cut length, 2 flute	METRIC DC 0.2−20	◎	◎	○		○	○			I075	I077
			MS	DS2MS	Medium, 2 flute	INCH DC .0156−1.2500	◎	◎	○		○	○			I037	I072
			MS	MS2JS	Semi long cut length, 2 flute	METRIC DC 0.1−12	◎	◎	○		○	○			I080	I081
			MS	MS2LS	long cut length, 2 flute	METRIC DC 0.2−12	◎	◎	○		○	○			I082	I083
			MS	DS2LS	Long, 2 flute	INCH DC .1250−1.0000	◎	◎	○		○	○			I038	I072
		3	MS	DS3SC	Short, 3 flute	INCH DC .0156−.7500	◎	◎	○		○	○			I039	I072
			MS	DS3MC	Medium, 3 flute	INCH DC .0156−1.2500	◎	◎	○		○	○			I040	I072
		4	MS	MS4SC	Short cut length, 4 flute	METRIC DC 1−12	◎	◎	○		○	○			I103	I105
			MS	DS4SC	Short, 4 flute	INCH DC .0156−.7500	◎	◎	○		○	○			I041	I072
			MS	MS4MC	Medium cut length, 4 flute	METRIC DC 1−20	◎	◎	○		○	○			I104	I105
			MS	DS4MC	Medium, 4 flute	INCH DC .0156−1.2500	◎	◎	○		○	○			I042	I072
			MS	MS4JC	Semi long cut length, 4 flute	METRIC DC 1−12	◎	◎	○		○	○			I106	I107
			MS	DS4LC	Long, 4 flute	INCH DC .1250−1.0000	◎	◎	○		○	○			I043	I072

◎ : Excellent ○ : Good None : Not Recommended

Shape	Type	Number of Flutes	Coating	Order Number	Shape	Cutting Diameter Range	Work Material P: Carbon Steel, Alloy Steel, Cast Iron	P: Tool Steel, Pre-Hardened Steel, Hardened Steel	H: Hardened Steel (–55HRC)	H: Hardened Steel (55HRC–)	M: Austenitic Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	N: Copper Alloy	N: Aluminum Alloy	Page: Dimensions	Page: Cutting Conditions
SQUARE	High Helix	3	MS	MSMHZD	Medium cut length, 3 flute for drilling and slotting	METRIC DC 1–20 INCH DC .0625–.7500	◎	◎	○		◎	○			METRIC I099 INCH I101	METRIC I100 INCH I102
		4	MS	MSSHD	High power, Short cut length, 4 flute	METRIC DC 3–20	◎	◎	○		◎	◎			I093	I096
			MS	MSMHD	High power, Medium cut length, 4 flute	METRIC DC 2–25	◎	◎	○		◎	◎			I094	I096
			MS	MSJHD	High power, Semi long cut length, 4 flute	METRIC DC 2–20	◎	◎	○		◎	◎			I097	I098
	For Hardened Steel	2	MS	MS2MD	Medium cut length, 2 flute, Strong geometry type	METRIC DC 1–12	◎	◎	○		○	○			I078	I079
			VF	VF2MV	Medium cut length, 2 flute, Irregular helix flutes	METRIC DC 0.5–6	○	◎	◎	◎					I255	I256
		4	VF	VF4MV	Medium cut length, 4 flute, Irregular helix flutes	METRIC DC 6–20	○	◎	◎	◎					I257	I257
		4 6	VF	VFSD	Short cut length, For hardened materials	METRIC DC 1–12	○	◎	◎	◎					I266	I268
			VF	VFMD	Medium cut length, For hardened materials	METRIC DC 1–25 INCH DC .0313–.5000	○	◎	◎	◎					METRIC I267 INCH I269	METRIC I268 INCH I270
			VC	VCMDSC	Medium cut length, 4–6 flute	METRIC DC 0.5–3	○	◎	◎	◎					I161	I161
		6	VC	VCLD	Long cut length, 6 flute	METRIC DC 6–25	○	◎	◎	◎					I162	I162
	For Difficult-to-cut Material	3	VQ	VQMHZV MIRACLE SIGMA	Medium cut length, 3 flute, for drilling and slotting	METRIC DC 1–20 INCH DC .0625–.5000	◎	○			◎	◎	○		METRIC I202 INCH I208	METRIC I204 INCH I209
			VQ	VQMHZVOH MIRACLE SIGMA	Anti-vibration Smart miracle 3 flute for drilling and slotting with coolant holes	METRIC DC 6–16 INCH DC .2500–.5000	◎	○			◎	◎	○		METRIC I212 INCH I215	METRIC I213 INCH I216
			MS	DS3SH-SS	Short, 3 flute, For stainless steel	INCH DC .1250–.7500	○	○			◎	◎			I060	I072
			MS	DS3MH-SS	Medium, 3 flute, For stainless steel	INCH DC .1250–.7500	○	○			◎	◎			I061	I072

◎ : Excellent ○ : Good None : Not Recommended

END MILLS SELECTION CHART CARBIDE

Shape	Type	Number of Flutes	Coating	Order Number	Shape	Cutting Diameter Range	Work Material P: Carbon Steel, Alloy Steel, Cast Iron	P: Tool Steel, Pre-Hardened Steel, Hardened Steel	H: Hardened Steel (—55HRC)	H: Hardened Steel (55HRC—)	M: Austenitic Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	N: Copper Alloy	N: Aluminum Alloy	Page: Dimensions	Page: Cutting Conditions
SQUARE	For Difficult-to-cut Material	3	MS	DS3MHH60	High helix, Medium, 3 flute	INCH DC .1250—1.0000	○	○	○		◎	◎			I049	I072
		3 4	VQ	VQSVR NEW MIRACLE SIGMA	Roughing, Short cut length, 4 flute, Irregular helix flutes	METRIC DC 3—20	◎	○			◎	◎	○		I232	I233
			VC	VCMH	Medium cut length, 3—4 flute, High helix angle	METRIC DC 3—25	○	◎	○		◎	◎			I163	I164
		4	VQ	VQMHV MIRACLE SIGMA	Medium cut length, 4 flute, Irregular helix flutes	METRIC DC 2—25 INCH DC .1250—.5000	◎	○			◎	◎	○		METRIC I218 INCH I222	METRIC I219 INCH I223
			VQ	VQJHV NEW MIRACLE SIGMA	Semi long cut length, 4 flute, Irregular helix flutes	METRIC DC 2—20 INCH DC .1250—.5000	◎	○			◎	◎	○		METRIC I225 INCH I227	METRIC I226 INCH I228
			VF	VFMHV	Medium cut length, Irregular helix flutes	METRIC DC 2—20	○	○	○		◎	◎			I258	I259
			VF	VFMHVCH	Medium cut length, 4 flute, Irregular helix flutes, with multiple internal through coolant holes	METRIC DC 16, 20					◎	◎			I260	I260
			VF	VFJHV	Semi long cut length, 4 flute, Irregular helix flutes	METRIC DC 2—20	○	○	○		◎	◎			I261	I262
		5	MS	DS5MH-SS	Medium, 5 flute, For stainless steel	INCH DC .2500—.7500	○	○			◎	◎			I062	I072
			MS	DS5LH-SS	Long, 5 flute, For stainless steel	INCH DC .2500—.7500	○	○			◎	◎			I063	I072
		6	MS	DS6MHH60	High helix, Medium, 6 flute	INCH DC .1250—1.0000	○	○	○		◎	◎			I050	I072
			VC	VC6MH	Medium cut length, 6 flute, High helix angle	METRIC DC 6—25	◎	◎	○		◎	◎			I165	I166
			VF	VF6MHV	Medium cut length, 6 flute, Irregular helix flutes	METRIC DC 6—20	○	○	○		◎	◎			I263	I263
			VF	VF6MHVCH	Medium cut length, 6 flute, Irregular helix flutes with multiple internal through coolant holes	METRIC DC 10—20					◎	◎			I264	I264
		8	VF	VF8MHVCH	Medium cut length, 8 flute, Irregular helix flutes with multiple internal through coolant holes	METRIC DC 16, 20					◎	◎			I265	I265
			VC	VC8MH	Medium cut length, 8 flute, High helix angle	METRIC DC 20—25	◎	◎	○		◎	◎			I166	I166

◎ : Excellent ○ : Good None : Not Recommended

Shape	Type	Number of Flutes	Coating	Order Number	Shape	Cutting Diameter Range	Work Material P: Carbon Steel, Alloy Steel, Cast Iron	P: Tool Steel, Pre-Hardened Steel, Hardened Steel	H: Hardened Steel (−55HRC)	H: Hardened Steel (55HRC−)	M: Austenitic Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	N: Copper Alloy	N: Aluminum Alloy	Page: Dimensions	Page: Cutting Conditions
SQUARE	For Aluminum Alloy	2	–	C2MHA	2 flute, Medium cut length, Relieved neck	METRIC DC 3−25								◎	I355	I356
			–	C2SA	2 flute, Short cut length, Relieved neck	METRIC DC 3−20							○	◎	I351	I352
		3	–	C3SA	3 flute, Short cut length, Relieved neck	METRIC DC 10−26							○	◎	I353	I354
	For Swiss Type Lathes	2	MS	MS2ES	2 flute, For Swiss type lathes	METRIC DC 3−12	◎	◎	○		○	○			I114	I116
		3	MS	MS3ES	3 flute, For Swiss type lathes	METRIC DC 3−12	◎	◎	○		○	○			I115	I116
		4	MS	MS4EC	4 flute, For Swiss type lathes	METRIC DC 3−14	◎	◎	○		○	○			I117	I118
	For CFRP		DFC	DFC4JC	End mill, Semi long cutting length, 4 flute, For CFRP	METRIC DC 6−12	CFRP : ◎								I330	I330
	For Graphite		DF	DF4JC	Semi long cut length, 4 flute, For graphite	METRIC DC 3−12	Graphite : ◎ GFPR,CFPR : ○							○	I332	I332
			DF	DF4XL	Long neck, 4 flute, For graphite	METRIC DC 1−12								○	I333	I334
LONG NECK SQUARE	Rib Processing	2	MS	MS2XL	Short cut length, 2 flute, Long neck	METRIC DC 0.2−6 INCH DC .0156−.2500	◎	◎	○		○	○			METRIC I084 INCH I091	METRIC I087 INCH I092
			MS	MS2XL6	Short cut length, 2 flute, 6mm shank	METRIC DC 0.3−2.5	◎	◎	○		○	○			I088	I090
		4	MS	MS4XL	Short cut length, 4 flute, Long neck	METRIC DC 1−10 INCH DC .0625−.2500	◎	◎	○		○	○			METRIC I108 INCH I112	METRIC I111 INCH I113
	For Hardened Steel	2	VF	VF2XL	2 flute, Long neck	METRIC DC 0.1−3	○	◎	◎	◎					I252	I254
	For Small Parts	3 4	VQ	VQXL NEW MIRACLE SIGMA	4 flute, Long neck	METRIC DC 0.2−1	◎	○			◎	◎	○		I229	I230
SQUARE WITH CROSS-NECK	For CFRP	–	DFC	DFCJRT	Cross-nick type end mill, Semi long cutting length, For CFRP	METRIC DC 6−12	CFRP : ◎								I331	I331

◎ : Excellent ○ : Good None : Not Recommended

END MILLS SELECTION CHART CARBIDE

Shape	Type	Number of Flutes	Coating	Order Number	Shape	Cutting Diameter Range	Work Material P: Carbon Steel, Alloy Steel, Cast Iron	P: Tool Steel, Pre-Hardened Steel, Hardened Steel	H: Hardened Steel (−55HRC)	H: Hardened Steel (55HRC−)	M: Austenitic Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	N: Copper Alloy	N: Aluminum Alloy	Page: Dimensions	Page: Cutting Conditions
BALL	Curved Surface Machining	2	MS	MS2SB	Ball nose, Short, 2 flute	METRIC PRFRAD 0.1−6	◎	◎	○		○	○			I119	I122
			MS	DS2SB	Ball nose, Short, 2 flute	INCH DC .0156−.7500	◎	◎	○		○	○			I044	I073
			MS	MS2MB	Ball nose, Medium cut length, 2 flute	METRIC PRFRAD 0.25−6	◎	◎	○		○	○			I121	I122
			MS	DS2LB	Ball nose, Long, 2 flute	INCH DC .1250−1.0000	◎	◎	○		○	○			I045	I073
			VC	VC2ESB	Ball nose, Extra short cut length, 2 flute	METRIC PRFRAD 0.15−6	○	◎	◎	○	○	○			I169	I170
		3	MS	DS3SB	Ball nose, Short, 3 flute	INCH DC .1250−.7500	◎	◎	○		○	○			I046	I073
			VC	VC3MB	Ball nose, Medium cut length, 3 flute	METRIC PRFRAD 1−10	○	◎	◎	○	○	○			I177	I178
		4	MS	DS4SB	Ball nose, Short, 4 flute	INCH DC .0312−.7500	◎	◎	○		○	○			I047	I073
			MS	DS4LB	Ball nose, Long, 4 flute	INCH DC .1250−1.0000	◎	◎	○		○	○			I048	I073
	For Complex Geometry	2	VF	VF2WB	Wide ball nose, Medium neck, 2 flute	METRIC PRFRAD 1−3	◎	◎	○		◎	◎			I277	I277
	Strong		VF	VF2SDB	Ball nose, Short cut length, 2 flute, Strong geometry	METRIC PRFRAD 0.5−10	○	◎	◎	○					I284	I286
	For Hardened Steel		VF	VF2SSB	Ball nose, Short cut length, 2 flute, For hardened materials	METRIC PRFRAD 0.5−6	○	◎	◎	◎	○	○			I278	I281
			VF	VF2SB	Ball nose, Short cut length, 2 flute, For hardened materials	METRIC PRFRAD 0.1−10 INCH PRFRAD .0156−.2500	○	◎	◎	◎	○	○			METRIC I279 INCH I282	METRIC I281 INCH I283
		4	VF	VF4MB	Ball nose, Medium cut length, 4 flute	METRIC PRFRAD 0.5−6		◎	◎	◎	○	○			I302	I303
			VC	VC4MB	Ball nose, Medium cut length, 4 flute	METRIC PRFRAD 0.5−10	○	◎	◎	◎	○	○			I179	I180

◎ : Excellent ○ : Good None : Not Recommended

Shape	Type	Number of Flutes	Coating	Order Number	Shape	Cutting Diameter Range	Work Material P: Carbon Steel, Alloy Steel, Cast Iron	P: Tool Steel, Pre-Hardened Steel, Hardened Steel	H: Hardened Steel (—55HRC)	H: Hardened Steel (55HRC—)	M: Austenitic Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	N: Copper Alloy	N: Aluminum Alloy	Page: Dimensions	Page: Cutting Conditions
BALL	High Precision	2	VC	VC2PSB	Ball nose, Short cut length, 2 flute, High precision	METRIC PRFRAD 0.05—6	◎	◎	◎		○	○			I171	I173
			VC	VC2PSBP	Ball nose, Short cut length, 2 flute, Ultra high precision	METRIC PRFRAD 0.02—6	◎	◎	◎		○	○			I172	I173
	Long Shank		VF	VF2SDBL	Ball nose, Short cut length, 2 flute, Strong geometry, Long shank	METRIC PRFRAD 0.5—10	○	◎	◎	○					I285	I286
	Taper neck	3	VF	VF3XB	Ball nose, 3 flute, Taper neck	METRIC PRFRAD 0.4—2.5	○	◎	◎	◎	○	○			I297	I300
		2	VC	VCXB	Ball nose, 2 flute, Taper neck	METRIC PRFRAD 0.5—6	○	◎	◎	○	○	○			I174	I176
	For Difficult-to-cut Material	3	MS	DS3SHB-SS	Ball nose, Short, 3 flute, For stainless steel	INCH DC .1250—.7500	○	○			◎	◎			I064	I073
			MS	DS3MHB-SS	Ball nose, Medium, 3 flute, For stainless steel	INCH DC .1250—.7500	○	○			◎	◎			I065	I073
		4	VQ	VQ4SVB MIRACLE SIGMA	Ball nose, Short cut length, 4 flute, Variable curve	METRIC PRFRAD 1—6 INCH PRFRAD .0625—.2500	○	○			◎	◎	○		METRIC I235 INCH I237	METRIC I236 INCH I238
			VF	VF4SVB	Ball nose, Short cut length, 4 flute, Variable curve	METRIC PRFRAD 1—10	○	○			◎	◎			I304	I305
	For Graphite	2	DF	DF2MB	Ball nose, Medium cut length, 2 flute, For graphite	METRIC PRFRAD 3—6	Graphite : ◎ GFPR,CFPR : ○							○	I336	I337
			DF	DF2XLB	Ball nose, 2 flute, Long neck, For graphite	METRIC PRFRAD 0.1—3								○	I338	I340
		3	DF	DF3XB	Ball nose, 3 flute, Taper neck, For graphite	METRIC PRFRAD 0.5—2								○	I342	I343
LONG NECK BALL	Deep Slotting	2	VF	VF2XLB	Ball nose, Long neck, 2 flute, For hardened materials	METRIC PRFRAD 0.1—3 INCH PRFRAD .0156—.1250	○	◎	◎	◎		○			METRIC I289 INCH I295	METRIC I294 INCH I296
			VF	VF2XLBS	Ball nose, Long neck, 2 flute, Short shank	METRIC PRFRAD 0.2—1	○	◎	◎	◎					I288	I294
			MS	MS2XLB	Ball nose, Short cut length, 2 flute, Long neck	METRIC PRFRAD 0.1—3 INCH PRFRAD .0078—.1250	◎	◎	○		○	○			METRIC I123 INCH I129	METRIC I128 INCH I130
		4	MS	MS4XLB	Ball nose, 4 flute, Long neck	INCH PRFRAD .0313—.1250	◎	◎	○		○	○			I131	I131

◎ : Excellent ○ : Good None : Not Recommended

END MILLS SELECTION CHART CARBIDE

Shape	Type	Number of Flutes	Coating	Order Number	Shape	Cutting Diameter Range	Work Material P: Carbon Steel, Alloy Steel, Cast Iron	P: Tool Steel, Pre-Hardened Steel, Hardened Steel	H: Hardened Steel (—55HRC)	H: Hardened Steel (55HRC—)	M: Austenitic Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	N: Copper Alloy	N: Aluminum Alloy	Page: Dimensions	Page: Cutting Conditions
RADIUS	Corner Radius	2	MS	DS2SRB	Corner radius, Short, 2 flute	INCH DC .1250—.7500	◎	◎	○		○	○			I053	I072
			MS	MS2MRB	Corner radius, Medium cut length, 2 flute	METRIC DC 1—12	◎	◎	○		○	○			I132	I134
			MS	DS2MRB	Corner radius, Medium, 2 flute	INCH DC .1250—.7500	◎	◎	○		○	○			I054	I072
		4	MS	DS4SRB	Corner radius, Short, 4 flute	INCH DC .1250—.7500	◎	◎	○		○	○			I055	I072
			MS	MS4MRB	Corner radius, Medium cut length, 4 flute	METRIC DC 3—20	◎	◎	○		○	○			I137	I139
			MS	DS4MRB	Corner radius, Medium, 4 flute	INCH DC .1250—.7500	◎	◎	○		○	○			I056	I072
			VC	VC4JRB	Corner radius, Semi long cut length, 4 flute	METRIC DC 3—20	○	◎	◎	○	○	○			I187	I188
			MS	MSMHDRB	High power, Corner radius, Medium cut length, 4 flute	METRIC DC 2—20	◎	◎	◎		◎	◎			I140	I142
			VC	VCMHDRB	Corner radius, Medium cut length, 4 flute, High helix angle	METRIC DC 2—25	○	◎	◎	○	◎	◎			I194	I196
	For Difficult-to-cut Material	4 6	VF	VFFDRB NEW	Multi-task corner radius end mill for impact miracle high speed cutting	METRIC DC 3—12	○	○	◎	◎					I306	I306
		6	VF	VFSDRB NEW	IMPACT MIRACLE Corner radius end mill, 6 flute (S)	METRIC DC 3—12	○	◎	◎	◎					I321	I323
		6	VF	VFMDRB NEW	Corner radius, Medium cut length, 6 flute, For hardened materials	METRIC DC 3—20	○	◎	◎	◎					I322	I323
	For Hardened Steel	4	VF	VFHVRB	4 flute, Corner radius, Short cut length, Irregular helix flutes	METRIC DC 1—16 INCH DC .1250—.5000	◎	◎	◎	◎	○	○			METRIC I307 INCH I313	METRIC I309 INCH I314
	High Precision	2 4	VC	VCPSRB	Corner radius, Short cut length, 2-4 flute, High precision type	METRIC DC 0.6—12	◎	◎	◎	◎	○	○			I181	I184
	High Feed	4	VC	VCHFRB	High feed corner radius, 4 flute	METRIC DC 2—16 INCH DC .1250—.5000	◎	◎	◎	○		○			METRIC I189 INCH I192	METRIC I191 INCH I193

◎ : Excellent ○ : Good None : Not Recommended

Shape	Type	Number of Flutes	Coating	Order Number	Shape	Cutting Diameter Range	Work Material P: Carbon Steel, Alloy Steel, Cast Iron	P: Tool Steel, Pre-Hardened Steel, Hardened Steel	H: Hardened Steel (−55HRC)	H: Hardened Steel (55HRC−)	M: Austenitic Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	N: Copper Alloy	N: Aluminum Alloy	Page: Dimensions	Page: Cutting Conditions
RADIUS	For Difficult-to-cut Material	3	MS	DS3SHRB-SS	Corner radius, Short, 3 flute, For stainless steel	INCH DC .1250−.7500	○	○			◎	◎			I066	I072
			MS	DS3MHRB-SS	Corner radius, Medium, 3 flute, For stainless steel	INCH DC .1250−.7500	○	○			◎	◎			I067	I072
			MS	DS3MHHRB	Corner radius, High helix, Medium, 3 flute	INCH DC .1250−.6250	○	○	○		◎	◎			I070	I072
		4	VQ	VQMHVRB MIRACLE SIGMA	Corner radius, Medium cut length, 4 flute, Irregular helix flutes	METRIC DC 2−20 INCH DC .1250−.5000	◎	○			○	◎	○		METRIC I239 INCH I244	METRIC I241 INCH I245
			VQ	VQMHVRBF MIRACLE SIGMA	Corner radius, Medium cut length, 4 flute, Irregular helix flutes ,for finishing	METRIC DC 6−16 INCH DC .2500−.5000	○	○			○	◎			METRIC I247 INCH I249	METRIC I248 INCH I250
		4	VF	VFMHVRB	Corner radius, Medium cut length, 4 flute, Irregular helix flutes	METRIC DC 6−20	○	○	○		◎	◎			I319	I320
			VF	VFMHVRBCH	Corner radius, Medium cut length, 4 flute, Irregular helix flutes, with multiple internal through coolant holes	METRIC DC 16−20					◎	◎			I324	I324
		5	MS	DS5SHRB-SS	Corner radius, Short, 5 flute, For stainless steel	INCH DC .2500−.7500	○	○			◎	◎			I068	I072
			MS	DS5MHRB-SS	Corner radius, Medium, 5 flute, For stainless steel	INCH DC .2500−.7500	○	○			◎	◎			I069	I072
		6	MS	DS6MHHRB	Corner radius, High helix, Medium, 6 flute	INCH DC .1250−.6250	○	○	○		◎	◎			I071	I072
			VF	VF6MHVRB	Corner radius, Medium cut length, 6 flute, Irregular helix flutes	METRIC DC 6−20	○	○	○		◎	◎			I325	I326
			VF	VF6MHVRBCH	Corner radius, Medium cut length, 6 flute, Irregular helix flutes, with multiple internal through coolant holes	METRIC DC 10−20					◎	◎			I327	I328
		8	VF	VF8MHVRBCH	Corner radius, Medium cut length, 8 flute, Irregular helix flutes, with multiple internal through coolant holes	METRIC DC 16−20					◎	◎			I329	I329

◎ : Excellent ○ : Good None : Not Recommended

END MILLS SELECTION CHART CARBIDE

Shape	Type	Number of Flutes	Coating	Order Number	Shape	Cutting Diameter Range	Work Material P: Carbon Steel, Alloy Steel, Cast Iron	P: Tool Steel, Pre-Hardened Steel, Hardened Steel	H: Hardened Steel (—55HRC)	H: Hardened Steel (55HRC—)	M: Austenitic Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	N: Copper Alloy	N: Aluminum Alloy	Page: Dimensions	Page: Cutting Conditions
RADIUS	For Aluminum Alloy	2	—	DS2SRB-A○	Corner radius, Short, 2 flute, For aluminum alloys	INCH DC .1875—1.0000							○	◎	I057	I072
			—	DS2SRB-NA○	Corner radius, Short, 2 flute, Neck relief	INCH DC .1875—1.0000							○	◎	I058	I072
		3	—	C3SARB	Corner radius, Short cut length, 3 flute, For aluminum alloy	METRIC DC 12—25							○	◎	I357	I358
	For Graphite	2 4	DF	DFPSRB	Corner radius, Short cut length, 2-4 flute, High precision, For graphite	METRIC DC 0.5—12	Graphite : ◎ GFPR,CFPR : ○							○	I344	I346
LONG NECK RADIUS	General	2	MS	MS2XLRB	Corner radius, Short cut length, 2 flute, Long neck	METRIC DC 1—6	◎	◎	○		○	○			I135	I136
TAPER	Rib Processing	4	MS	MS4LT	Taper, Long cut length, 4 flute	METRIC DC 0.2—3	◎	◎	○		○				I148	I154
TAPER BALL	Rib Processing	4	MS	MS4LTB	Ball nose, 4 flute, Taper, For rib milling	METRIC PRFRAD 0.3—1	◎	◎	○		○	○			I157	I160
TAPER	Slope Machining	2	MS	MS2MT	Taper, Medium cut length, 2 flute	METRIC DC 0.2—10	◎	◎	○		○	○			I143	I147
TAPER BALL	Slope Machining	2	MS	MS2MTB	Ball nose taper, Medium cut length, 2 flute	METRIC PRFRAD 0.2—1.5	◎	◎	○		○	○			I155	I156
	Slope Machining	4	VC	VC4STB	Ball nose taper, Short cut length, 4 flute	METRIC PRFRAD 0.3—4	○	◎	◎	◎	○	○			I197	I199
ROUGHING	Roughing	4	MS	DS4MC-CB	Chipbreaker, Medium, 4 flute	INCH DC .1250—1.0000	◎	◎	○		○	○			I051	I072
	Roughing	4	MS	DS4LC-CB	Chipbreaker, Long, 4 flute	INCH DC .1250—1.0000	◎	◎	○		○	○			I052	I072
	Roughing	3 4	VC	VCSFPR	Roughing, Short cut length, 3—4 flute	METRIC DC 3—20	◎	◎	○		◎	◎			I167	I168
	For Difficult-to-cut Material	3 4	VF	VFSFPR	Roughing, Short cut length, 3—4 flute	METRIC DC 3—20	◎	◎	○		◎	◎			I271	I272
	For Difficult-to-cut Material	4	VF	VFSFPRCH	Roughing, Short cut length, 4 flute, with multiple internal through coolant holes	METRIC DC 16, 20					◎	◎			I273	I273

◎ : Excellent ○ : Good None : Not Recommended

END MILLS SELECTION CHART CARBIDE

Shape	Type	Number of Flutes	Coating	Order Number	Shape	Cutting Diameter Range	Work Material P: Carbon Steel, Alloy Steel, Cast Iron	P: Tool Steel, Pre-Hardened Steel, Hardened Steel	H: Hardened Steel (—55HRC)	H: Hardened Steel (55HRC—)	M: Austenitic Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	N: Copper Alloy	N: Aluminum Alloy	Page: Dimensions	Page: Cutting Conditions
ROUGHING	For Difficult-to-cut Material	6	VF	VF6SVRCH	Roughing, Short cut length, 6 flute, Irregular helix flutes, with multiple internal through coolant holes	METRIC DC 16, 20					◎	◎			I274	I274
		4	VF	VFMFPR	Roughing, Medium cut length, 4 flute	METRIC DC 5—20	◎	◎	○		◎	◎			I275	I276
	Roughing Aluminum Alloy	3	—	DS3MHR-A	Roughing, Medium, 3 flute, For aluminum alloys	INCH DC .2500—1.0000								◎	I059	I072
			—	CSRA NEW	Roughing end mill, Short cut length, 3 flute, For aluminium alloy	METRIC DC 10—25								◎	I359	I360
ROUGHING RADIUS			—	CSRARB NEW	Corner radius roughing end mill, Short cut length, 3 flute, For aluminium alloy	METRIC DC 10—25								◎	I361	I362
CHAMFERING	Chamfering	2	VC	VC2C	Chamfer cutter, 2 flute	METRIC DC 2—12	◎	◎	◎	○	◎	◎	○	○	I201	I201

◎ : Excellent ○ : Good None : Not Recommended

END MILLS SELECTION CHART CBN

Shape	Type	Number of Flutes	Coating	Order Number	Shape	Cutting Diameter Range	Work Material P: Carbon Steel, Alloy Steel, Cast Iron	P: Tool Steel, Pre-Hardened Steel, Hardened Steel	H: Hardened Steel (—55HRC)	H: Hardened Steel (55HRC—)	M: Austenitic Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	N: Copper Alloy	N: Aluminum Alloy	Page: Dimensions	Page: Cutting Conditions
LONG NECK BALL	High Precision	2	—	CBN2XLB	Ball nose, Short cut length, 2 flute, Long neck	METRIC PRFRAD 0.2—1	○	◎	◎	◎					I347	I348
LONG NECK RADIUS				CBN2XLRB	Corner radius, Short cut length, 2 flute, Long neck	METRIC DC 0.5—2	○	◎	◎	◎					I349	I350

◎ : Excellent ○ : Good None : Not Recommended

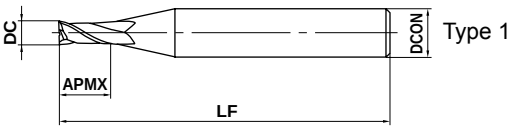
DS2SS

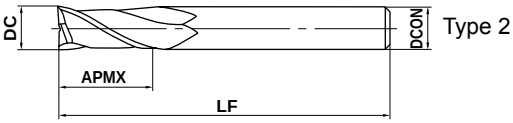
Short, 2 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		







DC<.0156"	.0312"<DC<.2500"	DC>.2500"		
0 - .001"	0 - .002"	0 - .003"		
DCON=.1250"	**DCON=.1875"**	**.2500<DCON<.3750"**	**.4375<DCON<.6250"**	**DCON=.7500"**
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 2 flute square end mill for general purpose.
- Helix angle 30°.

Unit : Inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS2SSD1/64	.0156	.023	1.500	.1250	2	●	1
DS2SS**D1/32**	.0312	.063	1.500	.1250	2	●	1
DS2SS**D3/64**	.0469	.094	1.500	.1250	2	●	1
DS2SS**D1/16**	.0625	.125	1.500	.1250	2	●	1
DS2SS**D5/64**	.0781	.156	1.500	.1250	2	□	1
DS2SS**D3/32**	.0938	.188	1.500	.1250	2	●	1
DS2SS**D7/64**	.1094	.219	1.500	.1250	2	□	1
DS2SS**D1/8**	.1250	.250	1.500	.1250	2	●	2
DS2SS**D9/64**	.1406	.313	2.000	.1875	2	□	1
DS2SS**D5/32**	.1562	.313	2.000	.1875	2	□	1
DS2SS**D11/64**	.1719	.375	2.000	.1875	2	□	1
DS2SS**D3/16**	.1875	.375	2.000	.1875	2	●	2
DS2SS**D13/64**	.2031	.500	2.000	.2500	2	□	1
DS2SS**D7/32**	.2187	.500	2.000	.2500	2	□	1
DS2SS**D15/64**	.2344	.500	2.000	.2500	2	□	1
DS2SS**D1/4**	.2500	.500	2.000	.2500	2	●	2
DS2SS**D9/32**	.2813	.500	2.000	.3125	2	□	1
DS2SS**D5/16**	.3125	.500	2.000	.3125	2	□	2
DS2SS**D3/8**	.3750	.563	2.000	.3750	2	●	2
DS2SS**D7/16**	.4375	.625	2.500	.4375	2	□	2
DS2SS**D1/2**	.5000	.625	2.500	.5000	2	●	2
DS2SS**D5/8**	.6250	.750	3.000	.6250	2	●	2
DS2SS**D3/4**	.7500	1.000	3.000	.7500	2	●	2

● : Inventory maintained. □ : Non stock, produced to order only.

CUTTING CONDITIONS ➤ I072

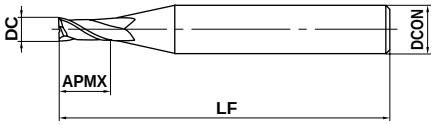
DS2MS

Medium, 2 flute

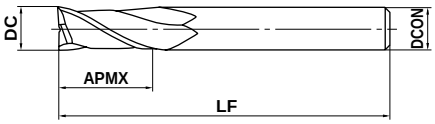
DC=.0156" DC≥.0312"

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

DC≤.0156"	.0312"≤DC≤.2500"	DC>.2500"			
0 - .001"	0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	.7500≤DCON≤1.0000"	DCON=1.2500"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"	0 - .00063"

- 2 flute square end mill for general purpose.
- Helix angle 30°.

Unit : Inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS2MSD1/64	.0156	.040	1.500	.1250	2	●	1
DS2MS**D1/32**	.0312	.078	1.500	.1250	2	●	1
DS2MS**D3/64**	.0469	.109	1.500	.1250	2	●	1
DS2MS**D1/16**	.0625	.188	1.500	.1250	2	●	1
DS2MS**D5/64**	.0781	.234	1.500	.1250	2	□	1
DS2MS**D3/32**	.0938	.281	1.500	.1250	2	●	1
DS2MS**D7/64**	.1094	.328	1.500	.1250	2	□	1
DS2MS**D1/8**	.1250	.375	1.500	.1250	2	●	2
DS2MS**D9/64**	.1406	.500	2.000	.1875	2	□	1
DS2MS**D5/32**	.1562	.500	2.000	.1875	2	□	1
DS2MS**D11/64**	.1719	.563	2.000	.1875	2	□	1
DS2MS**D3/16**	.1875	.563	2.000	.1875	2	●	2
DS2MS**D13/64**	.2031	.625	2.500	.2500	2	□	1
DS2MS**D7/32**	.2187	.625	2.500	.2500	2	□	1
DS2MS**D15/64**	.2344	.750	2.500	.2500	2	□	1
DS2MS**D1/4**	.2500	.750	2.500	.2500	2	●	2
DS2MS**D9/32**	.2813	.750	2.500	.3125	2	□	1
DS2MS**D5/16**	.3125	.813	2.500	.3125	2	□	2
DS2MS**D3/8**	.3750	.875	2.500	.3750	2	●	2
DS2MS**D7/16**	.4375	1.000	2.750	.4375	2	□	2
DS2MS**D1/2**	.5000	1.000	3.000	.5000	2	●	2
DS2MS**D9/16**	.5625	1.125	3.500	.5625	2	●	2
DS2MS**D5/8**	.6250	1.250	3.500	.6250	2	●	2
DS2MS**D3/4**	.7500	1.500	4.000	.7500	2	●	2
DS2MS**D7/8**	.8750	1.500	4.000	.8750	2	●	2
DS2MS**D1**	1.0000	1.500	4.000	1.0000	2	□	2
DS2MS**D1-1/4**	1.2500	1.563	4.375	1.2500	2	□	2

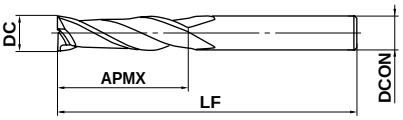
DS2LS

Long, 2 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	.7500≤DCON≤1.0000"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 2 flute square end mill for general purpose.
- Helix angle 30°.

Unit : Inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS2LSD1/8	.1250	1.000	2.500	.1250	2	●	1
DS2LS**D3/16**	.1875	1.125	3.000	.1875	2	●	1
DS2LS**D1/4**	.2500	1.250	3.000	.2500	2	●	1
DS2LS**D5/16**	.3125	1.375	3.250	.3125	2	□	1
DS2LS**D3/8**	.3750	1.500	3.500	.3750	2	●	1
DS2LS**D7/16**	.4375	1.750	4.000	.4375	2	□	1
DS2LS**D1/2**	.5000	2.000	4.000	.5000	2	●	1
DS2LS**D5/8**	.6250	2.500	4.625	.6250	2	●	1
DS2LS**D3/4**	.7500	3.000	5.250	.7500	2	●	1
DS2LS**D1**	1.0000	3.000	6.000	1.0000	2	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

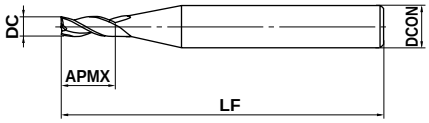
CUTTING CONDITIONS ➤ I072

DS3SC

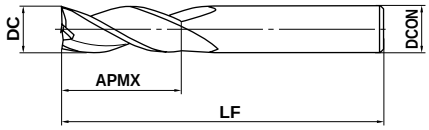
Short, 3 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1



Type 2

DC≤.0156"	.0312"≤DC≤.2500"	DC>.2500"		
0 - .001"	0 - .002"	0 - .003"		
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	DCON=.7500"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 3 flute square end mill for general purpose.
- Helix angle 30°.

Unit : Inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS3SCD1/64	.0156	.023	1.500	.1250	3	●	1
DS3SC**D1/32**	.0312	.063	1.500	.1250	3	●	1
DS3SC**D3/64**	.0469	.094	1.500	.1250	3	●	1
DS3SC**D1/16**	.0625	.125	1.500	.1250	3	●	1
DS3SC**D5/64**	.0781	.156	1.500	.1250	3	□	1
DS3SC**D3/32**	.0938	.188	1.500	.1250	3	●	1
DS3SC**D7/64**	.1094	.219	1.500	.1250	3	□	1
DS3SC**D1/8**	.1250	.250	1.500	.1250	3	●	2
DS3SC**D9/64**	.1406	.313	2.000	.1875	3	□	1
DS3SC**D5/32**	.1562	.313	2.000	.1875	3	□	1
DS3SC**D11/64**	.1719	.375	2.000	.1875	3	□	1
DS3SC**D3/16**	.1875	.375	2.000	.1875	3	●	2
DS3SC**D13/64**	.2031	.500	2.000	.2500	3	□	1
DS3SC**D7/32**	.2187	.500	2.000	.2500	3	□	1
DS3SC**D15/64**	.2344	.500	2.000	.2500	3	□	1
DS3SC**D1/4**	.2500	.500	2.000	.2500	3	●	2
DS3SC**D9/32**	.2813	.500	2.000	.3125	3	□	1
DS3SC**D5/16**	.3125	.500	2.000	.3125	3	□	2
DS3SC**D3/8**	.3750	.563	2.000	.3750	3	●	2
DS3SC**D7/16**	.4375	.625	2.500	.4375	3	□	2
DS3SC**D1/2**	.5000	.625	2.500	.5000	3	●	2
DS3SC**D5/8**	.6250	.750	3.000	.6250	3	●	2
DS3SC**D3/4**	.7500	1.000	3.000	.7500	3	□	2

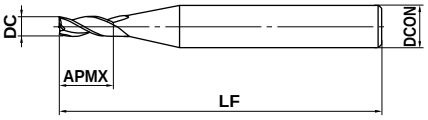
DS3MC

Medium, 3 flute

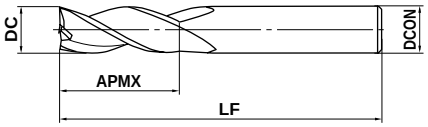


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1



Type 2

DC≤.0156"	.0312"≤DC≤.2500"	DC>.2500"			
0 - .001"	0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	.7500≤DCON≤1.0000"	DCON=1.2500"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"	0 - .00063"

- 3 flute square end mill for general purpose.
- Helix angle 30°.

Unit : Inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS3MCD1/64	.0156	.040	1.500	.1250	3	●	1
DS3MC**D1/32**	.0312	.078	1.500	.1250	3	●	1
DS3MC**D3/64**	.0469	.109	1.500	.1250	3	□	1
DS3MC**D1/16**	.0625	.188	1.500	.1250	3	●	1
DS3MC**D5/64**	.0781	.234	1.500	.1250	3	●	1
DS3MC**D3/32**	.0938	.281	1.500	.1250	3	●	1
DS3MC**D7/64**	.1094	.328	1.500	.1250	3	●	1
DS3MC**D1/8**	.1250	.375	1.500	.1250	3	●	2
DS3MC**D9/64**	.1406	.500	2.000	.1875	3	□	1
DS3MC**D5/32**	.1562	.500	2.000	.1875	3	□	1
DS3MC**D11/64**	.1719	.563	2.000	.1875	3	□	1
DS3MC**D3/16**	.1875	.563	2.000	.1875	3	●	2
DS3MC**D13/64**	.2031	.625	2.500	.2500	3	□	1
DS3MC**D7/32**	.2187	.625	2.500	.2500	3	□	1
DS3MC**D15/64**	.2344	.750	2.500	.2500	3	□	1
DS3MC**D1/4**	.2500	.750	2.500	.2500	3	●	2
DS3MC**D9/32**	.2813	.750	2.500	.3125	3	□	1
DS3MC**D5/16**	.3125	.813	2.500	.3125	3	●	2
DS3MC**D3/8**	.3750	.875	2.500	.3750	3	●	2
DS3MC**D7/16**	.4375	1.000	2.750	.4375	3	□	2
DS3MC**D1/2**	.5000	1.000	3.000	.5000	3	●	2
DS3MC**D9/16**	.5625	1.125	3.500	.5625	3	●	2
DS3MC**D5/8**	.6250	1.250	3.500	.6250	3	●	2
DS3MC**D3/4**	.7500	1.500	4.000	.7500	3	●	2
DS3MC**D7/8**	.8750	1.500	4.000	.8750	3	□	2
DS3MC**D1**	1.0000	1.500	4.000	1.0000	3	□	2
DS3MC**D1-1/4**	1.2500	1.563	4.375	1.2500	3	□	2

● : Inventory maintained. □ : Non stock, produced to order only.

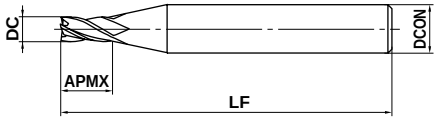
CUTTING CONDITIONS ➤ I072

DS4SC

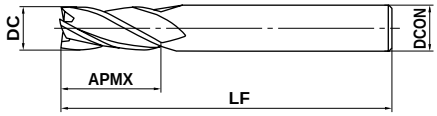
Short, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1



Type 2

DC≤.0156"	.0312"≤DC≤.2500"	DC>.2500"		
0 - .001"	0 - .002"	0 - .003"		
DCON=.1250"	**DCON=.1875"**	**.2500≤DCON≤.3750"**	**.4375≤DCON≤.6250"**	**DCON=.7500"**
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 4 flute square end mill for general purpose.
- Helix angle 30°.

Unit : Inch

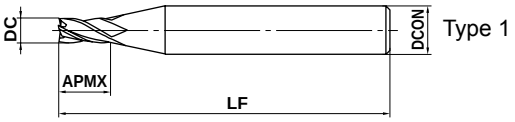
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS4SCD1/64	.0156	.023	1.500	.1250	4	●	1
DS4SC**D1/32**	.0312	.063	1.500	.1250	4	●	1
DS4SC**D3/64**	.0469	.094	1.500	.1250	4	●	1
DS4SC**D1/16**	.0625	.125	1.500	.1250	4	●	1
DS4SC**D5/64**	.0781	.156	1.500	.1250	4	□	1
DS4SC**D3/32**	.0938	.188	1.500	.1250	4	●	1
DS4SC**D7/64**	.1094	.219	1.500	.1250	4	□	1
DS4SC**D1/8**	.1250	.250	1.500	.1250	4	●	2
DS4SC**D9/64**	.1406	.313	2.000	.1875	4	□	1
DS4SC**D5/32**	.1562	.313	2.000	.1875	4	□	1
DS4SC**D11/64**	.1719	.375	2.000	.1875	4	□	1
DS4SC**D3/16**	.1875	.375	2.000	.1875	4	●	2
DS4SC**D13/64**	.2031	.500	2.000	.2500	4	□	1
DS4SC**D7/32**	.2187	.500	2.000	.2500	4	□	1
DS4SC**D15/64**	.2344	.500	2.000	.2500	4	□	1
DS4SC**D1/4**	.2500	.500	2.000	.2500	4	●	2
DS4SC**D9/32**	.2813	.500	2.000	.3125	4	□	1
DS4SC**D5/16**	.3125	.500	2.000	.3125	4	□	2
DS4SC**D3/8**	.3750	.563	2.000	.3750	4	●	2
DS4SC**D7/16**	.4375	.625	2.500	.4375	4	□	2
DS4SC**D1/2**	.5000	.625	2.500	.5000	4	●	2
DS4SC**D5/8**	.6250	.750	3.000	.6250	4	●	2
DS4SC**D3/4**	.7500	1.000	3.000	.7500	4	●	2

DS4MC

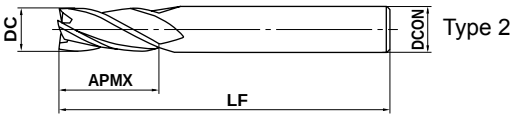
Medium, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1



Type 2

DC≤.0156"	.0312"≤DC≤.2500"	DC>.2500"			
0 - .001"	0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	.7500≤DCON≤1.0000"	DCON=1.2500"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"	0 - .00063"

- 4 flute square end mill for general purpose.
- Helix angle 30°.

Unit : Inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS4MCD1/64	.0156	.040	1.500	.1250	4	●	1
DS4MC**D1/32**	.0312	.078	1.500	.1250	4	●	1
DS4MC**D3/64**	.0469	.109	1.500	.1250	4	●	1
DS4MC**D1/16**	.0625	.188	1.500	.1250	4	●	1
DS4MC**D5/64**	.0781	.234	1.500	.1250	4	□	1
DS4MC**D3/32**	.0938	.281	1.500	.1250	4	●	1
DS4MC**D7/64**	.1094	.328	1.500	.1250	4	□	1
DS4MC**D1/8**	.1250	.375	1.500	.1250	4	□	2
DS4MC**D9/64**	.1406	.500	2.000	.1875	4	□	1
DS4MC**D5/32**	.1562	.500	2.000	.1875	4	●	1
DS4MC**D11/64**	.1719	.563	2.000	.1875	4	□	1
DS4MC**D3/16**	.1875	.563	2.000	.1875	4	●	2
DS4MC**D13/64**	.2031	.625	2.500	.2500	4	□	1
DS4MC**D7/32**	.2187	.625	2.500	.2500	4	□	1
DS4MC**D15/64**	.2344	.750	2.500	.2500	4	□	1
DS4MC**D1/4**	.2500	.750	2.500	.2500	4	●	2
DS4MC**D9/32**	.2813	.750	2.500	.3125	4	□	1
DS4MC**D5/16**	.3125	.813	2.500	.3125	4	●	2
DS4MC**D3/8**	.3750	.875	2.500	.3750	4	●	2
DS4MC**D7/16**	.4375	1.000	2.750	.4375	4	●	2
DS4MC**D1/2**	.5000	1.000	3.000	.5000	4	●	2
DS4MC**D9/16**	.5625	1.125	3.500	.5625	4	●	2
DS4MC**D5/8**	.6250	1.250	3.500	.6250	4	●	2
DS4MC**D3/4**	.7500	1.500	4.000	.7500	4	●	2
DS4MC**D7/8**	.8750	1.500	4.000	.8750	4	●	2
DS4MC**D1**	1.0000	1.500	4.000	1.0000	4	□	2
DS4MC**D1-1/4**	1.2500	1.563	4.375	1.2500	4	□	2

● : Inventory maintained. □ : Non stock, produced to order only.

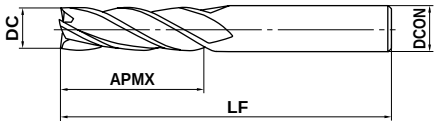
CUTTING CONDITIONS ➤ I072

DS4LC

Long, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	.7500≤DCON≤1.0000"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 4 flute square end mill for general purpose.
- Helix angle 30°.

Unit : Inch

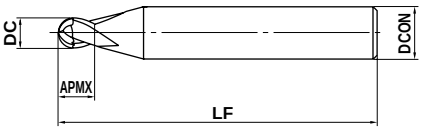
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS4LCD1/8	.1250	1.000	2.500	.1250	4	●	1
DS4LC**D3/16**	.1875	1.125	3.000	.1875	4	●	1
DS4LC**D1/4**	.2500	1.250	3.000	.2500	4	●	1
DS4LC**D5/16**	.3125	1.375	3.250	.3125	4	□	1
DS4LC**D3/8**	.3750	1.500	3.500	.3750	4	●	1
DS4LC**D7/16**	.4375	1.750	4.000	.4375	4	□	1
DS4LC**D1/2**	.5000	2.000	4.000	.5000	4	●	1
DS4LC**D5/8**	.6250	2.500	4.625	.6250	4	●	1
DS4LC**D3/4**	.7500	3.000	5.250	.7500	4	●	1
DS4LC**D1**	1.0000	3.000	6.000	1.0000	4	□	1

DS2SB

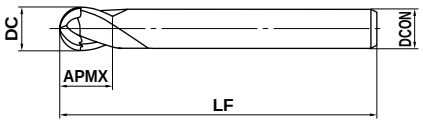
Ball nose, Short, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1



Type 2

DC≤.0156"	.0312"≤DC≤.2500"	DC>.2500"		
0 - .001"	0 - .002"	0 - .003"		
DCON=.1250"	**DCON=.1875"**	**.2500≤DCON≤.3750"**	**.4375≤DCON≤.6250"**	**DCON=.7500"**
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 2 flute ball nose end mill for general purpose.
- Helix angle 30°.

Unit : Inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS2SBD1/64	.0156	.023	1.500	.1250	2	●	1
DS2SB**D1/32**	.0312	.063	1.500	.1250	2	●	1
DS2SB**D3/64**	.0469	.094	1.500	.1250	2	●	1
DS2SB**D1/16**	.0625	.125	1.500	.1250	2	●	1
DS2SB**D3/32**	.0938	.188	1.500	.1250	2	●	1
DS2SB**D1/8**	.1250	.250	1.500	.1250	2	●	2
DS2SB**D9/64**	.1406	.313	2.000	.1875	2	□	1
DS2SB**D5/32**	.1562	.313	2.000	.1875	2	□	1
DS2SB**D11/64**	.1719	.375	2.000	.1875	2	□	1
DS2SB**D3/16**	.1875	.375	2.000	.1875	2	●	2
DS2SB**D13/64**	.2031	.500	2.000	.2500	2	□	1
DS2SB**D7/32**	.2187	.500	2.000	.2500	2	□	1
DS2SB**D15/64**	.2344	.500	2.000	.2500	2	□	1
DS2SB**D1/4**	.2500	.500	2.000	.2500	2	●	2
DS2SB**D5/16**	.3125	.500	2.000	.3125	2	□	2
DS2SB**D3/8**	.3750	.563	2.000	.3750	2	●	2
DS2SB**D7/16**	.4375	.625	2.500	.4375	2	□	2
DS2SB**D1/2**	.5000	.625	2.500	.5000	2	●	2
DS2SB**D5/8**	.6250	.750	3.000	.6250	2	●	2
DS2SB**D3/4**	.7500	1.000	3.000	.7500	2	●	2

● : Inventory maintained. □ : Non stock, produced to order only.

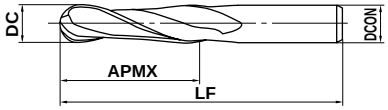
CUTTING CONDITIONS ➤ I073

DS2LB

Ball nose, Long, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	.7500≤DCON≤1.0000"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 2 flute ball nose end mill for general purpose.
- Helix angle 30°.

Unit : Inch

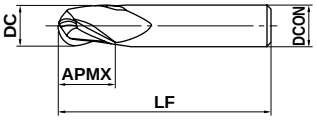
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS2LBD1/8	.1250	1.000	2.500	.1250	2	●	1
DS2LB**D3/16**	.1875	1.125	3.000	.1875	2	●	1
DS2LB**D1/4**	.2500	1.250	3.000	.2500	2	●	1
DS2LB**D5/16**	.3125	1.375	3.250	.3125	2	□	1
DS2LB**D3/8**	.3750	1.500	3.500	.3750	2	●	1
DS2LB**D7/16**	.4375	1.750	4.000	.4375	2	□	1
DS2LB**D1/2**	.5000	2.000	4.000	.5000	2	●	1
DS2LB**D5/8**	.6250	2.500	4.625	.6250	2	●	1
DS2LB**D3/4**	.7500	3.000	5.250	.7500	2	●	1
DS2LB**D1**	1.0000	3.000	6.000	1.0000	2	□	1

DS3SB

Ball nose, Short, 3 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	DCON=.7500"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 3 flute ball nose end mill for general purpose.
- Helix angle 30°.

Unit : Inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS3SBD1/8	.1250	.250	1.500	.1250	3	●	1
DS3SB**D3/16**	.1875	.375	2.000	.1875	3	●	1
DS3SB**D1/4**	.2500	.500	2.000	.2500	3	●	1
DS3SB**D5/16**	.3125	.500	2.000	.3125	3	□	1
DS3SB**D3/8**	.3750	.563	2.000	.3750	3	●	1
DS3SB**D7/16**	.4375	.625	2.500	.4375	3	□	1
DS3SB**D1/2**	.5000	.625	2.500	.5000	3	●	1
DS3SB**D5/8**	.6250	.750	3.000	.6250	3	●	1
DS3SB**D3/4**	.7500	1.000	3.000	.7500	3	●	1

● : Inventory maintained. □ : Non stock, produced to order only.

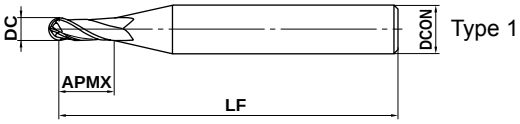
CUTTING CONDITIONS ➤ I073

DS4SB

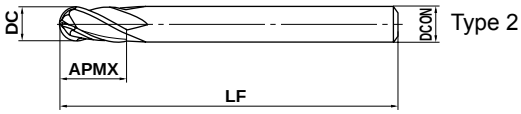
Ball nose, Short, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1



Type 2

.0312"≤DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	DCON=.7500"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 4 flute ball nose end mill for general purpose.
- Helix angle 30°.

Unit : Inch

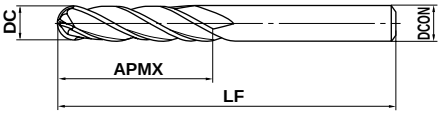
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS4SBD1/32	.0312	.063	1.500	.1250	4	●	1
DS4SB**D3/64**	.0469	.094	1.500	.1250	4	●	1
DS4SB**D1/16**	.0625	.125	1.500	.1250	4	●	1
DS4SB**D3/32**	.0938	.188	1.500	.1250	4	●	1
DS4SB**D1/8**	.1250	.250	1.500	.1250	4	●	2
DS4SB**D9/64**	.1406	.313	2.000	.1875	4	□	1
DS4SB**D5/32**	.1562	.313	2.000	.1875	4	□	1
DS4SB**D11/64**	.1719	.375	2.000	.1875	4	□	1
DS4SB**D3/16**	.1875	.375	2.000	.1875	4	●	2
DS4SB**D13/64**	.2031	.500	2.000	.2500	4	□	1
DS4SB**D7/32**	.2187	.500	2.000	.2500	4	□	1
DS4SB**D15/64**	.2344	.500	2.000	.2500	4	□	1
DS4SB**D1/4**	.2500	.500	2.000	.2500	4	●	2
DS4SB**D5/16**	.3125	.500	2.000	.3125	4	□	2
DS4SB**D3/8**	.3750	.563	2.000	.3750	4	●	2
DS4SB**D7/16**	.4375	.625	2.500	.4375	4	□	2
DS4SB**D1/2**	.5000	.625	2.500	.5000	4	●	2
DS4SB**D5/8**	.6250	.750	3.000	.6250	4	●	2
DS4SB**D3/4**	.7500	1.000	3.000	.7500	4	●	2

DS4LB

Ball nose, Long, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	.7500≤DCON≤1.0000"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 4 flute ball nose end mill for general purpose.
- Helix angle 30°.

Unit : Inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS4LBD1/8	.1250	1.000	2.500	.1250	4	●	1
DS4LB**D3/16**	.1875	1.125	3.000	.1875	4	●	1
DS4LB**D1/4**	.2500	1.250	3.000	.2500	4	●	1
DS4LB**D5/16**	.3125	1.375	3.250	.8333	4	□	1
DS4LB**D3/8**	.3750	1.500	3.500	.3750	4	●	1
DS4LB**D7/16**	.4375	1.750	4.000	.4375	4	□	1
DS4LB**D1/2**	.5000	2.000	4.000	.5000	4	●	1
DS4LB**D5/8**	.6250	2.500	4.625	.6250	4	●	1
DS4LB**D3/4**	.7500	3.000	5.250	.7500	4	●	1
DS4LB**D1**	1.0000	3.000	6.000	1.0000	4	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

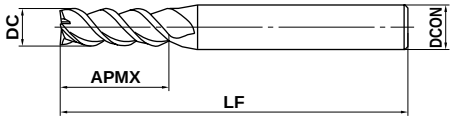
CUTTING CONDITIONS ➤ I073

DS3MHH60

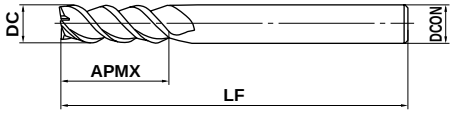
High helix, Medium, 3 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		





Type 1



Type 2

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	.7500≤DCON≤1.0000"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 3 flute high helix square end mill for difficult to cut materials.
- Helix angle 60°.

Unit : Inch

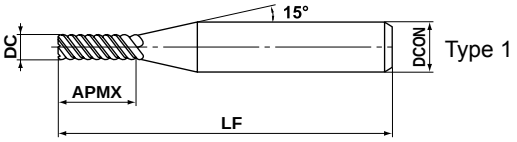
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS3MHH60D1/8	.1250	.375	1.500	.1250	3	●	2
DS3MHH60**D5/32**	.1562	.500	2.000	.1875	3	□	1
DS3MHH60**D3/16**	.1875	.563	2.000	.1875	3	●	2
DS3MHH60**D7/32**	.2187	.625	2.500	.2500	3	□	1
DS3MHH60**D1/4**	.2500	.750	2.500	.2500	3	●	2
DS3MHH60**D9/32**	.2813	.750	2.500	.3125	3	□	1
DS3MHH60**D5/16**	.3125	.813	2.500	.3125	3	□	2
DS3MHH60**D3/8**	.3750	.875	2.500	.3750	3	●	2
DS3MHH60**D7/16**	.4375	1.000	2.750	.4375	3	□	2
DS3MHH60**D1/2**	.5000	1.000	3.000	.5000	3	●	2
DS3MHH60**D9/16**	.5625	1.125	3.500	.5625	3	□	2
DS3MHH60**D5/8**	.6250	1.250	3.500	.6250	3	●	2
DS3MHH60**D3/4**	.7500	1.500	4.000	.7500	3	●	2
DS3MHH60**D7/8**	.8750	1.500	4.000	.8750	3	□	2
DS3MHH60**D1**	1.0000	1.500	4.000	1.0000	3	□	2

DS6MHH60

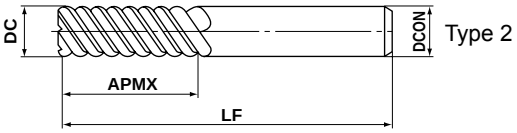
High helix, Medium, 6 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		





Type 1



Type 2

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	.7500≤DCON≤1.0000"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 6 flute high helix square end mill for difficult to cut materials.
- Helix angle 60°.

Unit : Inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS6MHH60D1/8	.1250	.375	1.500	.1250	6	●	2
DS6MHH60**D5/32**	.1562	.500	2.000	.1875	6	□	1
DS6MHH60**D3/16**	.1875	.563	2.000	.1875	6	●	2
DS6MHH60**D7/32**	.2187	.625	2.500	.2500	6	●	1
DS6MHH60**D1/4**	.2500	.750	2.500	.2500	6	●	2
DS6MHH60**D9/32**	.2813	.750	2.500	.3125	6	□	1
DS6MHH60**D5/16**	.3125	.813	2.500	.3125	6	□	2
DS6MHH60**D3/8**	.3750	.875	2.500	.3750	6	●	1
DS6MHH60**D7/16**	.4375	1.000	2.750	.4375	6	□	2
DS6MHH60**D1/2**	.5000	1.000	3.000	.5000	6	●	1
DS6MHH60**D9/16**	.5625	1.125	3.500	.5625	6	□	2
DS6MHH60**D5/8**	.6250	1.250	3.500	.6250	6	●	1
DS6MHH60**D3/4**	.7500	1.500	4.000	.7500	6	□	2
DS6MHH60**D7/8**	.8750	1.500	4.000	.8750	6	□	1
DS6MHH60**D1**	1.0000	1.500	4.000	1.0000	6	□	2

● : Inventory maintained. □ : Non stock, produced to order only.

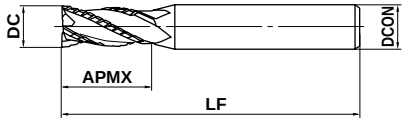
CUTTING CONDITIONS ➤ I072

DS4MC...CB

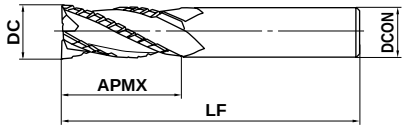
Chipbreaker, Medium, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1



Type 2

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	.7500≤DCON≤1.0000"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 4 flute chipbreaker end mill.
- Helix angle 30°.

Unit : Inch

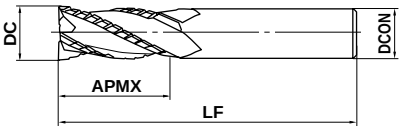
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS4MCD1/8CB	.1250	.375	1.500	.1250	4	□	2
DS4MC**D5/32CB**	.1562	.500	2.000	.1875	4	□	1
DS4MC**D3/16CB**	.1875	.563	2.000	.1875	4	□	2
DS4MC**D7/32CB**	.2187	.625	2.500	.2500	4	□	1
DS4MC**D1/4CB**	.2500	.750	2.500	.2500	4	●	2
DS4MC**D9/32CB**	.2813	.750	2.500	.3125	4	□	1
DS4MC**D5/16CB**	.3125	.813	2.500	.3125	4	□	2
DS4MC**D3/8CB**	.3750	.875	2.500	.3750	4	●	2
DS4MC**D7/16CB**	.4375	1.000	2.750	.4375	4	□	2
DS4MC**D1/2CB**	.5000	1.000	3.000	.5000	4	●	2
DS4MC**D9/16CB**	.5625	1.125	3.500	.5625	4	□	2
DS4MC**D5/8CB**	.6250	1.250	3.500	.6250	4	●	2
DS4MC**D3/4CB**	.7500	1.500	4.000	.7500	4	□	2
DS4MC**D7/8CB**	.8750	1.500	4.000	.8750	4	□	2
DS4MC**D1CB**	1.0000	1.500	4.000	1.0000	4	□	2

DS4LC...CB

Chipbreaker, Long, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	.7500≤DCON≤1.0000"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 4 flute chipbreaker end mill.
- Helix angle 30°.

Unit : Inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS4LCD1/8CB	.1250	1.000	2.500	.1250	4	□	1
DS4LC**D3/16CB**	.1875	1.125	3.000	.1875	4	□	1
DS4LC**D1/4CB**	.2500	1.250	3.000	.2500	4	●	1
DS4LC**D5/16CB**	.3125	1.375	3.250	.3125	4	□	1
DS4LC**D3/8CB**	.3750	1.500	3.500	.3750	4	●	1
DS4LC**D7/16CB**	.4375	1.750	4.000	.4375	4	□	1
DS4LC**D1/2CB**	.5000	2.000	4.000	.5000	4	●	1
DS4LC**D5/8CB**	.6250	2.500	4.625	.6250	4	●	1
DS4LC**D3/4CB**	.7500	3.000	5.250	.7500	4	□	1
DS4LC**D1CB**	1.0000	3.000	6.000	1.0000	4	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

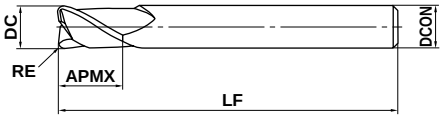
CUTTING CONDITIONS ➤ I072

DS2SRB

Corner radius, Short, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.5000≤DCON≤.6250"	DCON=.7500"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 2 flute radius end mill.
- General purpose.

Unit : Inch

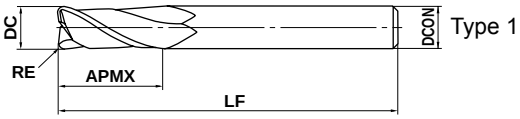
Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
DS2SRBD1/8R0.008	.1250	.008	.250	1.500	.1250	2	●	1
DS2SRB**D3/16R0.015**	.1875	.015	.375	2.000	.1875	2	●	1
DS2SRB**D1/4R0.008**	.2500	.008	.500	2.000	.2500	2	●	1
DS2SRB**D1/4R0.020**	.2500	.020	.500	2.000	.2500	2	●	1
DS2SRB**D3/8R0.020**	.3750	.020	.563	2.000	.3750	2	●	1
DS2SRB**D3/8R0.040**	.3750	.040	.563	2.000	.3750	2	●	1
DS2SRB**D1/2R0.015**	.5000	.015	.625	2.500	.5000	2	●	1
DS2SRB**D1/2R0.030**	.5000	.030	.625	2.500	.5000	2	●	1
DS2SRB**D1/2R0.060**	.5000	.060	.625	2.500	.5000	2	●	1
DS2SRB**D5/8R0.020**	.6250	.020	.750	3.000	.6250	2	●	1
DS2SRB**D5/8R0.040**	.6250	.040	.750	3.000	.6250	2	●	1
DS2SRB**D3/4R0.030**	.7500	.030	1.000	3.000	.7500	2	□	1
DS2SRB**D3/4R0.060**	.7500	.060	1.000	3.000	.7500	2	□	1

DS2MRB

Corner radius, Medium, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.5000≤DCON≤.6250"	DCON=.7500"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 2 flute radius end mill.
- General purpose.

Unit : Inch

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
DS2MRBD1/8R0.008	.1250	.008	.375	1.500	.1250	2	●	1
DS2MRB**D3/16R0.015**	.1875	.015	.563	2.000	.1875	2	●	1
DS2MRB**D1/4R0.008**	.2500	.008	.750	2.500	.2500	2	●	1
DS2MRB**D1/4R0.020**	.2500	.020	.750	2.500	.2500	2	●	1
DS2MRB**D3/8R0.020**	.3750	.020	.875	2.500	.3750	2	●	1
DS2MRB**D3/8R0.040**	.3750	.040	.875	2.500	.3750	2	●	1
DS2MRB**D1/2R0.015**	.5000	.015	1.000	3.000	.5000	2	●	1
DS2MRB**D1/2R0.030**	.5000	.030	1.000	3.000	.5000	2	●	1
DS2MRB**D1/2R0.060**	.5000	.060	1.000	3.000	.5000	2	●	1
DS2MRB**D5/8R0.020**	.6250	.020	1.250	3.500	.6250	2	●	1
DS2MRB**D5/8R0.040**	.6250	.040	1.250	3.500	.6250	2	●	1
DS2MRB**D3/4R0.030**	.7500	.030	1.500	4.000	.7500	2	□	1
DS2MRB**D3/4R0.060**	.7500	.060	1.500	4.000	.7500	2	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

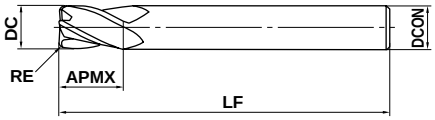
CUTTING CONDITIONS ➤ I072

DS4SRB

Corner radius, Short, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.5000≤DCON≤.6250"	DCON=.7500"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 4 flute radius end mill.
- General purpose.

Unit : Inch

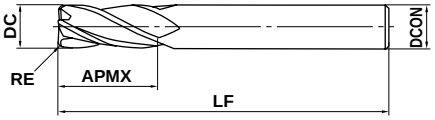
Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
DS4SRBD1/8R0.008	.1250	.008	.250	1.500	.1250	4	●	1
DS4SRB**D3/16R0.015**	.1875	.015	.375	2.000	.1875	4	●	1
DS4SRB**D1/4R0.008**	.2500	.008	.500	2.000	.2500	4	●	1
DS4SRB**D1/4R0.020**	.2500	.020	.500	2.000	.2500	4	●	1
DS4SRB**D3/8R0.020**	.3750	.020	.563	2.000	.3750	4	●	1
DS4SRB**D3/8R0.040**	.3750	.040	.563	2.000	.3750	4	●	1
DS4SRB**D1/2R0.015**	.5000	.015	.625	2.500	.5000	4	●	1
DS4SRB**D1/2R0.030**	.5000	.030	.625	2.500	.5000	4	●	1
DS4SRB**D1/2R0.060**	.5000	.060	.625	2.500	.5000	4	●	1
DS4SRB**D5/8R0.020**	.6250	.020	.750	3.000	.6250	4	●	1
DS4SRB**D5/8R0.040**	.6250	.040	.750	3.000	.6250	4	●	1
DS4SRB**D3/4R0.030**	.7500	.030	1.000	3.000	.7500	4	□	1
DS4SRB**D3/4R0.060**	.7500	.060	1.000	3.000	.7500	4	□	1

DS4MRB

Corner radius, Medium, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			○	○		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.5000≤DCON≤.6250"	DCON=.7500"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 4 flute radius end mill.
- General purpose.

Unit : Inch

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
DS4MRBD1/8R0.008	.1250	.008	.375	1.500	.1250	4	●	1
DS4MRB**D3/16R0.015**	.1875	.015	.563	2.000	.1875	4	●	1
DS4MRB**D1/4R0.008**	.2500	.008	.750	2.500	.2500	4	●	1
DS4MRB**D1/4R0.020**	.2500	.020	.750	2.500	.2500	4	●	1
DS4MRB**D3/8R0.020**	.3750	.020	.875	2.500	.3750	4	●	1
DS4MRB**D3/8R0.040**	.3750	.040	.875	2.500	.3750	4	●	1
DS4MRB**D1/2R0.015**	.5000	.015	1.000	3.000	.5000	4	●	1
DS4MRB**D1/2R0.030**	.5000	.030	1.000	3.000	.5000	4	●	1
DS4MRB**D1/2R0.060**	.5000	.060	1.000	3.000	.5000	4	●	1
DS4MRB**D5/8R0.020**	.6250	.020	1.250	3.500	.6250	4	●	1
DS4MRB**D5/8R0.040**	.6250	.040	1.250	3.500	.6250	4	●	1
DS4MRB**D3/4R0.030**	.7500	.030	1.500	4.000	.7500	4	□	1
DS4MRB**D3/4R0.060**	.7500	.060	1.500	4.000	.7500	4	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

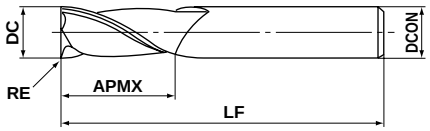
CUTTING CONDITIONS ➤ I072

DS2SRB...A○

Corner radius, Short, 2 flute, For aluminum alloys

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
						○	◎





Type 1

.1875≤DC≤1.0000"				
0 - .003"				
DCON=.1875"	.2500≤DCON≤.3750"	DCON=.5000"	.7500≤DCON≤1.0000"	
0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"	

- 2 flute radius end mill for aluminum alloys.
- Helix angle 30°.

Unit : Inch

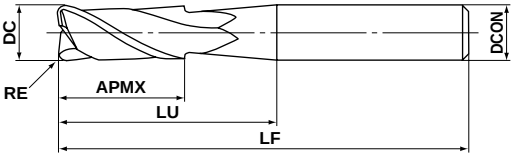
Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
DS2SRBD3/16R0.008A2	.1875	.008	.250	2.000	.1875	2	●	1
DS2SRB**D1/4R0.011A2.5**	.2500	.011	.313	2.500	.2500	2	●	1
DS2SRB**D3/8R0.015A2.5**	.3750	.015	.500	2.500	.3750	2	●	1
DS2SRB**D3/8R0.015A3**	.3750	.015	.500	3.000	.3750	2	●	1
DS2SRB**D3/8R0.015A4**	.3750	.015	.500	4.000	.3750	2	□	1
DS2SRB**D1/2R0.020A3**	.5000	.020	.625	3.000	.5000	2	●	1
DS2SRB**D1/2R0.020A4**	.5000	.020	.625	4.000	.5000	2	●	1
DS2SRB**D1/2R0.020A5**	.5000	.020	.625	5.000	.5000	2	□	1
DS2SRB**D3/4R0.030A4**	.7500	.030	1.000	4.000	.7500	2	●	1
DS2SRB**D3/4R0.030A5**	.7500	.030	1.000	5.000	.7500	2	□	1
DS2SRB**D3/4R0.030A6**	.7500	.030	1.000	6.000	.7500	2	□	1
DS2SRB**D1R0.045A4**	1.0000	.045	1.250	4.000	1.0000	2	□	1
DS2SRB**D1R0.045A5**	1.0000	.045	1.250	5.000	1.0000	2	□	1
DS2SRB**D1R0.045A6**	1.0000	.045	1.250	6.000	1.0000	2	□	1

DS2SRB...NA○

Corner radius, Short, 2 flute, Neck relief

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
						○	◎





Type 1

.1875≤DC≤1.0000"				
0 -.003"				
DCON=.1875"	.2500≤DCON≤.3750"	DCON=.5000"	.7500≤DCON≤1.0000"	
0 -.00031"	0 -.00035"	0 -.00043"	0 -.00051"	

- 2 flute radius end mill with neck relief for aluminum alloys.
- Helix angle 30°.

Unit : Inch

Order Number	DC	RE	APMX	LF	DCON	LU	No. of Flutes	Stock	Type
DS2SRBD3/16R0.008NA2	.1875	.008	.250	2.000	.1875	.563	2	●	1
DS2SRB**D1/4R0.011NA2.5**	.2500	.011	.313	2.500	.2500	.750	2	●	1
DS2SRB**D3/8R0.015NA2.5**	.3750	.015	.500	2.500	.3750	.875	2	●	1
DS2SRB**D3/8R0.015NA3**	.3750	.015	.500	3.000	.3750	1.375	2	●	1
DS2SRB**D3/8R0.015NA4**	.3750	.015	.500	4.000	.3750	2.375	2	□	1
DS2SRB**D1/2R0.020NA3**	.5000	.020	.625	3.000	.5000	1.125	2	●	1
DS2SRB**D1/2R0.020NA4**	.5000	.020	.625	4.000	.5000	2.125	2	●	1
DS2SRB**D1/2R0.020NA5**	.5000	.020	.625	5.000	.5000	3.125	2	●	1
DS2SRB**D3/4R0.030NA4**	.7500	.030	1.000	4.000	.7500	1.875	2	●	1
DS2SRB**D3/4R0.030NA5**	.7500	.030	1.000	5.000	.7500	2.875	2	□	1
DS2SRB**D3/4R0.030NA6**	.7500	.030	1.000	6.000	.7500	3.875	2	□	1
DS2SRB**D1R0.045NA4**	1.0000	.045	1.250	4.000	1.0000	1.625	2	□	1
DS2SRB**D1R0.045NA5**	1.0000	.045	1.250	5.000	1.0000	2.625	2	□	1
DS2SRB**D1R0.045NA6**	1.0000	.045	1.250	6.000	1.0000	3.625	2	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

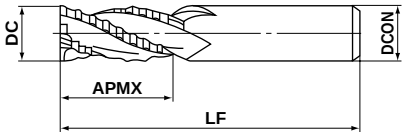
CUTTING CONDITIONS ➤ I072

DS3MHR...A

Roughing, Medium, 3 flute, For aluminum alloys

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎





Type 1

.2500≤DC≤1.0000"				
0 - .005"				
.2500≤DCON≤.3750"	DCON=.5000"	.7500≤DCON≤1.0000"		
0 - .00035"	0 - .00043"	0 - .00051"		

- 3 flute rougher end mill for aluminum alloys.
- Helix angle 45°.

Unit : Inch

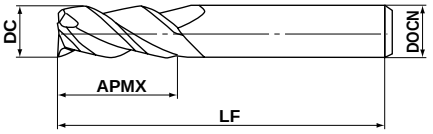
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS3MHRD1/4A	.2500	.750	2.500	.2500	3	●	1
DS3MHR**D3/8A**	.3750	.875	2.500	.3750	3	●	1
DS3MHR**D1/2A**	.5000	1.000	3.000	.5000	3	●	1
DS3MHR**D3/4A**	.7500	1.500	4.000	.7500	3	●	1
DS3MHR**D1A**	1.0000	2.000	4.000	1.0000	3	□	1

DS3SH...SS

Short, 3 flute, For stainless steel

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		





Type 1

DC≤.2500"	DC>.2500"			
0 -.002"	0 -.003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	DCON=.7500"
0 -.00024"	0 -.00031"	0 -.00035"	0 -.00043"	0 -.00051"

- 3 flute square end mill for stainless steel.
- Helix angle 45°.

Unit : Inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS3SHD1/8SS	.1250	.250	1.500	.1250	3	●	1
DS3SH**D3/16SS**	.1875	.313	2.000	.1875	3	●	1
DS3SH**D1/4SS**	.2500	.375	2.000	.2500	3	●	1
DS3SH**D5/16SS**	.3125	.438	2.000	.3125	3	□	1
DS3SH**D3/8SS**	.3750	.500	2.000	.3750	3	●	1
DS3SH**D7/16SS**	.4375	.563	2.500	.4375	3	□	1
DS3SH**D1/2SS**	.5000	.625	2.500	.5000	3	●	1
DS3SH**D5/8SS**	.6250	.750	3.000	.6250	3	●	1
DS3SH**D3/4SS**	.7500	1.000	3.000	.7500	3	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

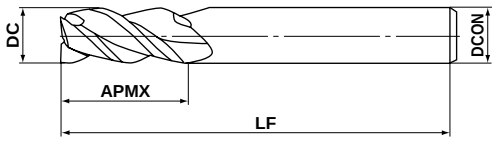
CUTTING CONDITIONS ➤ I072

DS3MH...SS

Medium, 3 flute, For stainless steel

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	DCON=.7500"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 3 flute square end mill for stainless steel.
- Helix angle 45°.

Unit : Inch

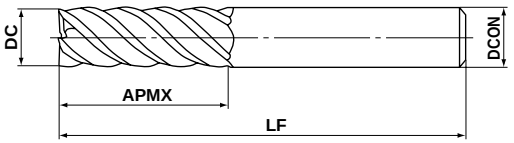
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS3MHD1/8SS	.1250	.375	1.500	.1250	3	●	1
DS3MH**D3/16SS**	.1875	.563	2.000	.1875	3	●	1
DS3MH**D1/4SS**	.2500	.750	2.500	.2500	3	●	1
DS3MH**D5/16SS**	.3125	.813	2.500	.3125	3	□	1
DS3MH**D3/8SS**	.3750	1.000	2.500	.3750	3	●	1
DS3MH**D7/16SS**	.4375	1.000	2.750	.4375	3	□	1
DS3MH**D1/2SS**	.5000	1.250	3.000	.5000	3	●	1
DS3MH**D5/8SS**	.6250	1.625	3.500	.6250	3	●	1
DS3MH**D3/4SS**	.7500	1.625	4.000	.7500	3	□	1

DS5MH...SS

Medium, 5 flute, For stainless steel

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	DCON=.7500"		
0 - .00035"	0 - .00043"	0 - .00051"		

- 5 flute square end mill for stainless steel.
- Helix angle 45°.

Unit : Inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS5MHD1/4SS	.2500	.750	2.500	.2500	5	●	1
DS5MH**D5/16SS**	.3125	.813	2.500	.3125	5	□	1
DS5MH**D3/8SS**	.3750	1.000	2.500	.3750	5	●	1
DS5MH**D7/16SS**	.4375	1.000	2.750	.4375	5	□	1
DS5MH**D1/2SS**	.5000	1.250	3.000	.5000	5	●	1
DS5MH**D5/8SS**	.6250	1.625	3.500	.6250	5	●	1
DS5MH**D3/4SS**	.7500	1.625	4.000	.7500	5	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

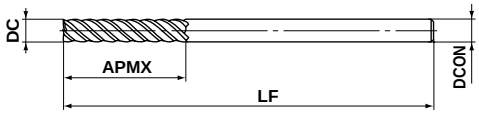
CUTTING CONDITIONS ➤ I072

DS5LH...SS

Long, 5 flute, For stainless steel

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	DCON=.7500"		
0 - .00035"	0 - .00043"	0 - .00051"		

- 5 flute square end mill for stainless steel.
- Helix angle 45°.

Unit : Inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS5LHD1/4SS	.2500	1.250	4.000	.2500	5	●	1
DS5LH**D5/16SS**	.3125	1.250	4.000	.3125	5	●	1
DS5LH**D3/8SS**	.3750	1.500	4.000	.3750	5	●	1
DS5LH**D7/16SS**	.4375	2.000	4.000	.4375	5	□	1
DS5LH**D1/2SS**	.5000	2.000	4.000	.5000	5	●	1
DS5LH**D5/8SS**	.6250	2.500	5.000	.6250	5	●	1
DS5LH**D3/4SS**	.7500	3.250	6.000	.7500	5	□	1

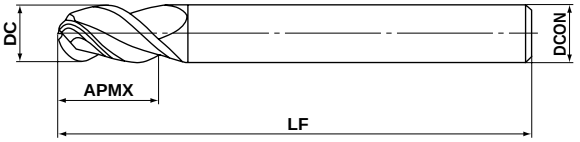
CUTTING CONDITIONS ➤ I072

DS3SHB...SS

Ball nose, Short, 3 flute, For stainless steel

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	DCON=.7500"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 3 flute ball nose end mill for stainless steel.
- Helix angle 45°.

Unit : Inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS3SHBD1/8SS	.1250	.250	1.500	.1250	3	●	1
DS3SHB**D3/16SS**	.1875	.313	2.000	.1875	3	●	1
DS3SHB**D1/4SS**	.2500	.375	2.000	.2500	3	●	1
DS3SHB**D5/16SS**	.3125	.438	2.000	.3125	3	□	1
DS3SHB**D3/8SS**	.3750	.500	2.000	.3750	3	●	1
DS3SHB**D7/16SS**	.4375	.563	2.500	.4375	3	□	1
DS3SHB**D1/2SS**	.5000	.625	2.500	.5000	3	●	1
DS3SHB**D5/8SS**	.6250	.750	3.000	.6250	3	●	1
DS3SHB**D3/4SS**	.7500	1.000	3.000	.7500	3	●	1

● : Inventory maintained. □ : Non stock, produced to order only.

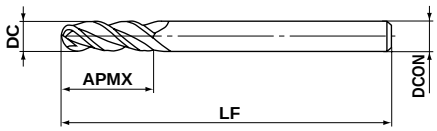
CUTTING CONDITIONS ➤ I073

DS3MHB...SS

Ball nose, Medium, 3 flute, For stainless steel

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	DCON=.7500"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 3 flute ball nose end mill for stainless steel.
- Helix angle 45°.

Unit : Inch

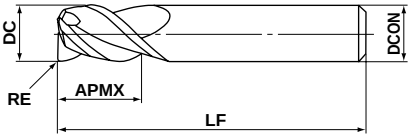
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DS3MHBD1/8SS	.1250	.375	2.500	.1250	3	●	1
DS3MHB**D3/16SS**	.1875	.563	2.000	.1875	3	●	1
DS3MHB**D1/4SS**	.2500	.750	2.500	.2500	3	●	1
DS3MHB**D5/16SS**	.3125	.813	2.500	.3125	3	□	1
DS3MHB**D3/8SS**	.3750	1.000	2.500	.3750	3	●	1
DS3MHB**D7/16SS**	.4375	1.000	2.750	.4375	3	□	1
DS3MHB**D1/2SS**	.5000	1.250	3.000	.5000	3	●	1
DS3MHB**D5/8SS**	.6250	1.625	3.500	.6250	3	●	1
DS3MHB**D3/4SS**	.7500	1.625	4.000	.7500	3	●	1

DS3SHRB...SS

Corner radius, Short, 3 flute, For stainless steel

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	DCON=.7500"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 3 flute radius end mill for stainless steel.
- Helix angle 45°.

Unit : Inch

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
DS3SHRBD1/8R0.008SS	.1250	.008	.250	1.500	.1250	3	●	1
DS3SHRB**D3/16R0.008SS**	.1875	.008	.313	2.000	.1875	3	●	1
DS3SHRB**D1/4R0.015SS**	.2500	.015	.375	2.000	.2500	3	●	1
DS3SHRB**D5/16R0.015SS**	.3125	.015	.438	2.000	.3125	3	□	1
DS3SHRB**D3/8R0.020SS**	.3750	.020	.500	2.000	.3750	3	●	1
DS3SHRB**D7/16R0.020SS**	.4375	.020	.563	2.500	.4375	3	□	1
DS3SHRB**D1/2R0.030SS**	.5000	.030	.625	2.500	.5000	3	●	1
DS3SHRB**D5/8R0.030SS**	.6250	.030	.750	3.000	.6250	3	●	1
DS3SHRB**D3/4R0.035SS**	.7500	.035	1.000	3.000	.7500	3	●	1

● : Inventory maintained. □ : Non stock, produced to order only.

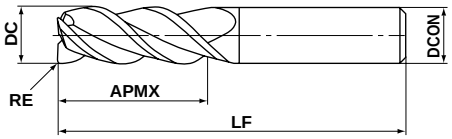
CUTTING CONDITIONS ➤ I072

DS3MHRB...SS

Corner radius, Medium, 3 flute, For stainless steel

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	DCON=.1875"	.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	DCON=.7500"
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"

- 3 flute radius end mill for stainless steel.
- Helix angle 45°.

Unit : Inch

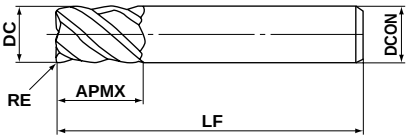
Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
DS3MHRBD1/8R0.008SS	.1250	.008	.375	1.500	.1250	3	●	1
DS3MHRB**D3/16R0.008SS**	.1875	.008	.563	2.000	.1875	3	●	1
DS3MHRB**D1/4R0.015SS**	.2500	.015	.750	2.500	.2500	3	●	1
DS3MHRB**D5/16R0.015SS**	.3125	.015	.813	2.500	.3125	3	□	1
DS3MHRB**D3/8R0.020SS**	.3750	.020	1.000	2.500	.3750	3	●	1
DS3MHRB**D7/16R0.020SS**	.4375	.020	1.000	2.750	.4375	3	□	1
DS3MHRB**D1/2R0.030SS**	.5000	.030	1.250	3.000	.5000	3	●	1
DS3MHRB**D5/8R0.030SS**	.6250	.030	1.625	3.500	.6250	3	●	1
DS3MHRB**D3/4R0.035SS**	.7500	.035	1.625	4.000	.7500	3	□	1

DS5SHRB...SS

Corner radius, Short, 5 flute, For stainless steel

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	DCON=.7500"		
0 - .00035"	0 - .00043"	0 - .00051"		

- 5 flute radius end mill for stainless steel.
- Helix angle 45°.

Unit : Inch

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
DS5SHRBD1/4R0.015SS	.2500	.015	.375	2.000	.2500	5	●	1
DS5SHRB**D5/16R0.015SS**	.3125	.015	.438	2.000	.3125	5	□	1
DS5SHRB**D3/8R0.020SS**	.3750	.020	.500	2.000	.3750	5	●	1
DS5SHRB**D7/16R0.020SS**	.4375	.020	.563	2.500	.4375	5	□	1
DS5SHRB**D1/2R0.030SS**	.5000	.030	.625	2.500	.5000	5	●	1
DS5SHRB**D5/8R0.030SS**	.6250	.030	.750	3.000	.6250	5	●	1
DS5SHRB**D3/4R0.035SS**	.7500	.035	1.000	3.000	.7500	5	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

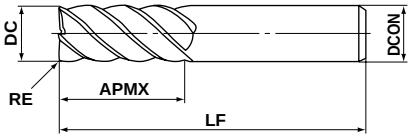
CUTTING CONDITIONS ➤ I072

DS5MHRB...SS

Corner radius, Medium, 5 flute, For stainless steel

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
.2500≤DCON≤.3750"	.4375≤DCON≤.6250"	DCON=.7500"		
0 - .00035"	0 - .00043"	0 - .00051"		

- 5 flute radius end mill for stainless steel.
- Helix angle 45°.

Unit : Inch

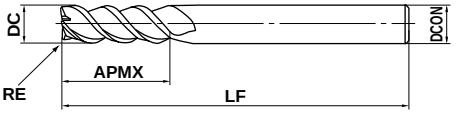
Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
DS5MHRBD1/4R0.015SS	.2500	.015	.750	2.500	.2500	5	●	1
DS5MHRB**D5/16R0.015SS**	.3125	.015	.813	2.500	.3125	5	●	1
DS5MHRB**D3/8R0.020SS**	.3750	.020	1.000	2.500	.3750	5	●	1
DS5MHRB**D7/16R0.020SS**	.4375	.020	1.000	2.750	.4375	5	□	1
DS5MHRB**D1/2R0.030SS**	.5000	.030	1.250	3.000	.5000	5	●	1
DS5MHRB**D5/8R0.030SS**	.6250	.030	1.625	3.500	.6250	5	●	1
DS5MHRB**D3/4R0.035SS**	.7500	.035	1.625	4.000	.7500	5	●	1

DS3MHHRB

Corner radius, High helix, Medium, 3 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	.2500≤DCON≤.3750"	.5000≤DCON≤.6250"		
0 - .00024"	0 - .00035"	0 - .00043"		

- 3 flute high helix radius end mill.
- Suitable for difficult-to-cut material.

Unit : Inch

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
DS3MHHRBD1/8R0.008	.1250	.008	.375	1.500	.1250	3	●	1
DS3MHHRB**D1/4R0.015**	.2500	.015	.750	2.500	.2500	3	●	1
DS3MHHRB**D1/4R0.030**	.2500	.030	.750	2.500	.2500	3	●	1
DS3MHHRB**D3/8R0.020**	.3750	.020	.875	2.500	.3750	3	●	1
DS3MHHRB**D3/8R0.040**	.3750	.040	.875	2.500	.3750	3	●	1
DS3MHHRB**D1/2R0.015**	.5000	.015	1.000	3.000	.5000	3	●	1
DS3MHHRB**D1/2R0.030**	.5000	.030	1.000	3.000	.5000	3	●	1
DS3MHHRB**D1/2R0.060**	.5000	.060	1.000	3.000	.5000	3	●	1
DS3MHHRB**D5/8R0.030**	.6250	.030	1.250	3.500	.6250	3	●	1
DS3MHHRB**D5/8R0.060**	.6250	.060	1.250	3.500	.6250	3	●	1

● : Inventory maintained.

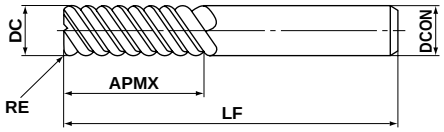
CUTTING CONDITIONS ➤ I072

DS6MHHRB

Corner radius, High helix, Medium, 6 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		





Type 1

DC≤.2500"	DC>.2500"			
0 - .002"	0 - .003"			
DCON=.1250"	.2500≤DCON≤.3750"	.5000≤DCON≤.6250"		
0 - .00024"	0 - .00035"	0 - .00043"		

- 6 flute high helix radius end mill.
- Suitable for difficult-to-cut material.

Unit : Inch

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
DS6MHHRBD1/8R0.008	.1250	.008	.375	1.500	.1250	6	●	1
DS6MHHRB**D1/4R0.015**	.2500	.015	.750	2.500	.2500	6	●	1
DS6MHHRB**D1/4R0.030**	.2500	.030	.750	2.500	.2500	6	●	1
DS6MHHRB**D3/8R0.020**	.3750	.020	.875	2.500	.3750	6	●	1
DS6MHHRB**D3/8R0.040**	.3750	.040	.875	2.500	.3750	6	●	1
DS6MHHRB**D1/2R0.015**	.5000	.015	1.000	3.000	.5000	6	●	1
DS6MHHRB**D1/2R0.030**	.5000	.030	1.000	3.000	.5000	6	●	1
DS6MHHRB**D1/2R0.060**	.5000	.060	1.000	3.000	.5000	6	●	1
DS6MHHRB**D5/8R0.030**	.6250	.030	1.250	3.500	.6250	6	●	1
DS6MHHRB**D5/8R0.060**	.6250	.060	1.250	3.500	.6250	6	●	1

APPLICATION CHART

Square End Mill, Corner Radius End Mill

DS2SS (➔I036), DS2MS (➔I037), DS2LS (➔I038), DS3SC (➔I039), DS3MC (➔I040), DS4SC (➔I041), DS4MC (➔I042), DS4LC (➔I043), DS4MC...CB (➔I051), DS4LC...CB (➔I052), DS2SRB (➔I053), DS2MRB (➔I054), DS4SRB (➔I055), DS4MRB (➔I056)

	MATERIAL	HRC / BHN	SFM *	.016"—.125" IPT	.141"—.250" IPT	.281"—.500" IPT	.563"—.750" IPT	.750"—1.250" IPT	Slotting-max D.O.C.
STEELS	Carbon Steel	150—250 BHN	160—500	.0002—.0005	.0008—.0015	.0015—.003	.002—.003	.003—.005	.3—.5DC
	Steel Alloys	—45 HRC	130—350	.0002—.0005	.0008—.0015	.0015—.003	.002—.003	.003	.3—.5DC
	Steel Alloys	45—55 HRC	100—160	.0001—.0004	.0005—.001	.001—.002	.002	.003	.05—.2DC
STAINLESS STEELS	300	140—185 BHN	100—300	.0001—.0005	.0008—.0015	.0015—.003	.002—.003	.003—.004	.3—.5DC
	400	180—200 BHN	125—350	.0001—.0005	.0008—.0015	.0015—.003	.002—.003	.003—.004	.3—.5DC
	Heat Resistant	32—43 HRC	100—300	.0001—.0004	.0005—.001	.001—.002	.002	.002	.05—.2DC
CAST IRON	Gray Cast Iron	180—260 BHN	150—550	.0002—.0005	.0008—.0015	.0015—.003	.002—.003	.003—.005	.3—.5DC
	Ductile Cast Iron	220—260 BHN	150—550	.0002—.0005	.0008—.0015	.0015—.003	.002—.003	.003—.005	.3—.5DC
NON-FERROUS	Aluminum Alloys	180—220 BHN	300—1000	.0002—.0005	.001—.002	.002—.003	.003—.004	.004—.005	.5—1DC
	Copper Alloys	60—120 BHN	200—500	.0002—.0005	.0008—.0015	.0015—.003	.002—.003	.003—.005	.3—.5DC
	Plastics	—	300—1500	.0002—.0005	.001—.002	.002—.003	.003—.004	.004—.005	.5—1DC
Ti	Titanium	300—350 BHN	70—300	.0003—.0006	.0006—.001	.001—.003	.003—.004	.004—.007	.3—.5DC

STAINLESS STEEL Square End Mill, Corner Radius End Mill

DS3MHH60 (➔I049), DS6MHH60 (➔I050), DS3SH...SS (➔I060), DS3MH...SS (➔I061), DS5MH...SS (➔I062), DS5LH...SS (➔I063), DS3SHRB...SS (➔I066), DS3MHRB...SS (➔I067), DS5SHRB...SS (➔I068), DS5MHRB...SS (➔I069), DS3MHHRB (➔I070), DS6MHHRB (➔I071)

	MATERIAL	HRC / BHN	SFM *	.125" IPT	.141"—.250" IPT	.281"—.500" IPT	.563"—.750" IPT	.750" IPT	Slotting-max D.O.C.
STAINLESS STEELS	304 316	130—190 BHN	150—300	.0005	.0008—.0015	.0015—.003	.002—.003	.003	.3—.5DC
	405 410 430	180—200 BHN	200—500	.0005	.0008—.0015	.0015—.003	.002—.003	.003	.3—.5DC
	405 410 430	30—37 HRC	130—500	.0005	.0008—.0015	.0015—.003	.002—.003	.003	.3—.5DC
	PH	35—42 HRC	150—200	.0004	.0005—.001	.001—.002	.002	.002	.05—.2DC

ALUMINUM Square End Mill, Corner Radius End Mill

DS2SRB...A (➔I057), DS2SRB...NA (➔I058), DS3MHR...A (➔I059)

	MATERIAL	HRC / BHN	SFM *	.141"—.250" IPT	.281"—.500" IPT	.563"—.750" IPT	.750"—1" IPT	Slotting-max D.O.C.
ALUMINUM	Aluminum Cast	40—100 BHN	700—1500	.001—.002	.002—.003	.003—.004	.004—.006	.5—1DC
	Aluminum Alloys <5% silicon	40—100 BHN	700—1500	.001—.002	.002—.003	.003—.004	.004—.006	.5—1DC
	Aluminum Alloys >5% silicon	60—120 BHN	450—1000	.001—.002	.002—.003	.003—.004	.004—.006	.5—1DC

* Please decrease speed by 25% when using extra length end mills.
* Speed may be increased by 25% when using stub length end mills.
* When slotting, please decrease speed by 20%.

APPLICATION CHART

Ball Nose End Mill

DS2SB (➔I044), DS2LB (➔I045), DS3SB (➔I046), DS4SB (➔I047), DS4LB (➔I048)

	MATERIAL	HRC / BHN	SFM *	.016"–.125" IPT	.141"–.250" IPT	.281"–.500" IPT	.563"–.750" IPT	.750"–1" IPT	Slotting-max D.O.C.
STEELS	Carbon Steel	150–250 BHN	160–900	.0001–.0005	.001–.0015	.0015–.003	.003–.005	.005–.006	.1–.25DC
	Steel Alloys	–45 HRC	160–750	.0001–.0004	.001–.0012	.0012–.003	.003–.005	.005–.006	.1–.25DC
	Steel Alloys	45–55 HRC	160–600	.0001–.0004	.0008–.0012	.0012–.003	.003–.004	.004–.005	.1–.25DC
STAINLESS STEELS	400	180–200 BHN	160–750	.0001–.0004	.001–.0012	.0012–.003	.003–.005	.005–.006	.1–.25DC
	Heat Resistant	32–43 HRC	150–400	.0001–.0004	.0008–.0012	.0012–.003	.003–.004	.004–.005	.1–.25DC
CAST IRON	Gray Cast Iron	180–260 BHN	160–900	.0001–.0005	.001–.0015	.0015–.003	.003–.005	.005–.006	.1–.25DC
	Ductile Cast Iron	220–260 BHN	160–900	.0001–.0005	.001–.0015	.0015–.003	.003–.005	.005–.006	.1–.25DC
NON-FERROUS	Aluminum Alloys	180–220 BHN	300–1500	.0001–.0008	.001–.002	.0015–.004	.004–.006	.006–.008	.2–.5DC
	Copper Alloys	60–120 BHN	160–900	.0001–.0005	.001–.0015	.0015–.003	.003–.005	.005–.006	.1–.25DC
	Plastics	–	300–1500	.0001–.0008	.001–.002	.0015–.004	.004–.006	.006–.008	.2–.5DC
Ti	Titanium	300–350 BHN	100–300	.0001–.0004	.0008–.0012	.0012–.003	.003–.004	.004–.005	.1–.25DC

STAINLESS STEEL Ball Nose End Mill

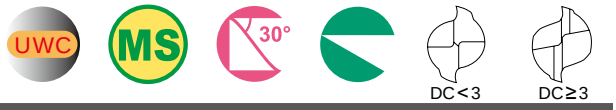
DS3SHB...SS (➔I064), DS3MHB...SS (➔I065)

	MATERIAL	HRC / BHN	SFM *	.125" IPT	.141"–.250" IPT	.281"–.500" IPT	.563"–.750" IPT	.750" IPT	Slotting-max D.O.C.
STAINLESS STEELS	304 316	130–190 BHN	250–500	.0003–.0004	.001–.0012	.0012–.003	.003–.005	.004–.005	.1–.25DC
	405 410 430	180–200 BHN	200–600	.0003–.0004	.001–.0012	.0012–.003	.003–.005	.005–.006	.1–.25DC
	405 410 430	30–37 HRC	130–500	.0003–.0004	.001–.0012	.0012–.003	.003–.005	.005–.006	.1–.25DC
	PH	35–42 HRC	150–350	.0003–.0004	.0008–.0012	.0012–.003	.003–.004	.004–.005	.1–.25DC

* Please decrease speed by 25% when using extra length end mills.
* Speed may be increased by 25% when using stub length end mills.
* When slotting, please decrease speed by 20%.

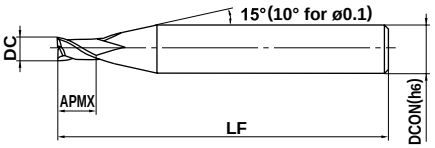
MS2SS

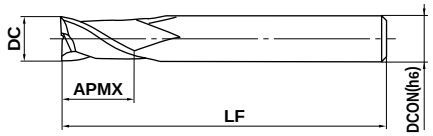
End mill, Short cut length, 2 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		







DC=0.1	DC>0.1			
0 - 0.010	0 - 0.020			
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

● 2 flute end mill for general use.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2SSD0010	0.1	0.15	40	4	2	★	1
MS2SS**D0020**	0.2	0.3	40	4	2	★	1
MS2SS**D0030**	0.3	0.45	40	4	2	★	1
MS2SS**D0040**	0.4	0.6	40	4	2	★	1
MS2SS**D0050**	0.5	0.75	40	4	2	★	1
MS2SS**D0060**	0.6	0.9	40	4	2	★	1
MS2SS**D0070**	0.7	1.1	40	4	2	★	1
MS2SS**D0080**	0.8	1.2	40	4	2	★	1
MS2SS**D0090**	0.9	1.4	40	4	2	★	1
MS2SS**D0100**	1	1.5	40	4	2	★	1
MS2SS**D0120**	1.2	1.8	40	4	2	★	1
MS2SS**D0150**	1.5	2.3	40	4	2	★	1
MS2SS**D0180**	1.8	2.7	40	4	2	★	1
MS2SS**D0200**	2	3	40	4	2	★	1
MS2SS**D0250**	2.5	3.8	40	4	2	★	1
MS2SS**D0300**	3	4.5	45	6	2	★	1
MS2SS**D0400**	4	6	50	6	2	★	1
MS2SS**D0500**	5	7.5	50	6	2	★	1
MS2SS**D0600**	6	9	50	6	2	★	2
MS2SS**D0700**	7	10.5	60	8	2	★	1
MS2SS**D0800**	8	12	60	8	2	★	2
MS2SS**D0900**	9	13.5	70	10	2	★	1
MS2SS**D1000**	10	15	70	10	2	★	2
MS2SS**D1100**	11	16.5	75	12	2	★	1
MS2SS**D1200**	12	18	75	12	2	★	2

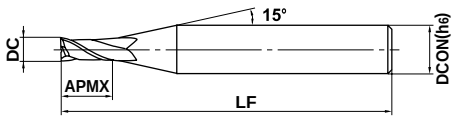
● : Inventory maintained. ★ : Inventory maintained in Japan.

MS2MS

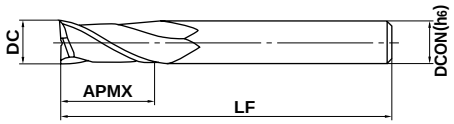
End mill, Medium cut length, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		

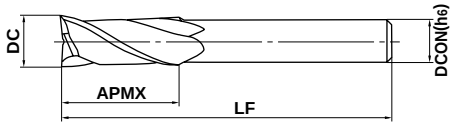




Type 1



Type 2



Type 3

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

h6

● 2 flute end mill for general use.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2MSD0020	0.2	0.4	40	4	2	●	1
MS2MS**D0030**	0.3	0.6	40	4	2	●	1
MS2MS**D0040**	0.4	0.8	40	4	2	●	1
MS2MS**D0050**	0.5	1	40	4	2	●	1
MS2MS**D0060**	0.6	1.2	40	4	2	●	1
MS2MS**D0070**	0.7	1.4	40	4	2	●	1
MS2MS**D0080**	0.8	1.6	40	4	2	●	1
MS2MS**D0090**	0.9	1.8	40	4	2	●	1
MS2MS**D0100**	1	2	40	4	2	●	1
MS2MS**D0110**	1.1	2.2	40	4	2	●	1
MS2MS**D0120**	1.2	2.4	40	4	2	●	1
MS2MS**D0130**	1.3	2.6	40	4	2	●	1
MS2MS**D0140**	1.4	2.8	40	4	2	●	1
MS2MS**D0150**	1.5	3	40	4	2	●	1
MS2MS**D0160**	1.6	3.2	40	4	2	●	1
MS2MS**D0170**	1.7	3.4	40	4	2	●	1
MS2MS**D0180**	1.8	3.6	40	4	2	●	1
MS2MS**D0190**	1.9	3.8	40	4	2	●	1
MS2MS**D0200**	2	4	40	4	2	●	1
MS2MS**D0210**	2.1	4.2	40	4	2	●	1
MS2MS**D0220**	2.2	4.4	40	4	2	●	1
MS2MS**D0230**	2.3	4.6	40	4	2	●	1
MS2MS**D0240**	2.4	4.8	40	4	2	●	1
MS2MS**D0250**	2.5	5	40	4	2	●	1
MS2MS**D0260**	2.6	5.2	40	4	2	●	1
MS2MS**D0270**	2.7	5.4	40	4	2	●	1
MS2MS**D0280**	2.8	5.6	40	4	2	●	1
MS2MS**D0290**	2.9	5.8	40	4	2	●	1
MS2MS**D0300**	3	6	45	6	2	●	1
MS2MS**D0310**	3.1	6.2	45	6	2	★	1
MS2MS**D0320**	3.2	6.4	45	6	2	★	1

MS2MS

End mill, Medium cut length, 2 flute

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2MSD0330	3.3	6.6	45	6	2	★	1
MS2MS**D0340**	3.4	6.8	45	6	2	★	1
MS2MS**D0350**	3.5	7	45	6	2	★	1
MS2MS**D0360**	3.6	7.2	45	6	2	★	1
MS2MS**D0370**	3.7	7.4	45	6	2	★	1
MS2MS**D0380**	3.8	7.6	45	6	2	★	1
MS2MS**D0390**	3.9	7.8	45	6	2	★	1
MS2MS**D0400**	4	8	50	6	2	●	1
MS2MS**D0410**	4.1	8.2	50	6	2	★	1
MS2MS**D0420**	4.2	8.4	50	6	2	★	1
MS2MS**D0430**	4.3	8.6	50	6	2	★	1
MS2MS**D0440**	4.4	8.8	50	6	2	★	1
MS2MS**D0450**	4.5	9	50	6	2	★	1
MS2MS**D0460**	4.6	9.2	50	6	2	★	1
MS2MS**D0470**	4.7	9.4	50	6	2	★	1
MS2MS**D0480**	4.8	9.6	50	6	2	★	1
MS2MS**D0490**	4.9	9.8	50	6	2	★	1
MS2MS**D0500**	5	10	50	6	2	●	1
MS2MS**D0510**	5.1	10.2	50	6	2	★	1
MS2MS**D0520**	5.2	10.4	50	6	2	★	1
MS2MS**D0530**	5.3	10.6	50	6	2	★	1
MS2MS**D0540**	5.4	10.8	50	6	2	★	1
MS2MS**D0550**	5.5	11	50	6	2	★	1
MS2MS**D0560**	5.6	11.2	50	6	2	★	1
MS2MS**D0570**	5.7	11.4	50	6	2	★	1
MS2MS**D0580**	5.8	11.6	50	6	2	★	1
MS2MS**D0590**	5.9	11.8	50	6	2	★	1
MS2MS**D0600**	6	12	50	6	2	●	2
MS2MS**D0650**	6.5	13	60	8	2	★	1
MS2MS**D0700**	7	14	60	8	2	★	1
MS2MS**D0750**	7.5	15	60	8	2	★	1
MS2MS**D0800**	8	16	60	8	2	●	2
MS2MS**D0850**	8.5	17	70	10	2	★	1
MS2MS**D0900**	9	18	70	10	2	★	1
MS2MS**D0950**	9.5	19	70	10	2	★	1
MS2MS**D1000**	10	20	70	10	2	●	2
MS2MS**D1100**	11	22	75	12	2	★	1
MS2MS**D1200**	12	24	75	12	2	●	2
MS2MS**D1600**	16	32	90	16	2	★	2
MS2MS**D1800**	18	36	90	16	2	★	3
MS2MS**D2000**	20	40	100	20	2	★	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

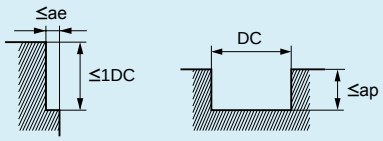
MS2SS
End mill, Short cut length, 2 flute

MS2MS
End mill, Medium cut length, 2 flute

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.				Hardened steel (45—55HRC) AISI H13 etc.			
DC (mm)	Revolution (min^{-1})	Table feed		Depth of cut ae, ap (mm)	Revolution (min^{-1})	Table feed		Depth of cut ae, ap (mm)
		(mm/min)	(IPM)			(mm/min)	(IPM)	
0.1	40000	40	1.6	0.001	40000	40	1.6	0.001
0.2	40000	100	3.9	0.002	40000	100	3.9	0.002
0.3	40000	200	7.9	0.005	40000	200	7.9	0.005
0.4	40000	600	23.6	0.01	40000	600	23.6	0.01
0.5	40000	1000	39.4	0.015	40000	960	37.8	0.015
0.6	40000	1200	47.2	0.02	40000	1200	47.2	0.02
0.7	40000	1400	55.1	0.02	40000	1400	55.1	0.02
0.8	40000	1600	63.0	0.03	40000	1600	63.0	0.03
0.9	40000	1800	70.9	0.04	40000	1600	63.0	0.04
1	40000	2000	78.7	0.06	32000	1600	63.0	0.06
1.5	40000	3000	118.1	0.12	32000	1900	74.8	0.08
2	30000	3000	118.1	0.18	24000	1900	74.8	0.10
2.5	24000	2600	102.4	0.25	19000	1600	63.0	0.13
3	20000	2300	90.6	0.30	16000	1400	55.1	0.15
4	15000	2000	78.7	0.40	12000	1200	47.2	0.20
5	12000	1600	63.0	0.50	9000	900	35.4	0.25
6	10000	1400	55.1	0.60	7000	700	27.6	0.30
8	8000	1000	39.4	0.80	5600	550	21.7	0.40
10	6400	900	35.4	1.00	4500	500	19.7	0.50
12	5400	820	32.3	1.00	3800	450	17.7	0.50
16	2400	380	15.0	≤3	1200	100	3.9	≤0.8
20	1900	320	12.6	≤4	1000	80	3.1	≤1

Depth of cut



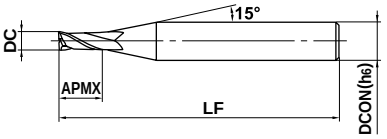
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) In case of slotting with over 3 mm endmill, please reduce revolution to 50—70% of above value, and reduce feed rate to 40—60% of above value.
3) When drilling, please set the feed rate at 1/3 or below of the above value.
4) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MS2MD

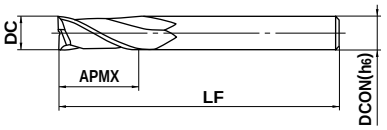
End mill, Medium cut length, 2 flute, Strong geometry type

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

1≤DC≤12				
0 - 0.020				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

h6

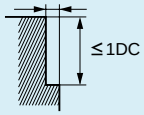
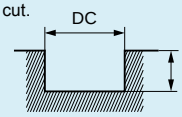
● Strong edge type, 2 flute end mill with high resistance to corner fracturing.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2MDD0100	1	2.5	40	4	2	★	1
MS2MD**D0150**	1.5	3.8	40	4	2	★	1
MS2MD**D0200**	2	5	40	4	2	★	1
MS2MD**D0250**	2.5	6.3	40	4	2	★	1
MS2MD**D0300**	3	7.5	50	6	2	★	1
MS2MD**D0400**	4	10	50	6	2	★	1
MS2MD**D0500**	5	12.5	50	6	2	★	1
MS2MD**D0600**	6	15	50	6	2	★	2
MS2MD**D0800**	8	20	60	8	2	★	2
MS2MD**D1000**	10	25	70	10	2	★	2
MS2MD**D1200**	12	30	90	12	2	★	2

★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.				Hardened steel (45-55HRC) AISI H13 etc.			
DC (mm)	Revolution (min^{-1})	Table feed		Depth of cut (mm)	Revolution (min^{-1})	Table feed		Depth of cut (mm)
		(mm/min)	(IPM)			(mm/min)	(IPM)	
1	40000	2000	78.7	0.06	32000	1600	63.0	0.06
1.5	40000	3000	118.1	0.12	32000	1900	74.8	0.08
2	30000	3000	118.1	0.18	24000	1900	74.8	0.10
2.5	24000	2600	102.4	0.25	19000	1600	63.0	0.13
3	20000	2300	90.6	0.30	16000	1400	55.1	0.15
4	15000	2000	78.7	0.40	12000	1200	47.2	0.20
5	12000	1600	63.0	0.50	9000	900	35.4	0.25
6	10000	1400	55.1	0.60	7000	700	27.6	0.30
8	8000	1000	39.4	0.80	5600	550	21.7	0.40
10	6400	900	35.4	1.00	4500	500	19.7	0.50
12	5400	820	32.3	1.00	3800	450	17.7	0.50
Depth of cut	≤Please refer to the list above for depth of cut.   ≤Please refer to the list above for depth of cut.							

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) When drilling, please set the feed rate at 1/3 or below of the above value.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

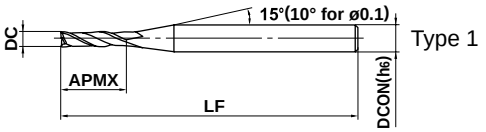
MS2JS

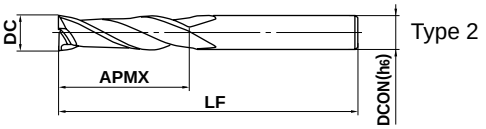
End mill, Semi long cut length, 2 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		







DC=0.1	DC>0.1			
0 - 0.010	0 - 0.020			
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

h6

● 2 flute end mill for general use.

Unit : mm

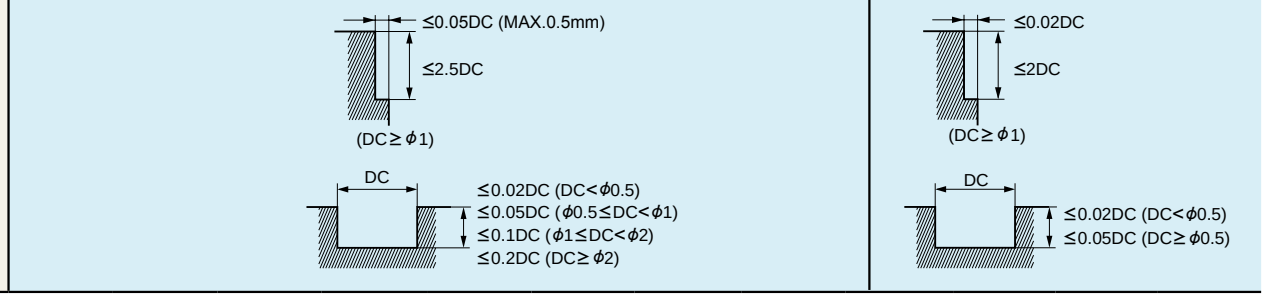
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2JSD0010	0.1	0.3	40	4	2	●	1
MS2JS**D0020**	0.2	0.6	40	4	2	●	1
MS2JS**D0030**	0.3	0.9	40	4	2	●	1
MS2JS**D0040**	0.4	1.2	40	4	2	●	1
MS2JS**D0050**	0.5	1.5	40	4	2	●	1
MS2JS**D0060**	0.6	1.8	40	4	2	●	1
MS2JS**D0070**	0.7	2.1	40	4	2	●	1
MS2JS**D0080**	0.8	2.4	40	4	2	●	1
MS2JS**D0090**	0.9	2.7	40	4	2	●	1
MS2JS**D0100**	1	3	40	4	2	●	1
MS2JS**D0120**	1.2	3.6	40	4	2	●	1
MS2JS**D0150**	1.5	4.5	40	4	2	●	1
MS2JS**D0180**	1.8	5.4	40	4	2	●	1
MS2JS**D0200**	2	6	40	4	2	●	1
MS2JS**D0250**	2.5	7.5	40	4	2	●	1
MS2JS**D0300**	3	9	45	6	2	●	1
MS2JS**D0400**	4	12	50	6	2	●	1
MS2JS**D0500**	5	15	50	6	2	●	1
MS2JS**D0600**	6	18	50	6	2	●	2
MS2JS**D0800**	8	24	70	8	2	●	2
MS2JS**D1000**	10	30	90	10	2	●	2
MS2JS**D1200**	12	36	90	12	2	●	2

● : Inventory maintained.

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45—55HRC) AISI H13 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
0.1	40000	— (40)	— (1.6)	40000	— (40)	— (1.6)	40000	— (35)	— (1.4)	40000	— (25)	— (1.0)
0.2	40000	— (45)	— (1.8)	40000	— (45)	— (1.8)	40000	— (35)	— (1.4)	32000	— (25)	— (1.0)
0.3	40000	— (55)	— (2.2)	32000	— (45)	— (1.8)	27000	— (35)	— (1.4)	21000	— (25)	— (1.0)
0.4	32000	— (60)	— (2.4)	24000	— (45)	— (1.8)	20000	— (35)	— (1.4)	16000	— (25)	— (1.0)
0.5	25000	— (60)	— (2.4)	19000	— (45)	— (1.8)	16000	— (35)	— (1.4)	13000	— (25)	— (1.0)
0.6	21000	— (60)	— (2.4)	16000	— (45)	— (1.8)	13000	— (35)	— (1.4)	11000	— (25)	— (1.0)
0.7	18000	— (60)	— (2.4)	14000	— (45)	— (1.8)	11000	— (35)	— (1.4)	9100	— (25)	— (1.0)
0.8	16000	— (60)	— (2.4)	12000	— (45)	— (1.8)	9900	— (35)	— (1.4)	8000	— (25)	— (1.0)
0.9	14000	— (60)	— (2.4)	11000	— (45)	— (1.8)	8800	— (35)	— (1.4)	7100	— (25)	— (1.0)
1	13000	60 (60)	2.4 (2.4)	9500	45 (45)	1.8 (1.8)	8000	35 (35)	1.4 (1.4)	6400	25 (25)	1.0 (1.0)
1.5	8500	60 (60)	2.4 (2.4)	6400	45 (45)	1.8 (1.8)	5300	35 (35)	1.4 (1.4)	4200	25 (25)	1.0 (1.0)
2	6400	60 (60)	2.4 (2.4)	4800	45 (45)	1.8 (1.8)	4000	35 (35)	1.4 (1.4)	3200	25 (25)	1.0 (1.0)
2.5	5100	60 (60)	2.4 (2.4)	3800	45 (45)	1.8 (1.8)	3200	40 (40)	1.6 (1.6)	2500	25 (25)	1.0 (1.0)
3	4200	65 (60)	2.6 (2.4)	3400	55 (45)	2.2 (1.8)	2600	40 (40)	1.6 (1.6)	2100	25 (25)	1.0 (1.0)
4	3400	80 (60)	3.1 (2.4)	2700	65 (45)	2.6 (1.8)	2100 (1600)	50 (30)	2.0 (1.2)	1700	35 (25)	1.4 (1.0)
5	2900	100 (60)	3.9 (2.4)	2300	80 (45)	3.1 (1.8)	1800 (1350)	60 (30)	2.4 (1.2)	1500	40 (25)	1.6 (1.0)
6	2500	120 (60)	4.7 (2.4)	2000	100 (50)	3.9 (2.0)	1500 (1100)	75 (30)	3.0 (1.2)	1300	50 (25)	2.0 (1.0)
8	1900	130 (60)	5.1 (2.4)	1500	100 (50)	3.9 (2.0)	1200 (900)	80 (30)	3.1 (1.2)	1000	50 (25)	2.0 (1.0)
10	1600	130 (60)	5.1 (2.4)	1300	100 (50)	3.9 (2.0)	950 (710)	75 (30)	3.0 (1.2)	800	50 (25)	2.0 (1.0)
12	1300	120 (60)	4.7 (2.4)	1100	100 (50)	3.9 (2.0)	800 (600)	75 (30)	3.0 (1.2)	670	50 (25)	2.0 (1.0)

Depth of cut



( ) : Indicates standard revolution and feed rate in slotting.

1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) When drilling, please set the feed rate at 1/3 or below of the above value.
4) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

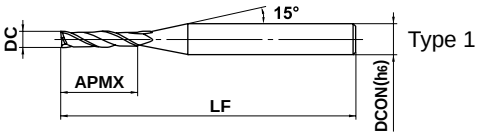
MS2LS

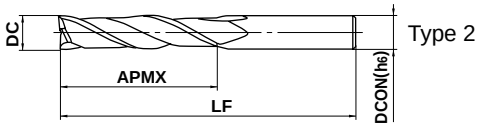
End mill, long cut length, 2 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		







0.2≤DC≤12				
0 - 0.020				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

h6

● 2 flute end mill for general use.

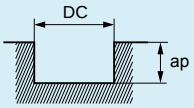
Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2LSD0020	0.2	0.8	40	4	2	★	1
MS2LS**D0030**	0.3	1.2	40	4	2	★	1
MS2LS**D0040**	0.4	1.6	40	4	2	★	1
MS2LS**D0050**	0.5	2	40	4	2	★	1
MS2LS**D0060**	0.6	2.4	40	4	2	★	1
MS2LS**D0070**	0.7	2.8	40	4	2	★	1
MS2LS**D0080**	0.8	3.2	40	4	2	★	1
MS2LS**D0090**	0.9	3.6	40	4	2	★	1
MS2LS**D0100**	1	4	40	4	2	★	1
MS2LS**D0150**	1.5	6	40	4	2	★	1
MS2LS**D0200**	2	8	40	4	2	★	1
MS2LS**D0250**	2.5	10	50	4	2	★	1
MS2LS**D0300**	3	12	50	6	2	★	1
MS2LS**D0400**	4	16	50	6	2	★	1
MS2LS**D0500**	5	20	60	6	2	★	1
MS2LS**D0600**	6	24	60	6	2	★	2
MS2LS**D0800**	8	32	70	8	2	★	2
MS2LS**D1000**	10	40	90	10	2	★	2
MS2LS**D1200**	12	48	110	12	2	★	2

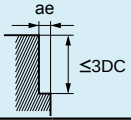
★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Slotting

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			
DC (mm)	Revolution (min^{-1})	Table feed		Depth of cut ap (mm)	Revolution (min^{-1})	Table feed		Depth of cut ap (mm)
		(mm/min)	(IPM)			(mm/min)	(IPM)	
0.2	40000	400	15.7	0.001	30000	250	9.8	0.001
0.3	40000	600	23.6	0.005	35000	420	16.5	0.005
0.4	40000	700	27.6	0.007	30000	420	16.5	0.007
0.5	40000	800	31.5	0.01	24000	380	15.0	0.01
0.6	33000	800	31.5	0.015	21000	480	18.9	0.01
0.7	28000	800	31.5	0.015	18000	480	18.9	0.015
0.8	25000	800	31.5	0.02	16000	480	18.9	0.02
0.9	22000	800	31.5	0.03	15000	500	19.7	0.03
1	20000	800	31.5	0.04	13000	500	19.7	0.04
1.5	13000	800	31.5	0.10	9000	500	19.7	0.10
2	10000	800	31.5	0.15	6700	500	19.7	0.15
2.5	9000	800	31.5	0.20	6000	500	19.7	0.20
3	8000	800	31.5	0.20	5200	460	18.1	0.20
4	6000	600	23.6	0.20	4000	340	13.4	0.20
5	4800	480	18.9	0.30	3200	280	11.0	0.20
6	4000	400	15.7	0.30	2600	210	8.3	0.20
8	3000	300	11.8	0.30	2000	170	6.7	0.30
10	2400	240	9.4	0.30	1600	140	5.5	0.30
12	2000	200	7.9	0.30	1300	110	4.3	0.30
Depth of cut								

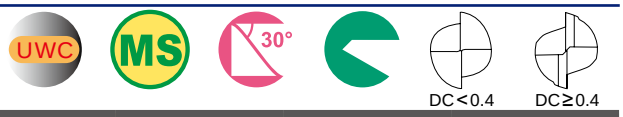
Shoulder milling

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			
DC (mm)	Revolution (min^{-1})	Table feed		Width of cut ae (mm)	Revolution (min^{-1})	Table feed		Width of cut ae (mm)
		(mm/min)	(IPM)			(mm/min)	(IPM)	
3	3500	370	14.6	0.05	2600	250	9.8	0.03
4	2800	370	14.6	0.06	2100	200	7.9	0.03
5	2200	330	13.0	0.06	1700	160	6.3	0.03
6	1800	300	11.8	0.06	1500	140	5.5	0.03
8	1600	270	10.6	0.08	1100	140	5.5	0.04
10	1400	240	9.4	0.10	900	140	5.5	0.05
12	1200	200	7.9	0.10	750	120	4.7	0.06
Depth of cut								

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) When drilling, please set the feed rate at 1/3 or below of the above value.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

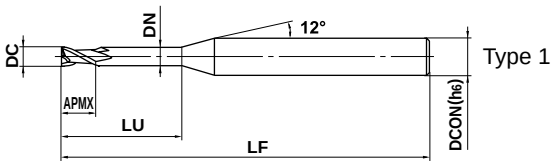
MS2XL

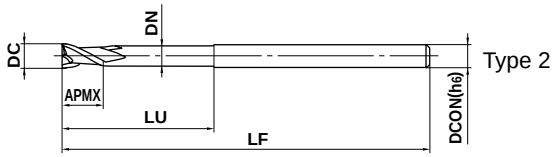
End mill, Short cut length, 2 flute, Long neck



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		







DC<0.5	DC≥0.5			
0 - 0.010	0 - 0.020			
4≤DCON≤6				
0 - 0.008				

● 2 flute long neck end mill.

Unit : mm

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XLD0020N005	0.2	0.3	0.5	0.17	45	4	2	★	1
MS2XL**D0020N010**	0.2	0.3	1	0.17	45	4	2	★	1
MS2XL**D0020N015**	0.2	0.3	1.5	0.17	45	4	2	★	1
MS2XL**D0030N010**	0.3	0.4	1	0.27	45	4	2	★	1
MS2XL**D0030N020**	0.3	0.4	2	0.27	45	4	2	★	1
MS2XL**D0030N030**	0.3	0.4	3	0.27	45	4	2	★	1
MS2XL**D0030N060**	0.3	0.4	6	0.27	45	4	2	★	1
MS2XL**D0030N090**	0.3	0.4	9	0.27	45	4	2	★	1
MS2XL**D0040N020**	0.4	0.6	2	0.36	45	4	2	★	1
MS2XL**D0040N030**	0.4	0.6	3	0.36	45	4	2	★	1
MS2XL**D0040N040**	0.4	0.6	4	0.36	45	4	2	★	1
MS2XL**D0040N080**	0.4	0.6	8	0.36	45	4	2	★	1
MS2XL**D0040N120**	0.4	0.6	12	0.36	45	4	2	★	1
MS2XL**D0050N020**	0.5	0.7	2	0.46	45	4	2	★	1
MS2XL**D0050N040**	0.5	0.7	4	0.46	45	4	2	●	1
MS2XL**D0050N060**	0.5	0.7	6	0.46	45	4	2	●	1
MS2XL**D0050N080**	0.5	0.7	8	0.46	50	4	2	●	1
MS2XL**D0050N100**	0.5	0.7	10	0.46	50	4	2	●	1
MS2XL**D0050N150**	0.5	0.7	15	0.46	50	4	2	●	1
MS2XL**D0060N020**	0.6	0.9	2	0.56	45	4	2	★	1
MS2XL**D0060N040**	0.6	0.9	4	0.56	45	4	2	★	1
MS2XL**D0060N060**	0.6	0.9	6	0.56	45	4	2	★	1
MS2XL**D0060N080**	0.6	0.9	8	0.56	50	4	2	★	1
MS2XL**D0060N100**	0.6	0.9	10	0.56	50	4	2	★	1
MS2XL**D0060N120**	0.6	0.9	12	0.56	50	4	2	★	1
MS2XL**D0060N180**	0.6	0.9	18	0.56	50	4	2	★	1
MS2XL**D0070N020**	0.7	1	2	0.66	45	4	2	★	1
MS2XL**D0070N040**	0.7	1	4	0.66	45	4	2	★	1
MS2XL**D0070N060**	0.7	1	6	0.66	45	4	2	★	1
MS2XL**D0070N080**	0.7	1	8	0.66	50	4	2	★	1
MS2XL**D0070N100**	0.7	1	10	0.66	50	4	2	★	1

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XLD0080N040	0.8	1.2	4	0.76	45	4	2	★	1
MS2XLD0080N060	0.8	1.2	6	0.76	45	4	2	★	1
MS2XLD0080N080	0.8	1.2	8	0.76	50	4	2	★	1
MS2XLD0080N100	0.8	1.2	10	0.76	50	4	2	★	1
MS2XLD0080N120	0.8	1.2	12	0.76	50	4	2	★	1
MS2XLD0080N160	0.8	1.2	16	0.76	50	4	2	★	1
MS2XLD0080N240	0.8	1.2	24	0.76	60	4	2	★	1
MS2XLD0090N060	0.9	1.4	6	0.86	45	4	2	★	1
MS2XLD0090N080	0.9	1.4	8	0.86	50	4	2	★	1
MS2XLD0090N100	0.9	1.4	10	0.86	50	4	2	★	1
MS2XLD0090N150	0.9	1.4	15	0.86	60	4	2	★	1
MS2XLD0100N040	1	1.5	4	0.94	50	4	2	●	1
MS2XLD0100N060	1	1.5	6	0.94	50	4	2	●	1
MS2XLD0100N080	1	1.5	8	0.94	50	4	2	●	1
MS2XLD0100N100	1	1.5	10	0.94	50	4	2	●	1
MS2XLD0100N120	1	1.5	12	0.94	50	4	2	●	1
MS2XLD0100N160	1	1.5	16	0.94	60	4	2	●	1
MS2XLD0100N200	1	1.5	20	0.94	60	4	2	●	1
MS2XLD0100N250	1	1.5	25	0.94	70	4	2	★	1
MS2XLD0100N300	1	1.5	30	0.94	70	4	2	★	1
MS2XLD0120N060	1.2	1.8	6	1.14	50	4	2	★	1
MS2XLD0120N080	1.2	1.8	8	1.14	50	4	2	★	1
MS2XLD0120N100	1.2	1.8	10	1.14	50	4	2	★	1
MS2XLD0120N120	1.2	1.8	12	1.14	50	4	2	★	1
MS2XLD0120N160	1.2	1.8	16	1.14	60	4	2	★	1
MS2XLD0120N200	1.2	1.8	20	1.14	60	4	2	★	1
MS2XLD0150N060	1.5	2.3	6	1.44	50	4	2	★	1
MS2XLD0150N080	1.5	2.3	8	1.44	50	4	2	★	1
MS2XLD0150N100	1.5	2.3	10	1.44	50	4	2	★	1
MS2XLD0150N120	1.5	2.3	12	1.44	50	4	2	★	1
MS2XLD0150N140	1.5	2.3	14	1.44	60	4	2	★	1
MS2XLD0150N160	1.5	2.3	16	1.44	60	4	2	★	1
MS2XLD0150N180	1.5	2.3	18	1.44	60	4	2	★	1
MS2XLD0150N200	1.5	2.3	20	1.44	60	4	2	★	1
MS2XLD0150N250	1.5	2.3	25	1.44	70	4	2	★	1
MS2XLD0150N300	1.5	2.3	30	1.44	70	4	2	★	1
MS2XLD0150N380	1.5	2.3	38	1.44	80	4	2	★	1
MS2XLD0150N450	1.5	2.3	45	1.44	80	4	2	★	1
MS2XLD0200N060	2	3	6	1.9	50	4	2	★	1
MS2XLD0200N080	2	3	8	1.9	50	4	2	★	1
MS2XLD0200N100	2	3	10	1.9	50	4	2	●	1
MS2XLD0200N120	2	3	12	1.9	50	4	2	★	1
MS2XLD0200N140	2	3	14	1.9	60	4	2	●	1
MS2XLD0200N160	2	3	16	1.9	60	4	2	●	1
MS2XLD0200N180	2	3	18	1.9	60	4	2	★	1
MS2XLD0200N200	2	3	20	1.9	60	4	2	●	1
MS2XLD0200N250	2	3	25	1.9	70	4	2	●	1
MS2XLD0200N300	2	3	30	1.9	70	4	2	●	1
MS2XLD0200N350	2	3	35	1.9	80	4	2	★	1
MS2XLD0200N400	2	3	40	1.9	90	4	2	★	1
MS2XLD0200N500	2	3	50	1.9	100	4	2	★	1

MS2XL

End mill, Short cut length, 2 flute, Long neck

Unit : mm

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XLD0200N600	2	3	60	1.9	110	4	2	★	1
MS2XL**D0250N080**	2.5	3.7	8	2.4	50	4	2	★	1
MS2XL**D0250N120**	2.5	3.7	12	2.4	50	4	2	●	1
MS2XL**D0250N160**	2.5	3.7	16	2.4	60	4	2	●	1
MS2XL**D0250N200**	2.5	3.7	20	2.4	60	4	2	●	1
MS2XL**D0250N250**	2.5	3.7	25	2.4	70	4	2	●	1
MS2XL**D0250N300**	2.5	3.7	30	2.4	70	4	2	●	1
MS2XL**D0250N400**	2.5	3.7	40	2.4	90	4	2	★	1
MS2XL**D0250N500**	2.5	3.7	50	2.4	100	4	2	★	1
MS2XL**D0300N080**	3	4.5	8	2.8	50	6	2	★	1
MS2XL**D0300N120**	3	4.5	12	2.8	50	6	2	★	1
MS2XL**D0300N160**	3	4.5	16	2.8	60	6	2	●	1
MS2XL**D0300N200**	3	4.5	20	2.8	60	6	2	●	1
MS2XL**D0300N250**	3	4.5	25	2.8	70	6	2	●	1
MS2XL**D0300N300**	3	4.5	30	2.8	70	6	2	●	1
MS2XL**D0300N400**	3	4.5	40	2.8	90	6	2	●	1
MS2XL**D0300N500**	3	4.5	50	2.8	100	6	2	★	1
MS2XL**D0400N120**	4	6	12	3.8	50	6	2	★	1
MS2XL**D0400N160**	4	6	16	3.8	60	6	2	★	1
MS2XL**D0400N200**	4	6	20	3.8	60	6	2	★	1
MS2XL**D0400N250**	4	6	25	3.8	70	6	2	★	1
MS2XL**D0400N300**	4	6	30	3.8	70	6	2	★	1
MS2XL**D0400N350**	4	6	35	3.8	80	6	2	★	1
MS2XL**D0400N400**	4	6	40	3.8	90	6	2	★	1
MS2XL**D0400N450**	4	6	45	3.8	90	6	2	★	1
MS2XL**D0400N500**	4	6	50	3.8	100	6	2	★	1
MS2XL**D0400N600**	4	6	60	3.8	110	6	2	★	1
MS2XL**D0500N160**	5	7.5	16	4.8	60	6	2	●	1
MS2XL**D0500N250**	5	7.5	25	4.8	70	6	2	●	1
MS2XL**D0500N350**	5	7.5	35	4.8	80	6	2	●	1
MS2XL**D0500N500**	5	7.5	50	4.8	110	6	2	●	1
MS2XL**D0500N600**	5	7.5	60	4.8	120	6	2	★	1
MS2XL**D0600N200**	6	9	20	5.8	80	6	2	★	2
MS2XL**D0600N300**	6	9	30	5.8	90	6	2	★	2
MS2XL**D0600N400**	6	9	40	5.8	100	6	2	★	2
MS2XL**D0600N500**	6	9	50	5.8	110	6	2	★	2
MS2XL**D0600N600**	6	9	60	5.8	120	6	2	★	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Work material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.			
DC (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
0.2	0.5	40000	600	23.6	0.004
	1	40000	400	15.7	0.001
0.3	1	40000	650	25.6	0.007
	3	40000	500	19.7	0.002
	9	22000	150	5.9	0.001
0.4	2	40000	800	31.5	0.007
	4	40000	800	31.5	0.003
	12	17000	150	5.9	0.001
0.5	2	40000	950	37.4	0.01
	6	40000	700	27.6	0.003
	10	25000	400	15.7	0.002
	15	14000	150	5.9	0.001
0.6	2	40000	950	37.4	0.01
	6	40000	800	31.5	0.005
	10	25000	450	17.7	0.003
	18	12000	150	5.9	0.001
0.7	2	40000	1000	39.4	0.02
	6	40000	900	35.4	0.01
	8	30000	700	27.6	0.005
	10	11000	300	11.8	0.005
0.8	4	40000	1200	47.2	0.02
	8	40000	1000	39.4	0.01
	12	25000	400	15.7	0.003
	24	10000	150	5.9	0.001
0.9	6	40000	1300	51.2	0.02
	10	35000	1000	39.4	0.01
	15	9000	400	15.7	0.003
1	6	40000	1600	63.0	0.04
	8	40000	1600	63.0	0.03
	12	30000	1000	39.4	0.02
	20	15000	400	15.7	0.005
	30	8000	150	5.9	0.001
1.2	6	40000	1900	74.8	0.06
	8	40000	1900	74.8	0.04
	12	25000	1000	39.4	0.03
	20	6500	150	5.9	0.01

Work material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.			
DC (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
1.5	6	40000	2400	94.5	0.10
	10	30000	1800	70.9	0.05
	20	15000	600	23.6	0.02
	30	7500	300	11.8	0.005
	45	5000	150	5.9	0.001
1.6	6	40000	2400	94.5	0.12
	10	30000	1800	70.9	0.07
	16	20000	1000	39.4	0.04
2	6	40000	2400	94.5	0.18
	10	30000	1800	70.9	0.10
	16	20000	1000	39.4	0.06
	30	8000	500	19.7	0.04
	40	6000	250	9.8	0.01
	60	4200	150	5.9	0.003
2.5	8	25000	2500	98.4	0.20
	16	18000	1700	66.9	0.10
	20	12000	1000	39.4	0.08
	40	8000	400	15.7	0.03
	50	4000	150	5.9	0.015
3	8	20000	2000	78.7	0.30
	16	15000	1400	55.1	0.15
	20	10000	800	31.5	0.10
	40	5000	250	9.8	0.02
	50	3700	150	5.9	0.01
4	12	15000	3000	118.1	0.30
	20	11000	2200	86.6	0.22
	30	6400	1200	47.2	0.12
	40	4500	400	15.7	0.05
	50	2800	150	5.9	0.018
	60	1800	60	2.6	0.005
5	16	12000	2500	98.4	0.35
	35	5100	750	29.5	0.15
	60	2200	150	5.9	0.02
6	20	10000	2000	78.7	0.40
	40	4200	800	31.5	0.20
	60	1900	150	5.9	0.10

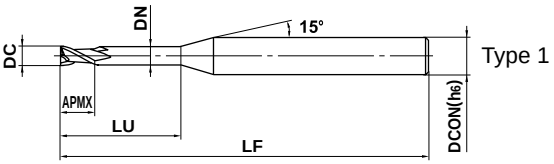
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

MS2XL6

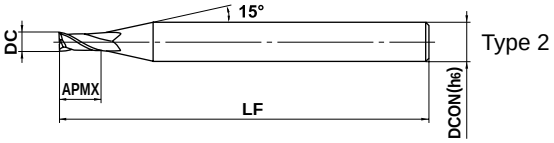
End mill, Short cut length, 2 flute, 6mm shank

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

0.3≤DC≤2.5				
0 - 0.020				
DCON=6				
0 - 0.008				

- 2 flute long neck end mill.
- ϕ6 shank type.

Unit : mm

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XL6D0030N008	0.3	0.8	—	—	50	6	2	●	2
MS2XL6**D0030N015**	0.3	0.5	1.5	0.27	50	6	2	●	1
MS2XL6**D0040N010**	0.4	0.6	1	0.36	50	6	2	●	1
MS2XL6**D0040N020**	0.4	0.6	2	0.36	50	6	2	●	1
MS2XL6**D0050N013**	0.5	0.8	1.3	0.46	50	6	2	●	1
MS2XL6**D0050N025**	0.5	0.8	2.5	0.46	50	6	2	●	1
MS2XL6**D0060N015**	0.6	0.9	1.5	0.56	50	6	2	●	1
MS2XL6**D0060N030**	0.6	0.9	3	0.56	50	6	2	●	1
MS2XL6**D0070N018**	0.7	1.1	1.8	0.66	50	6	2	●	1
MS2XL6**D0070N035**	0.7	1.1	3.5	0.66	50	6	2	●	1
MS2XL6**D0080N020**	0.8	1.2	2	0.76	50	6	2	●	1
MS2XL6**D0080N040**	0.8	1.2	4	0.76	50	6	2	●	1
MS2XL6**D0090N023**	0.9	1.4	2.3	0.86	50	6	2	●	1
MS2XL6**D0090N045**	0.9	1.4	4.5	0.86	50	6	2	●	1
MS2XL6**D0100N025**	1	1.5	2.5	0.94	50	6	2	●	1
MS2XL6**D0100N050**	1	1.5	5	0.94	50	6	2	●	1
MS2XL6**D0110N028**	1.1	1.7	2.8	1.04	50	6	2	●	1
MS2XL6**D0110N055**	1.1	1.7	5.5	1.04	50	6	2	●	1
MS2XL6**D0120N030**	1.2	1.8	3	1.14	50	6	2	●	1
MS2XL6**D0120N060**	1.2	1.8	6	1.14	50	6	2	●	1
MS2XL6**D0130N033**	1.3	2	3.3	1.24	50	6	2	●	1
MS2XL6**D0130N065**	1.3	2	6.5	1.24	50	6	2	●	1
MS2XL6**D0140N035**	1.4	2.1	3.5	1.34	50	6	2	●	1
MS2XL6**D0140N070**	1.4	2.1	7	1.34	50	6	2	●	1
MS2XL6**D0150N038**	1.5	2.3	3.8	1.44	50	6	2	●	1
MS2XL6**D0150N075**	1.5	2.3	7.5	1.44	50	6	2	●	1
MS2XL6**D0160N040**	1.6	2.4	4	1.54	50	6	2	●	1
MS2XL6**D0160N080**	1.6	2.4	8	1.54	50	6	2	●	1
MS2XL6**D0170N043**	1.7	2.6	4.3	1.64	50	6	2	●	1
MS2XL6**D0170N085**	1.7	2.6	8.5	1.64	50	6	2	●	1
MS2XL6**D0180N045**	1.8	2.7	4.5	1.74	50	6	2	●	1

● : Inventory maintained.

Unit : mm

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XL6D0180N090	1.8	2.7	9	1.74	50	6	2	●	1
MS2XL6**D0190N048**	1.9	2.9	4.8	1.84	50	6	2	●	1
MS2XL6**D0190N095**	1.9	2.9	9.5	1.84	50	6	2	●	1
MS2XL6**D0200N050**	2	3	5	1.90	50	6	2	●	1
MS2XL6**D0200N100**	2	3	10	1.90	50	6	2	●	1
MS2XL6**D0210N053**	2.1	3.2	5.3	2.00	50	6	2	●	1
MS2XL6**D0210N105**	2.1	3.2	10.5	2.00	60	6	2	●	1
MS2XL6**D0220N055**	2.2	3.3	5.5	2.10	50	6	2	●	1
MS2XL6**D0220N110**	2.2	3.3	11	2.10	60	6	2	●	1
MS2XL6**D0230N058**	2.3	3.5	5.8	2.20	50	6	2	●	1
MS2XL6**D0230N115**	2.3	3.5	11.5	2.20	60	6	2	●	1
MS2XL6**D0240N060**	2.4	3.6	6	2.30	50	6	2	●	1
MS2XL6**D0240N120**	2.4	3.6	12	2.30	60	6	2	●	1
MS2XL6**D0250N063**	2.5	3.8	6.3	2.40	50	6	2	●	1
MS2XL6**D0250N125**	2.5	3.8	12.5	2.40	60	6	2	●	1

MS2XL6

End mill, Short cut length, 2 flute, 6mm shank

RECOMMENDED CUTTING CONDITIONS

Work material		Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			
DC (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut per pass (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut per pass (mm)
0.3	0.8	40000	500−1000	19.7−39.4	0.01	30000	300−800	11.8−31.5	0.01
	1.5				0.007				0.007
0.4	1	40000	500−1000	19.7−39.4	0.015	30000	300−800	11.8−31.5	0.015
	2				0.01				0.01
0.5	1.3	40000	500−1000	19.7−39.4	0.02	30000	300−800	11.8−31.5	0.02
	2.5				0.013				0.013
0.6	1.5	33000	500−1000	19.7−39.4	0.03	25000	300−800	11.8−31.5	0.03
	3				0.018				0.018
0.7	1.8	29000	500−1000	19.7−39.4	0.04	22000	300−800	11.8−31.5	0.04
	3.5				0.025				0.025
0.8	2	25000	500−1000	19.7−39.4	0.06	20000	300−800	11.8−31.5	0.06
	4				0.03				0.03
0.9	2.3	22000	500−1000	19.7−39.4	0.08	18000	300−800	11.8−31.5	0.08
	4.5				0.05				0.05
1	2.5	20000	500−1000	19.7−39.4	0.1	16000	300−800	11.8−31.5	0.1
	5				0.07				0.07
1.1	2.8	18000	500−1000	19.7−39.4	0.12	14000	300−800	11.8−31.5	0.12
	5.5				0.08				0.08
1.2	3	16000	500−1000	19.7−39.4	0.12	13000	300−800	11.8−31.5	0.12
	6				0.08				0.08
1.3	3.3	15000	500−1000	19.7−39.4	0.12	12000	300−800	11.8−31.5	0.12
	6.5				0.08				0.08
1.4	3.5	14000	500−1000	19.7−39.4	0.12	11000	300−800	11.8−31.5	0.12
	7				0.08				0.08
1.5	3.8	13000	500−1000	19.7−39.4	0.15	10000	300−800	11.8−31.5	0.15
	7.5				0.1				0.1
1.6	4	12000	500−1000	19.7−39.4	0.15	10000	300−800	11.8−31.5	0.15
	8				0.1				0.1
1.7	4.3	12000	500−1000	19.7−39.4	0.17	9500	300−800	11.8−31.5	0.17
	8.5				0.12				0.12
1.8	4.5	11000	500−1000	19.7−39.4	0.17	9000	300−800	11.8−31.5	0.17
	9				0.12				0.12
1.9	4.8	10000	500−1000	19.7−39.4	0.17	9000	300−800	11.8−31.5	0.17
	9.5				0.12				0.12
2	5	10000	500−1000	19.7−39.4	0.2	9000	300−800	11.8−31.5	0.2
	10				0.15				0.15
2.1	5.3	9800	500−1000	19.7−39.4	0.2	9000	300−800	11.8−31.5	0.2
	10.5				0.15				0.15
2.2	5.5	9600	500−1000	19.7−39.4	0.2	9000	300−800	11.8−31.5	0.2
	11				0.15				0.15
2.3	5.8	9400	500−1000	19.7−39.4	0.2	8800	300−800	11.8−31.5	0.2
	11.5				0.15				0.15
2.4	6	9200	500−1000	19.7−39.4	0.25	8700	300−800	11.8−31.5	0.25
	12				0.2				0.2
2.5	6.3	9000	500−1000	19.7−39.4	0.25	8500	300−800	11.8−31.5	0.25
	12.5				0.2				0.2

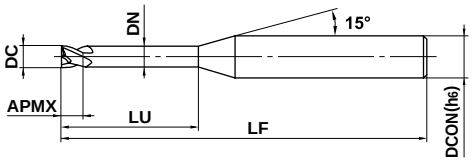
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

MS2XL – Inch sizes

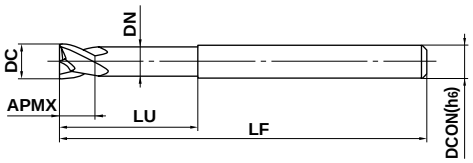
Square, 2 flute, Long neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

0 - .0008"				
DCON=.1250"	DCON=.1875"	DCON=.2500"		
0 - .00024"	0 - .00031"	0 - .00035"		

● 2 flute, long neck, square end mill for general purpose.

Unit : inch

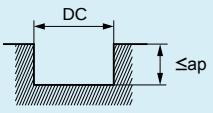
Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XLD1/64N0094	.0156	.0156	.0938	.0144	2.0	.1250	2	●	1
MS2XLD**1/64N0125**	.0156	.0156	.1250	.0144	2.0	.1250	2	●	1
MS2XLD**1/64N0187**	.0156	.0156	.1875	.0144	2.0	.1250	2	●	1
MS2XLD**1/32N0187**	.0313	.0313	.1875	.0301	2.0	.1250	2	●	1
MS2XLD**1/32N0250**	.0313	.0313	.2500	.0301	2.0	.1250	2	●	1
MS2XLD**1/32N0375**	.0313	.0313	.3750	.0301	2.0	.1250	2	●	1
MS2XLD**1/16N0375**	.0625	.0625	.3750	.0601	2.0	.1250	2	●	1
MS2XLD**1/16N0500**	.0625	.0625	.5000	.0601	2.0	.1250	2	●	1
MS2XLD**1/16N0750**	.0625	.0625	.7500	.0601	2.0	.1250	2	●	1
MS2XLD**3/32N0562**	.0938	.0938	.5625	.0898	2.0	.1250	2	●	1
MS2XLD**3/32N0750**	.0938	.0938	.7500	.0898	2.0	.1250	2	●	1
MS2XLD**3/32N1125**	.0938	.0938	1.1250	.0898	2.5	.1250	2	●	1
MS2XLD**1/8N0750**	.1250	.1250	.7500	.1211	2.0	.1250	2	●	2
MS2XLD**3/16N1125**	.1875	.1875	1.1250	.1836	2.5	.1875	2	●	2
MS2XLD**1/4N1500**	.2500	.2500	1.5000	.2441	3.0	.2500	2	●	2

● : Inventory maintained.

MS2XL – Inch sizes

Square, 2 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

Work material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.		
DC (inch)	**LU** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)
.0156	.0938	40000	17.0	.0002
	.1250	30000	10.6	.0002
	.1875	20000	5.6	.0001
.0313	.1875	40000	56.7	.0008
	.2500	25000	26.6	.0008
	.3750	15000	10.6	.0004
.0625	.3750	40000	90.7	.0028
	.5000	30000	51.0	.0016
	.7500	10000	10.6	.0008
.0938	.5625	33000	81.8	.003
	.7500	20000	42.5	.002
	1.1250	10000	14.1	.001
.1250	.7500	25000	72.4	.004
.1875	1.1250	17000	54.2	.006
.2500	1.5000	13000	55.3	.008
Depth of cut				

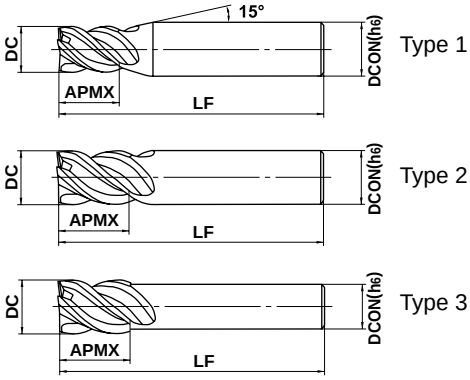
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

MSSHD

High power, Short cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		◎	◎		





h6

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● 4 flute high power end mill.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MSSHDD0300	3	4.5	45	6	4	★	1
MSSHD**D0350**	3.5	5.3	45	6	4	★	1
MSSHD**D0400**	4	6	45	6	4	★	1
MSSHD**D0450**	4.5	6.8	45	6	4	★	1
MSSHD**D0500**	5	7.5	50	6	4	★	1
MSSHD**D0550**	5.5	8.3	50	6	4	★	1
MSSHD**D0600**	6	9	50	6	4	★	2
MSSHD**D0650**	6.5	9.8	60	8	4	★	1
MSSHD**D0700**	7	10.5	60	8	4	★	1
MSSHD**D0750**	7.5	11.3	60	8	4	★	1
MSSHD**D0800**	8	12	60	8	4	★	2
MSSHD**D0850**	8.5	12.8	70	10	4	★	1
MSSHD**D0900**	9	13.5	70	10	4	★	1
MSSHD**D0950**	9.5	14.3	70	10	4	★	1
MSSHD**D1000**	10	15	70	10	4	★	2
MSSHD**D1100**	11	16.5	75	12	4	★	1
MSSHD**D1200**	12	18	75	12	4	★	2
MSSHD**D1300**	13	19.5	75	12	4	★	3
MSSHD**D1400**	14	21	90	16	4	★	1
MSSHD**D1500**	15	22.5	90	16	4	★	1
MSSHD**D1600**	16	24	90	16	4	★	2
MSSHD**D1700**	17	25.5	100	16	4	★	3
MSSHD**D1800**	18	27	100	16	4	★	3
MSSHD**D1900**	19	28.5	110	20	4	★	1
MSSHD**D2000**	20	30	110	20	4	★	2

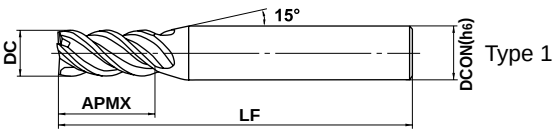
★ : Inventory maintained in Japan.

MSMHD

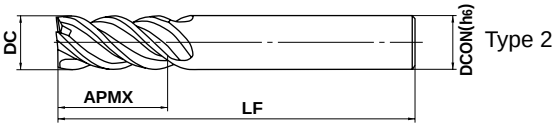
High power, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		◎	◎		

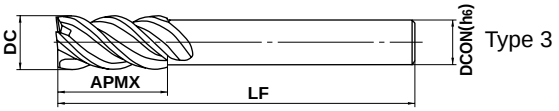




Type 1



Type 2



Type 3

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

h6

● 4 flute high power end mill.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MSMHDD0200	2	4	45	4	4	★	1
MSMHD**D0210**	2.1	5	45	4	4	★	1
MSMHD**D0220**	2.2	5	45	4	4	★	1
MSMHD**D0230**	2.3	5	45	4	4	★	1
MSMHD**D0240**	2.4	5	45	4	4	★	1
MSMHD**D0250**	2.5	5	45	4	4	★	1
MSMHD**D0260**	2.6	6	45	4	4	★	1
MSMHD**D0270**	2.7	6	45	4	4	★	1
MSMHD**D0280**	2.8	6	45	4	4	★	1
MSMHD**D0290**	2.9	6	45	4	4	★	1
MSMHD**D0300**	3	8	45	6	4	★	1
MSMHD**D0310**	3.1	8	45	6	4	★	1
MSMHD**D0320**	3.2	8	45	6	4	★	1
MSMHD**D0330**	3.3	8	45	6	4	★	1
MSMHD**D0340**	3.4	8	45	6	4	★	1
MSMHD**D0350**	3.5	8	45	6	4	★	1
MSMHD**D0360**	3.6	11	45	6	4	★	1
MSMHD**D0370**	3.7	11	45	6	4	★	1
MSMHD**D0380**	3.8	11	45	6	4	★	1
MSMHD**D0390**	3.9	11	45	6	4	★	1
MSMHD**D0400**	4	11	45	6	4	★	1
MSMHD**D0410**	4.1	12	45	6	4	★	1
MSMHD**D0420**	4.2	12	45	6	4	★	1
MSMHD**D0430**	4.3	12	45	6	4	★	1
MSMHD**D0440**	4.4	12	45	6	4	★	1
MSMHD**D0450**	4.5	12	45	6	4	★	1
MSMHD**D0460**	4.6	13	50	6	4	★	1
MSMHD**D0470**	4.7	13	50	6	4	★	1
MSMHD**D0480**	4.8	13	50	6	4	★	1
MSMHD**D0490**	4.9	13	50	6	4	★	1
MSMHD**D0500**	5	13	50	6	4	★	1

★ : Inventory maintained in Japan.

Unit : mm

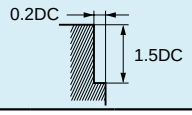
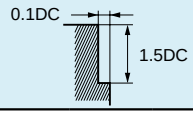
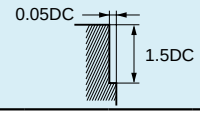
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MSMHDD0510	5.1	13	50	6	4	★	1
MSMHD**D0520**	5.2	13	50	6	4	★	1
MSMHD**D0530**	5.3	13	50	6	4	★	1
MSMHD**D0540**	5.4	13	50	6	4	★	1
MSMHD**D0550**	5.5	13	50	6	4	★	1
MSMHD**D0560**	5.6	13	50	6	4	★	1
MSMHD**D0570**	5.7	13	50	6	4	★	1
MSMHD**D0580**	5.8	13	50	6	4	★	1
MSMHD**D0590**	5.9	13	50	6	4	★	1
MSMHD**D0600**	6	13	50	6	4	★	2
MSMHD**D0650**	6.5	16	60	8	4	★	1
MSMHD**D0700**	7	19	60	8	4	★	1
MSMHD**D0750**	7.5	19	60	8	4	★	1
MSMHD**D0800**	8	19	60	8	4	★	2
MSMHD**D0850**	8.5	19	70	10	4	★	1
MSMHD**D0900**	9	22	70	10	4	★	1
MSMHD**D0950**	9.5	22	70	10	4	★	1
MSMHD**D1000**	10	22	70	10	4	★	2
MSMHD**D1100**	11	26	75	12	4	★	1
MSMHD**D1200S10**	12	26	75	10	4	★	3
MSMHD**D1200**	12	26	75	12	4	★	2
MSMHD**D1300**	13	26	75	12	4	★	3
MSMHD**D1400**	14	30	90	16	4	★	1
MSMHD**D1500**	15	35	90	16	4	★	1
MSMHD**D1600**	16	35	90	16	4	★	2
MSMHD**D1700**	17	35	100	16	4	★	3
MSMHD**D1800**	18	40	100	16	4	★	3
MSMHD**D1900**	19	40	110	20	4	★	1
MSMHD**D2000**	20	45	110	20	4	★	2
MSMHD**D2200**	22	50	125	20	4	★	3
MSMHD**D2500**	25	55	125	25	4	★	2

MSSHD
High power, Short cut length, 4 flute

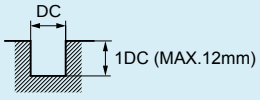
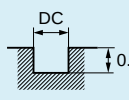
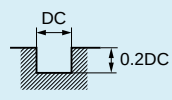
MSMHD
High power, Medium cut length, 4 flute

RECOMMENDED CUTTING CONDITIONS

Shoulder Milling

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
2	15000	550	21.7	10000	340	13.4	10000	320	12.6	6400	160	6.3	4800	100	3.9
3	11000	800	31.5	7400	500	19.7	7400	480	18.9	4800	250	9.8	4000	170	6.7
4	8000	900	35.4	5600	540	21.3	5600	520	20.5	3600	270	10.6	3200	240	9.4
5	6400	1000	39.4	4500	600	23.6	4500	580	22.8	2900	300	11.8	2600	240	9.4
6	5800	1100	43.3	3700	640	25.2	3700	600	23.6	2400	320	12.6	2100	230	9.1
8	4400	1100	43.3	2800	660	26.0	2800	600	23.6	1800	330	13.0	1600	220	8.7
10	3500	1000	39.4	2200	640	25.2	2200	560	22.0	1400	320	12.6	1300	200	7.9
12	2900	1000	39.4	1900	640	25.2	1900	530	20.9	1200	320	12.6	1100	170	6.7
16	2200	800	31.5	1400	500	19.7	1400	450	17.7	900	250	9.8	800	130	5.1
20	1800	750	29.5	1100	460	18.1	1100	440	17.3	720	230	9.1	640	100	3.9
25	1400	600	23.6	900	400	15.7	900	380	15.0	570	200	7.9	510	80	3.1
Depth of cut															

Slotting

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
2	12000	400	15.7	7000	200	7.9	7000	100	3.9	4200	80	3.1	2300	40	1.6
3	9000	600	23.6	5300	300	11.8	5300	150	5.9	3200	130	5.1	1900	70	2.8
4	7200	720	28.3	4000	360	14.2	4000	180	7.1	2400	140	5.5	1400	95	3.7
5	5800	720	28.3	3200	360	14.2	3200	180	7.1	1900	150	5.9	1100	95	3.7
6	5000	800	31.5	2700	400	15.7	2700	200	7.9	1600	160	6.3	950	95	3.7
8	3700	800	31.5	2000	400	15.7	2000	200	7.9	1200	170	6.7	720	90	3.5
10	3000	720	28.3	1600	360	14.2	1600	180	7.1	960	160	6.3	570	80	3.1
12	2500	720	28.3	1300	360	14.2	1300	180	7.1	800	160	6.3	480	70	2.8
16	2000	600	23.6	1000	280	11.0	1000	150	5.9	600	130	5.1	360	50	2.0
20	1600	540	21.3	800	250	9.8	800	130	5.1	480	120	4.7	290	40	1.6
25	1300	480	18.9	640	220	8.7	640	120	4.7	380	100	3.9	230	35	1.4
Depth of cut															

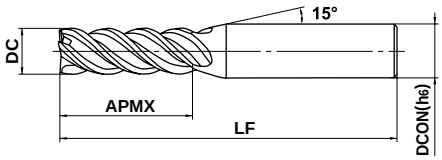
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MSJHD

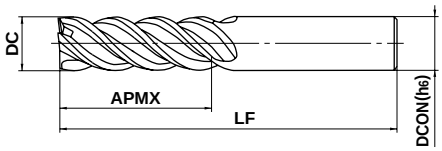
High power, Semi long cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		◎	◎		





Type 1



Type 2

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

h6

● 4 flute high power end mill.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MSJHDD0200	2	8	60	6	4	★	1
MSJHD**D0250**	2.5	10	60	6	4	★	1
MSJHD**D0300**	3	12	60	6	4	★	1
MSJHD**D0350**	3.5	14	60	6	4	★	1
MSJHD**D0400**	4	16	60	6	4	★	1
MSJHD**D0450**	4.5	18	60	6	4	★	1
MSJHD**D0500**	5	20	60	6	4	★	1
MSJHD**D0600**	6	24	60	6	4	★	2
MSJHD**D0700**	7	25	80	8	4	★	1
MSJHD**D0800**	8	28	80	8	4	★	2
MSJHD**D0900**	9	32	90	10	4	★	1
MSJHD**D1000**	10	35	90	10	4	★	2
MSJHD**D1100**	11	35	100	12	4	★	1
MSJHD**D1200**	12	36	100	12	4	★	2
MSJHD**D1400**	14	42	110	16	4	★	1
MSJHD**D1500**	15	45	110	16	4	★	1
MSJHD**D1600**	16	48	125	16	4	★	2
MSJHD**D2000**	20	55	140	20	4	★	2

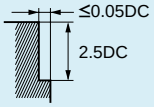
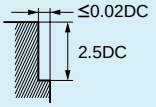
★ : Inventory maintained in Japan.

MSJHD

High power, Semi long cut length, 4 flute

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45—55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
2	11000	370	14.6	7000	230	9.1	7000	210	8.3	5000	100	3.9	3800	55	2.2
3	8000	550	21.7	5100	320	12.6	5100	300	11.8	3800	190	7.5	2500	80	3.1
4	6200	620	24.4	4000	350	13.8	4000	340	13.4	3000	210	8.3	1900	110	4.3
5	5000	670	26.4	3200	370	14.6	3200	360	14.2	2400	220	8.7	1500	110	4.3
6	4200	750	29.5	2600	400	15.7	2600	390	15.4	2000	220	8.7	1300	110	4.3
8	3200	780	30.7	2000	420	16.5	2000	400	15.7	1500	230	9.1	960	100	3.9
10	2500	690	27.2	1600	410	16.1	1600	380	15.0	1200	210	8.3	760	100	3.9
12	2100	670	26.4	1300	380	15.0	1300	340	13.4	1000	190	7.5	640	80	3.1
16	1600	570	22.4	1000	320	12.6	1000	280	11.0	750	170	6.7	480	65	2.6
20	1200	470	18.5	800	290	11.4	800	260	10.2	600	150	5.9	380	50	2.0
Depth of cut															

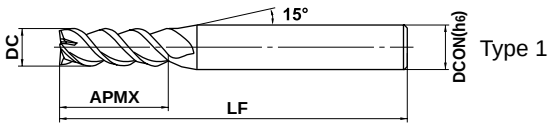
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MSMHZD

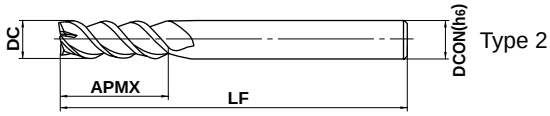
End mill, Medium cut length, 3 flute for drilling and slotting

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		◎	○		

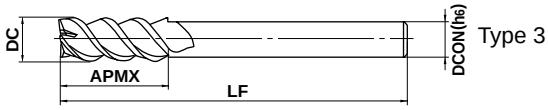




Type 1



Type 2



Type 3

h6

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
4≤DCON≤6	8≤CON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● 3 flute end mill for both drilling and slotting.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MSMHZDD0100	1	2	45	4	3	★	1
MSMHZD**D0150**	1.5	3	45	4	3	★	1
MSMHZD**D0200**	2	4	50	6	3	●	1
MSMHZD**D0250**	2.5	5	50	6	3	●	1
MSMHZD**D0300**	3	6	50	6	3	●	1
MSMHZD**D0350**	3.5	8	50	6	3	●	1
MSMHZD**D0400**	4	8	50	6	3	●	1
MSMHZD**D0450**	4.5	10	50	6	3	●	1
MSMHZD**D0500**	5	10	50	6	3	●	1
MSMHZD**D0550**	5.5	13	50	6	3	●	1
MSMHZD**D0600**	6	13	60	6	3	●	2
MSMHZD**D0650**	6.5	16	60	8	3	●	1
MSMHZD**D0700**	7	16	60	8	3	●	1
MSMHZD**D0750**	7.5	16	60	8	3	●	1
MSMHZD**D0800**	8	19	70	8	3	●	2
MSMHZD**D0850**	8.5	19	70	10	3	●	1
MSMHZD**D0900**	9	19	70	10	3	●	1
MSMHZD**D0950**	9.5	19	70	10	3	●	1
MSMHZD**D1000**	10	22	80	10	3	●	2
MSMHZD**D1100**	11	22	80	12	3	●	1
MSMHZD**D1200**	12	26	90	12	3	●	2
MSMHZD**D1300**	13	26	90	12	3	●	3
MSMHZD**D1400**	14	26	90	12	3	●	3
MSMHZD**D1500**	15	26	110	16	3	●	1
MSMHZD**D1600**	16	30	110	16	3	●	2
MSMHZD**D2000**	20	32	140	20	3	●	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

MSMHZD

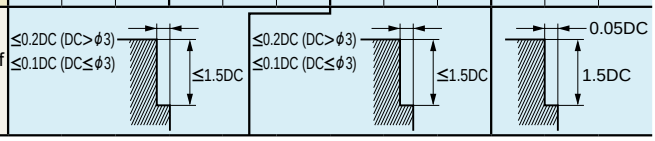
End mill, Medium cut length, 3 flute for drilling and slotting

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
1	19000	600	23.6	13000	310	12.2	10000	200	7.9	9500	65	2.6
1.5	14000	600	23.6	9000	310	12.2	7500	210	8.3	6400	75	3.0
2	11000	600	23.6	7200	310	12.2	6000	210	8.3	4800	75	3.0
3	8500	770	30.3	5300	380	15.0	4400	220	8.7	3200	100	3.9
4	7200	850	33.5	4400	480	18.9	3700	250	9.8	2400	130	5.1
6	5300	940	37.0	3200	490	19.3	2700	270	10.6	1600	130	5.1
8	4000	1010	39.8	2400	560	22.0	2000	280	11.0	1200	120	4.7
10	3200	1000	39.4	1900	480	18.9	1600	300	11.8	950	110	4.3
12	2700	950	37.4	1600	440	17.3	1300	300	11.8	800	90	3.5
16	2000	720	28.3	1200	350	13.8	1000	260	10.2	600	70	2.8
20	1600	600	23.6	1000	290	11.4	800	240	9.4	480	60	2.4

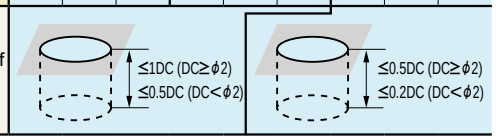
Depth of cut



Drilling

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
1	13000	80	3.1	10000	50	2.0	6000	10	0.4
1.5	12000	120	4.7	8000	80	3.1	6000	20	0.8
2	11000	200	7.9	7200	140	5.5	6000	30	1.2
3	8500	250	9.8	5300	180	7.1	4200	50	2.0
4	7200	300	11.8	4400	210	8.3	3300	60	2.4
6	5300	300	11.8	3200	210	8.3	2200	70	2.8
8	4000	320	12.6	2400	220	8.7	1600	80	3.1
10	3200	340	13.4	1900	240	9.4	1300	70	2.8
12	2700	320	12.6	1600	220	8.7	1100	70	2.8
16	2000	250	9.8	1200	180	7.1	800	55	2.2
20	1600	200	7.9	1000	140	5.5	640	55	2.2

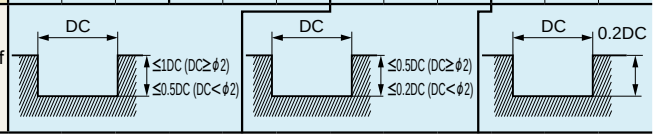
Depth of cut



Slotting

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
1	13000	130	5.1	10000	80	3.1	6000	30	1.2	5700	25	1.0
1.5	12000	250	9.8	8000	150	5.9	6000	60	2.4	3800	30	1.2
2	11000	500	19.7	7200	260	10.2	6000	130	5.1	2800	35	1.4
3	8500	640	25.2	5300	320	12.6	4200	130	5.1	1900	50	2.0
4	7200	650	25.6	4400	370	14.6	3300	140	5.5	1400	70	2.8
6	5300	720	28.3	3200	380	15.0	2200	140	5.5	950	70	2.8
8	4000	780	30.7	2400	430	16.9	1600	140	5.5	720	60	2.4
10	3200	770	30.3	1900	370	14.6	1300	150	5.9	570	50	2.0
12	2700	730	28.7	1600	340	13.4	1100	150	5.9	480	40	1.6
16	2000	600	23.6	1200	290	11.4	800	130	5.1	360	30	1.2
20	1600	500	19.7	1000	240	9.4	640	120	4.7	290	25	1.0

Depth of cut



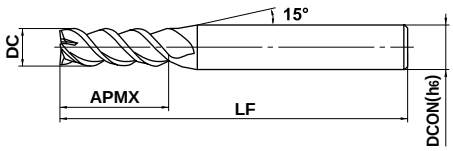
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MSMHZD – Inch sizes

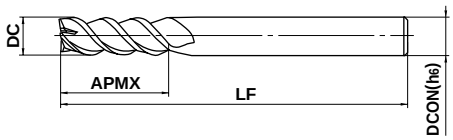
End mill, Medium cut length, 3 flute for drilling and slotting

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		◎	○		





Type 1



Type 2

h6

DC<.5000"	DC≥.5000"			
0 - .0008"	0 - .0012"			
.2500"≤DCON≤.3750"	.5000"≤DCON≤.6250"	DCON=.7500"		
0 - .00035"	0 - .00043"	0 - .00051"		

● 3 flute end mill for both drilling and slotting.

Unit : inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MSMHZDD1/16	.0625	.125	2.000	.2500	3	●	1
MSMHZD**D5/64**	.0781	.156	2.000	.2500	3	●	1
MSMHZD**D3/32**	.0938	.188	2.000	.2500	3	●	1
MSMHZD**D7/64**	.1094	.250	2.000	.2500	3	●	1
MSMHZD**D1/8**	.1250	.313	2.000	.2500	3	●	2
MSMHZD**D5/32**	.1563	.313	2.000	.2500	3	●	1
MSMHZD**D3/16**	.1875	.406	2.000	.2500	3	●	1
MSMHZD**D7/32**	.2188	.406	2.000	.2500	3	●	1
MSMHZD**D1/4**	.2500	.625	2.500	.2500	3	●	2
MSMHZD**D9/32**	.2813	.625	2.500	.3750	3	●	1
MSMHZD**D5/16**	.3125	.750	2.750	.3750	3	●	1
MSMHZD**D11/32**	.3438	.750	2.750	.3750	3	●	2
MSMHZD**D3/8**	.3750	.750	3.000	.3750	3	●	2
MSMHZD**D13/32**	.4060	.875	3.000	.5000	3	●	1
MSMHZD**D7/16**	.4380	.875	3.000	.5000	3	●	1
MSMHZD**D15/32**	.4690	1.000	3.500	.5000	3	●	2
MSMHZD**D1/2**	.5000	1.000	3.500	.5000	3	●	2
MSMHZD**D9/16**	.5630	1.000	3.500	.6250	3	●	1
MSMHZD**D5/8**	.6250	1.125	4.250	.6250	3	●	2
MSMHZD**D3/4**	.7500	1.250	5.500	.7500	3	●	1

● : Inventory maintained.

MSMHZD – Inch sizes

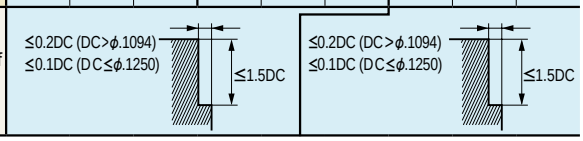
End mill, Medium cut length, 3 flute for drilling and slotting

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.		
DC (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
.0625	13000	550	21.7	8500	310	12.2	7100	200	7.9
.1250	8000	770	30.3	5100	380	15.0	4200	220	8.7
.1875	6300	880	34.6	3800	490	19.3	3200	250	9.8
.2500	5000	950	37.4	3000	500	19.7	2500	270	10.6
.3125	4000	1000	39.4	2400	560	22.0	2000	280	11.0
.3750	3300	1000	39.4	2000	490	19.3	1700	290	11.4
.4380	2900	970	38.2	1700	450	17.7	1400	300	11.8
.5000	2500	860	33.9	1500	420	16.5	1300	300	11.8
.5630	2200	790	31.1	1300	370	14.6	1100	280	11.0
.6250	2000	720	28.3	1200	350	13.8	1000	260	10.2
.7500	1700	610	24.0	1000	290	11.4	800	240	9.4

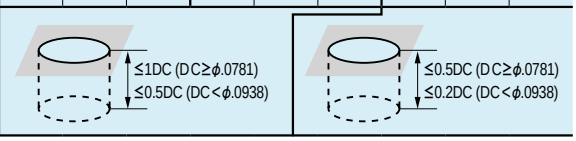
Depth of cut



Drilling

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.		
DC (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
.0625	11000	120	4.7	7600	80	3.1	6000	20	0.8
.1250	8000	260	10.2	5000	180	7.1	4000	50	2.0
.1875	6300	300	11.8	3800	210	8.3	2700	60	2.4
.2500	5000	310	12.2	3000	210	8.3	2000	70	2.8
.3125	4000	320	12.6	2400	220	8.7	1600	80	3.1
.3750	3300	330	13.0	2000	240	9.4	1300	70	2.8
.4380	2900	330	13.0	1700	220	8.7	1100	70	2.8
.5000	2500	310	12.2	1500	210	8.3	1000	70	2.8
.5630	2200	270	10.6	1300	180	7.1	900	60	2.4
.6250	2000	250	9.8	1200	180	7.1	800	55	2.2
.7500	1700	200	7.9	1000	140	5.5	700	55	2.2

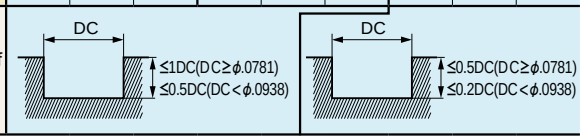
Depth of cut



Slotting

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.		
DC (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
.0625	11000	230	9.1	7600	150	5.9	6000	60	2.4
.1250	8000	600	23.6	5000	320	12.6	4000	130	5.1
.1875	6300	660	26.0	3800	360	14.2	2700	140	5.5
.2500	5000	720	28.3	3000	390	15.4	2000	140	5.5
.3125	4000	780	30.7	2400	430	16.9	1600	140	5.5
.3750	3300	740	29.1	2000	380	15.0	1300	150	5.9
.4380	2900	730	28.7	1700	340	13.4	1100	150	5.9
.5000	2500	700	27.6	1500	330	13.0	1000	140	5.5
.5630	2200	630	24.8	1300	300	11.8	900	140	5.5
.6250	2000	600	23.6	1200	290	11.4	800	130	5.1
.7500	1700	510	20.1	1000	240	9.4	700	120	4.7

Depth of cut



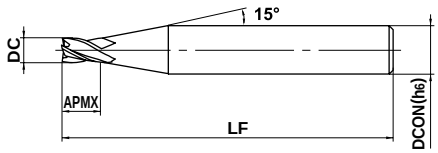
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MS4SC

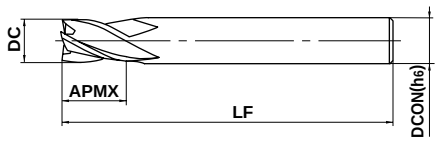
End mill, Short cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

1≤DC≤12				
0 - 0.020				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

h6

● 4 flute end mill for general use.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4SCD0100	1	1.5	40	4	4	★	1
MS4SC**D0150**	1.5	2.3	40	4	4	★	1
MS4SC**D0200**	2	3	40	4	4	★	1
MS4SC**D0250**	2.5	3.8	40	4	4	★	1
MS4SC**D0300**	3	4.5	50	6	4	★	1
MS4SC**D0400**	4	6	50	6	4	★	1
MS4SC**D0500**	5	7.5	50	6	4	★	1
MS4SC**D0600**	6	9	50	6	4	★	2
MS4SC**D0800**	8	12	60	8	4	★	2
MS4SC**D1000**	10	15	70	10	4	★	2
MS4SC**D1200**	12	18	75	12	4	★	2

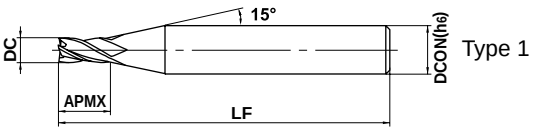
★ : Inventory maintained in Japan.

MS4MC

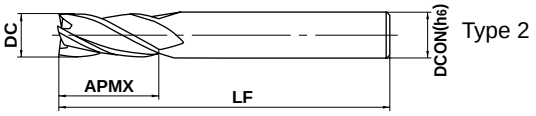
End mill, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		

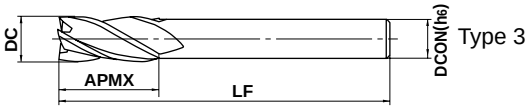




Type 1



Type 2



Type 3

h6

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● 4 flute end mill for general use.

Unit : mm

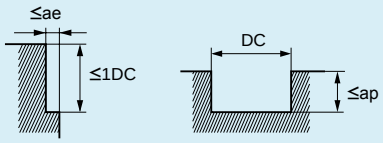
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4MCD0100	1	2.5	40	4	4	●	1
MS4MC**D0150**	1.5	3.8	40	4	4	●	1
MS4MC**D0200**	2	5	40	4	4	●	1
MS4MC**D0250**	2.5	6.3	40	4	4	●	1
MS4MC**D0300**	3	7.5	50	6	4	●	1
MS4MC**D0350**	3.5	9	50	6	4	★	1
MS4MC**D0400**	4	10	50	6	4	●	1
MS4MC**D0450**	4.5	11.5	50	6	4	★	1
MS4MC**D0500**	5	12.5	50	6	4	●	1
MS4MC**D0550**	5.5	14	50	6	4	★	1
MS4MC**D0600**	6	15	50	6	4	●	2
MS4MC**D0650**	6.5	16.5	60	8	4	★	1
MS4MC**D0700**	7	17.5	60	8	4	★	1
MS4MC**D0750**	7.5	19	60	8	4	★	1
MS4MC**D0800**	8	20	60	8	4	●	2
MS4MC**D0850**	8.5	21.5	70	10	4	★	1
MS4MC**D0900**	9	22.5	70	10	4	★	1
MS4MC**D0950**	9.5	24	70	10	4	★	1
MS4MC**D1000**	10	25	70	10	4	●	2
MS4MC**D1100**	11	27.5	75	12	4	★	1
MS4MC**D1200**	12	30	90	12	4	●	2
MS4MC**D1400**	14	35	90	12	4	★	3
MS4MC**D1600**	16	40	100	16	4	★	2
MS4MC**D1800**	18	45	100	16	4	★	3
MS4MC**D2000**	20	50	110	20	4	★	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

MS4SC
End mill, Short cut length, 4 flute

MS4MC
End mill, Medium cut length, 4 flute

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.				Hardened steel (45—55HRC) AISI H13 etc.			
DC (mm)	Revolution (min^{-1})	Table feed		Depth of cut ae, ap (mm)	Revolution (min^{-1})	Table feed		Depth of cut ae, ap (mm)
		(mm/min)	(IPM)			(mm/min)	(IPM)	
1	40000	3000	118.1	0.06	32000	2400	94.5	0.06
1.5	40000	4500	177.2	0.12	32000	3600	141.7	0.08
2	30000	4500	177.2	0.18	24000	3600	141.7	0.10
2.5	24000	3900	153.5	0.25	19000	3000	118.1	0.13
3	20000	3500	137.8	0.30	16000	2700	106.3	0.15
4	15000	3000	118.1	0.40	12000	2400	94.5	0.20
5	12000	2400	94.5	0.50	9000	1800	70.9	0.25
6	10000	2100	82.7	0.60	7000	1500	59.1	0.30
8	8000	1500	59.1	0.80	5600	1100	43.3	0.40
10	6400	1400	55.1	1.00	4500	950	37.4	0.50
12	5400	1200	47.2	1.00	3800	860	33.9	0.50
16	2400	550	21.7	≤3	1200	120	4.7	≤0.8
20	1900	480	18.9	≤4	1000	100	3.9	≤1
Depth of cut								

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) In case of slotting with over 3 mm endmill, please reduce revolution to 50—70% of above value, and reduce feed rate to 40—60% of above value.
3) When drilling, please set the feed rate at 1/3 or below of the above value.
4) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MS4JC

End mill, Semi long cut length, 4 flute








DC<3

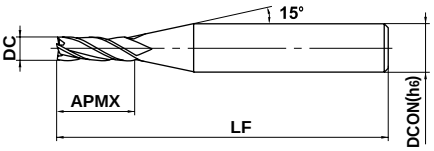
DC≥3

DC≥3

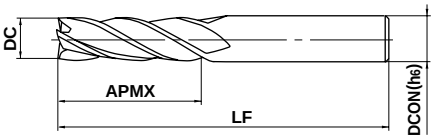
DC<3

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2




1≤DC≤12				
0 - 0.020				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

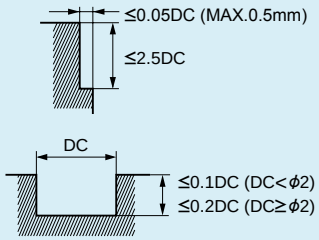
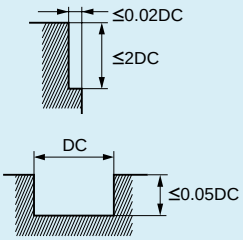
●4 flute end mill for general use.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4JCD0100	1	4	40	4	4	●	1
MS4JC**D0150**	1.5	6	40	4	4	●	1
MS4JC**D0200**	2	8	40	4	4	●	1
MS4JC**D0250**	2.5	10	50	4	4	●	1
MS4JC**D0300**	3	12	50	6	4	●	1
MS4JC**D0400**	4	16	50	6	4	●	1
MS4JC**D0500**	5	20	60	6	4	●	1
MS4JC**D0600**	6	24	60	6	4	●	2
MS4JC**D0800**	8	32	70	8	4	●	2
MS4JC**D1000**	10	40	90	10	4	●	2
MS4JC**D1200**	12	48	110	12	4	●	2

● : Inventory maintained.

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
1	11100	85	3.3	9500	65	2.6	8000	50	2.0	6400	35	1.4
1.5	7400	85	3.3	6400	90	3.5	5300	50	2.0	4200	35	1.4
2	5600	85	3.3	4800	90	3.5	4000	50	2.0	3200	35	1.4
2.5	4500	85	3.3	3800	90	3.5	3200	55	2.2	2500	35	1.4
3	3700	90	3.5	3400	90	3.5	2600	60	2.4	2100	35	1.4
4	3000	110	4.3	2700	90	3.5	2100	70	2.8	1700	50	2.0
5	2600	140	5.5	2300	110	4.3	1800	85	3.3	1500	55	2.2
6	2300	170	6.7	2000	140	5.5	1500	110	4.3	1300	70	2.8
8	1700	180	7.1	1500	140	5.5	1200	110	4.3	1000	70	2.8
10	1400	180	7.1	1300	140	5.5	950	110	4.3	800	70	2.8
12	1200	170	6.7	1100	140	5.5	800	110	4.3	670	70	2.8
Depth of cut												

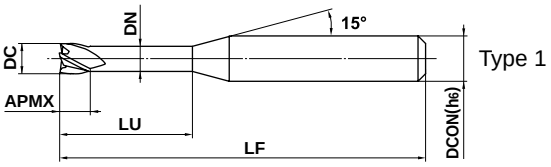
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) When drilling, please set the feed rate at 1/3 or below of the above value.
4) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MS4XL

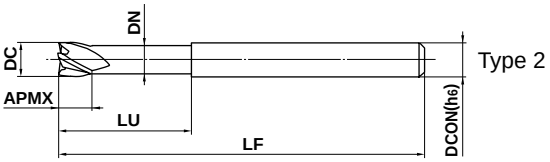
End mill, Short cut length, 4 flute, Long neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

1≤DC≤10				
0 - 0.020				
4≤DCON≤6	8≤DCON≤10			
0 - 0.008	0 - 0.009			

h6

● 4 flute long neck end mill.

Unit : mm

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS4XLD0100N040	1	1	4	0.94	50	4	4	★	1
MS4XL**D0100N060**	1	1	6	0.94	50	4	4	★	1
MS4XL**D0100N080**	1	1	8	0.94	50	4	4	★	1
MS4XL**D0100N100**	1	1	10	0.94	50	4	4	★	1
MS4XL**D0100N120**	1	1	12	0.94	50	4	4	★	1
MS4XL**D0100N160**	1	1	16	0.94	60	4	4	★	1
MS4XL**D0110N060**	1.1	1.1	6	1.04	50	4	4	★	1
MS4XL**D0110N100**	1.1	1.1	10	1.04	50	4	4	★	1
MS4XL**D0110N160**	1.1	1.1	16	1.04	60	4	4	★	1
MS4XL**D0120N060**	1.2	1.2	6	1.14	50	4	4	★	1
MS4XL**D0120N080**	1.2	1.2	8	1.14	50	4	4	★	1
MS4XL**D0120N100**	1.2	1.2	10	1.14	50	4	4	★	1
MS4XL**D0120N120**	1.2	1.2	12	1.14	50	4	4	★	1
MS4XL**D0120N160**	1.2	1.2	16	1.14	60	4	4	★	1
MS4XL**D0130N060**	1.3	1.3	6	1.24	50	4	4	★	1
MS4XL**D0130N120**	1.3	1.3	12	1.24	50	4	4	★	1
MS4XL**D0130N180**	1.3	1.3	18	1.24	60	4	4	★	1
MS4XL**D0140N060**	1.4	1.4	6	1.34	50	4	4	★	1
MS4XL**D0140N080**	1.4	1.4	8	1.34	50	4	4	★	1
MS4XL**D0140N100**	1.4	1.4	10	1.34	50	4	4	★	1
MS4XL**D0140N120**	1.4	1.4	12	1.34	50	4	4	★	1
MS4XL**D0140N140**	1.4	1.4	14	1.34	60	4	4	★	1
MS4XL**D0140N160**	1.4	1.4	16	1.34	60	4	4	★	1
MS4XL**D0140N220**	1.4	1.4	22	1.34	60	4	4	★	1
MS4XL**D0150N060**	1.5	1.5	6	1.44	50	4	4	★	1
MS4XL**D0150N080**	1.5	1.5	8	1.44	50	4	4	★	1
MS4XL**D0150N100**	1.5	1.5	10	1.44	50	4	4	★	1
MS4XL**D0150N120**	1.5	1.5	12	1.44	50	4	4	★	1
MS4XL**D0150N140**	1.5	1.5	14	1.44	60	4	4	★	1
MS4XL**D0150N160**	1.5	1.5	16	1.44	60	4	4	★	1
MS4XL**D0150N180**	1.5	1.5	18	1.44	60	4	4	★	1

★ : Inventory maintained in Japan.

Unit : mm

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS4XLD0150N200	1.5	1.5	20	1.44	60	4	4	★	1
MS4XL**D0160N060**	1.6	1.6	6	1.54	50	4	4	★	1
MS4XL**D0160N080**	1.6	1.6	8	1.54	50	4	4	★	1
MS4XL**D0160N100**	1.6	1.6	10	1.54	50	4	4	★	1
MS4XL**D0160N120**	1.6	1.6	12	1.54	50	4	4	★	1
MS4XL**D0160N140**	1.6	1.6	14	1.54	60	4	4	★	1
MS4XL**D0160N160**	1.6	1.6	16	1.54	60	4	4	★	1
MS4XL**D0160N180**	1.6	1.6	18	1.54	60	4	4	★	1
MS4XL**D0160N200**	1.6	1.6	20	1.54	60	4	4	★	1
MS4XL**D0160N260**	1.6	1.6	26	1.54	70	4	4	★	1
MS4XL**D0170N060**	1.7	1.7	6	1.64	50	4	4	★	1
MS4XL**D0170N140**	1.7	1.7	14	1.64	60	4	4	★	1
MS4XL**D0170N240**	1.7	1.7	24	1.64	70	4	4	★	1
MS4XL**D0180N060**	1.8	1.8	6	1.74	50	4	4	★	1
MS4XL**D0180N080**	1.8	1.8	8	1.74	50	4	4	★	1
MS4XL**D0180N100**	1.8	1.8	10	1.74	50	4	4	★	1
MS4XL**D0180N120**	1.8	1.8	12	1.74	50	4	4	★	1
MS4XL**D0180N140**	1.8	1.8	14	1.74	60	4	4	★	1
MS4XL**D0180N160**	1.8	1.8	16	1.74	60	4	4	★	1
MS4XL**D0180N180**	1.8	1.8	18	1.74	60	4	4	★	1
MS4XL**D0180N200**	1.8	1.8	20	1.74	60	4	4	★	1
MS4XL**D0180N250**	1.8	1.8	25	1.74	70	4	4	★	1
MS4XL**D0190N060**	1.9	1.9	6	1.84	50	4	4	★	1
MS4XL**D0190N160**	1.9	1.9	16	1.84	60	4	4	★	1
MS4XL**D0190N280**	1.9	1.9	28	1.84	70	4	4	★	1
MS4XL**D0200N060**	2	2	6	1.9	50	4	4	★	1
MS4XL**D0200N080**	2	2	8	1.9	50	4	4	★	1
MS4XL**D0200N100**	2	2	10	1.9	50	4	4	★	1
MS4XL**D0200N120**	2	2	12	1.9	50	4	4	★	1
MS4XL**D0200N140**	2	2	14	1.9	60	4	4	★	1
MS4XL**D0200N160**	2	2	16	1.9	60	4	4	★	1
MS4XL**D0200N180**	2	2	18	1.9	60	4	4	★	1
MS4XL**D0200N200**	2	2	20	1.9	60	4	4	★	1
MS4XL**D0200N250**	2	2	25	1.9	70	4	4	★	1
MS4XL**D0200N300**	2	2	30	1.9	70	4	4	★	1
MS4XL**D0250N080**	2.5	2.5	8	2.4	50	4	4	★	1
MS4XL**D0250N120**	2.5	2.5	12	2.4	50	4	4	★	1
MS4XL**D0250N160**	2.5	2.5	16	2.4	60	4	4	★	1
MS4XL**D0250N200**	2.5	2.5	20	2.4	60	4	4	★	1
MS4XL**D0250N250**	2.5	2.5	25	2.4	70	4	4	★	1
MS4XL**D0300N080**	3	3	8	2.9	50	6	4	★	1
MS4XL**D0300N120**	3	3	12	2.9	50	6	4	★	1
MS4XL**D0300N160**	3	3	16	2.9	60	6	4	★	1
MS4XL**D0300N200**	3	3	20	2.9	60	6	4	★	1
MS4XL**D0300N250**	3	3	25	2.9	70	6	4	★	1
MS4XL**D0300N300**	3	3	30	2.9	70	6	4	★	1
MS4XL**D0350N150**	3.5	3.5	15	3.4	60	6	4	★	1
MS4XL**D0350N250**	3.5	3.5	25	3.4	70	6	4	★	1
MS4XL**D0350N350**	3.5	3.5	35	3.4	80	6	4	★	1
MS4XL**D0400N120**	4	4	12	3.9	50	6	4	★	1
MS4XL**D0400N160**	4	4	16	3.9	60	6	4	★	1

MS4XL

End mill, Short cut length, 4 flute, Long neck

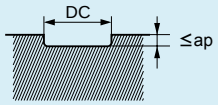
Unit : mm

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS4XLD0400N200	4	4	20	3.9	60	6	4	★	1
MS4XL**D0400N250**	4	4	25	3.9	70	6	4	★	1
MS4XL**D0400N300**	4	4	30	3.9	70	6	4	★	1
MS4XL**D0400N350**	4	4	35	3.9	80	6	4	★	1
MS4XL**D0400N400**	4	4	40	3.9	90	6	4	★	1
MS4XL**D0400N450**	4	4	45	3.9	90	6	4	★	1
MS4XL**D0400N500**	4	4	50	3.9	100	6	4	★	1
MS4XL**D0500N160**	5	5	16	4.9	60	6	4	★	1
MS4XL**D0500N250**	5	5	25	4.9	70	6	4	★	1
MS4XL**D0500N350**	5	5	35	4.9	80	6	4	★	1
MS4XL**D0500N500**	5	5	50	4.9	110	6	4	★	1
MS4XL**D0600N200**	6	6	20	5.85	80	6	4	★	2
MS4XL**D0600N300**	6	6	30	5.85	90	6	4	★	2
MS4XL**D0600N400**	6	6	40	5.85	100	6	4	★	2
MS4XL**D0600N500**	6	6	50	5.85	110	6	4	★	2
MS4XL**D0800N300**	8	8	30	7.85	90	8	4	★	2
MS4XL**D0800N500**	8	8	50	7.85	110	8	4	★	2
MS4XL**D0800N700**	8	8	70	7.85	130	8	4	★	2
MS4XL**D1000N400**	10	10	40	9.7	100	10	4	★	2
MS4XL**D1000N600**	10	10	60	9.7	120	10	4	★	2
MS4XL**D1000N800**	10	10	80	9.7	140	10	4	★	2

★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.				
DC (mm)	Neck length (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
1	4	40000	3000	118.1	0.04
	8	36000	2400	94.5	0.03
	12	20000	1000	39.4	0.02
	16	10000	500	19.7	0.005
1.2	6	40000	3000	118.1	0.05
	10	36000	2400	94.5	0.04
	12	20000	1200	47.2	0.03
	16	12000	600	23.6	0.01
1.5	6	40000	3200	126.0	0.06
	12	32000	2400	94.5	0.05
	16	16000	1100	43.3	0.03
	20	10000	600	23.6	0.01
1.8	6	40000	3600	141.7	0.08
	12	32000	2800	110.2	0.06
	20	12000	1000	39.4	0.02
	25	7000	600	23.6	0.01
2	6	40000	4000	157.5	0.1
	12	32000	3200	126.0	0.07
	16	24000	2400	94.5	0.05
	20	12000	1200	47.2	0.03
	30	5000	500	19.7	0.01
2.5	8	32000	4000	157.5	0.2
	25	9000	1100	43.3	0.04
	50	2500	300	11.8	0.005
3	8	25000	3600	141.7	0.4
	16	18000	2500	98.4	0.2
	25	12000	1700	66.9	0.1
	30	7000	800	31.5	0.05

Work material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.				
DC (mm)	Neck length (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
3.5	15	20000	3000	118.1	0.6
	25	11000	1600	63.0	0.15
	35	5500	800	31.5	0.06
4	12	18000	3000	118.1	1
	20	12000	2000	78.7	0.5
	30	8000	1300	51.2	0.2
	40	4200	700	27.6	0.08
	50	2400	400	15.7	0.03
5	16	14000	2700	106.3	1
	25	9500	1800	70.9	0.5
	35	6400	1200	47.2	0.2
	50	3200	600	23.6	0.05
6	20	11000	2200	86.6	1.2
	30	8000	1600	63.0	0.6
	40	5400	1100	43.3	0.25
	50	3200	640	25.2	0.15
8	30	8000	1600	63.0	1.6
	50	4000	800	31.5	0.5
	70	2000	400	15.7	0.2
10	40	6400	1300	51.2	2
	60	3200	640	25.2	0.6
	80	1600	320	12.6	0.3
Depth of cut					

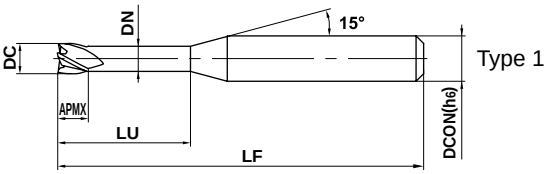
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

MS4XL – Inch sizes

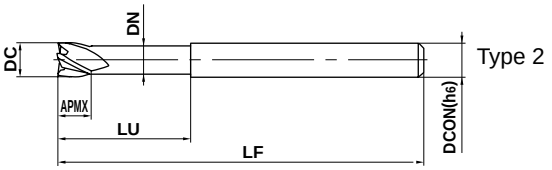
Square, 4 flute, Long neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

0 - .0008"				
DCON=.1250"	DCON=.1875"	DCON=.2500"		
0 - .00024"	0 - .00031"	0 - .00035"		

h6

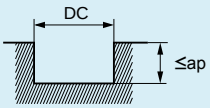
● 4 flute, long neck, square end mill for general purpose.

Unit : inch

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS4XLD1/16N0375	.0625	.0625	.3750	.0601	2.0	.1250	4	●	1
MS4XL**D1/16N0500**	.0625	.0625	.5000	.0601	2.0	.1250	4	●	1
MS4XL**D1/16N0750**	.0625	.0625	.7500	.0601	2.0	.1250	4	●	1
MS4XL**D3/32N0562**	.0938	.0938	.5625	.0898	2.0	.1250	4	●	1
MS4XL**D3/32N0750**	.0938	.0938	.7500	.0898	2.0	.1250	4	●	1
MS4XL**D3/32N1125**	.0938	.0938	1.1250	.0898	2.5	.1250	4	●	1
MS4XL**D1/8N0750**	.1250	.1250	.7500	.1211	2.0	.1250	4	●	2
MS4XL**D3/16N1125**	.1875	.1875	1.1250	.1836	2.5	.1875	4	●	2
MS4XL**D1/4N1500**	.2500	.2500	1.5000	.2441	3.0	.2500	4	●	2

● : Inventory maintained.

RECOMMENDED CUTTING CONDITIONS

Work material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.		
DC (inch)	Neck length (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)
.0156	.3750	40000	121.0	.0028
	.5000	30000	68.0	.0016
	.7500	10000	14.2	.0008
.0313	.5625	33000	109.1	.003
	.7500	20000	56.6	.002
	1.1250	10000	18.8	.001
.1250	.7500	25000	96.5	.004
.1875	1.1250	17000	72.2	.006
.2500	1.5000	13000	73.7	.008
Depth of cut				

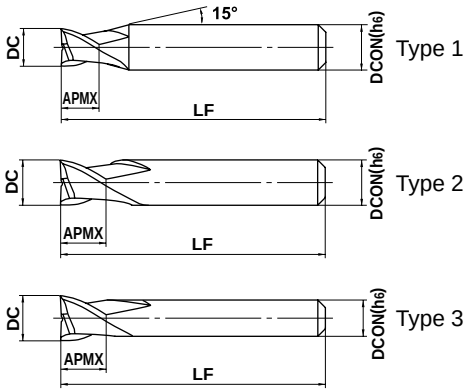
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

MS2ES

End mill, 2 flute, For Swiss type lathes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





3≤DC≤12				
0 - 0.020				
4≤DCON≤6	7≤DCON≤10			
0 - 0.008	0 - 0.009			

h6

● 2 flute end mill.

Overall length 35mm

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2ESD0300L35S04	3	3	35	4	2	●	1
MS2ES**D0350L35S04**	3.5	3.5	35	4	2	●	1
MS2ES**D0400L35S04**	4	4	35	4	2	●	2
MS2ES**D0500L35S05**	5	5	35	5	2	●	2
MS2ES**D0500L35S06**	5	5	35	6	2	●	1
MS2ES**D0600L35S05**	6	6	35	5	2	●	3
MS2ES**D0600L35S06**	6	6	35	6	2	●	2
MS2ES**D0700L35S07**	7	6	35	7	2	●	2
MS2ES**D0800L35S07**	8	6	35	7	2	●	3
MS2ES**D0800L35S08**	8	6	35	8	2	●	2
MS2ES**D1000L35S07**	10	6	35	7	2	●	3
MS2ES**D1000L35S10**	10	6	35	10	2	●	2
MS2ES**D1200L35S10**	12	6	35	10	2	●	3

Overall length 45mm

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2ESD0300L45S04	3	3	45	4	2	●	1
MS2ES**D0350L45S04**	3.5	3.5	45	4	2	●	1
MS2ES**D0400L45S04**	4	4	45	4	2	●	2
MS2ES**D0500L45S06**	5	5	45	6	2	●	1
MS2ES**D0600L45S06**	6	6	45	6	2	●	2
MS2ES**D0700L45S07**	7	7	45	7	2	●	2
MS2ES**D0800L45S07**	8	8	45	7	2	●	3
MS2ES**D0800L45S08**	8	8	45	8	2	●	2
MS2ES**D1000L45S07**	10	10	45	7	2	●	3
MS2ES**D1000L45S10**	10	10	45	10	2	●	2
MS2ES**D1200L45S10**	12	12	45	10	2	●	3

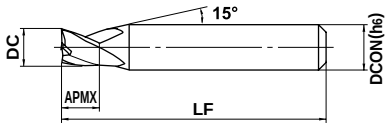
● : Inventory maintained.

MS3ES

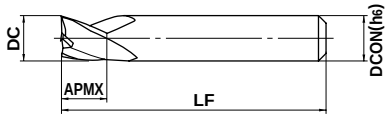
End mill, 3 flute, For Swiss type lathes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		

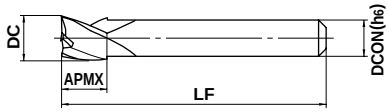




Type 1



Type 2



Type 3

3≤DC≤12				
0 - 0.020				
4≤DCON≤6	7≤DCON≤10			
0 - 0.008	0 - 0.009			

h6

● 3 flute end mill.

Overall length 35mm

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS3ESD0300L35S04	3	3	35	4	3	●	1
MS3ES**D0350L35S04**	3.5	3.5	35	4	3	●	1
MS3ES**D0400L35S04**	4	4	35	4	3	●	2
MS3ES**D0500L35S05**	5	5	35	5	3	●	2
MS3ES**D0500L35S06**	5	5	35	6	3	●	1
MS3ES**D0600L35S05**	6	6	35	5	3	●	3
MS3ES**D0600L35S06**	6	6	35	6	3	●	2
MS3ES**D0700L35S07**	7	6	35	7	3	●	2
MS3ES**D0800L35S07**	8	6	35	7	3	●	3
MS3ES**D0800L35S08**	8	6	35	8	3	●	2
MS3ES**D1000L35S07**	10	6	35	7	3	●	3
MS3ES**D1000L35S10**	10	6	35	10	3	●	2
MS3ES**D1200L35S10**	12	6	35	10	3	●	3

Overall length 45mm

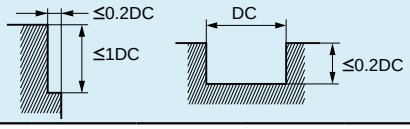
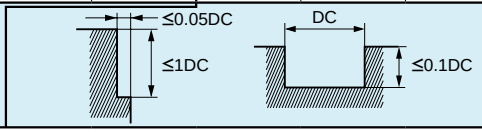
Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS3ESD0300L45S04	3	3	45	4	3	●	1
MS3ES**D0350L45S04**	3.5	3.5	45	4	3	●	1
MS3ES**D0400L45S04**	4	4	45	4	3	●	2
MS3ES**D0500L45S06**	5	5	45	6	3	●	1
MS3ES**D0600L45S06**	6	6	45	6	3	●	2
MS3ES**D0700L45S07**	7	7	45	7	3	●	2
MS3ES**D0800L45S07**	8	8	45	7	3	●	3
MS3ES**D0800L45S08**	8	8	45	8	3	●	2
MS3ES**D1000L45S07**	10	10	45	7	3	●	3
MS3ES**D1000L45S10**	10	10	45	10	3	●	2
MS3ES**D1200L45S10**	12	12	45	10	3	●	3

MS2ES
End mill, 2 flute, For Swiss type lathes

MS3ES
End mill, 3 flute, For Swiss type lathes

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45—55HRC) AISI H13 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
3	10000	600	23.6	7000	400	15.7	6000	300	11.8	5000	120	4.7
4	7500	600	23.6	5200	400	15.7	4500	300	11.8	4000	120	4.7
5	6000	600	23.6	4200	400	15.7	3600	300	11.8	3200	120	4.7
6	5000	600	23.6	3500	400	15.7	3000	300	11.8	2700	120	4.7
7	4500	560	22.0	3000	360	14.2	2700	280	11.0	2300	110	4.3
8	4000	520	20.5	2800	350	13.8	2400	260	10.2	2000	110	4.3
10	3200	450	17.7	2200	300	11.8	1900	230	9.1	1600	100	3.9
12	2700	410	16.1	1900	270	10.6	1600	210	8.3	1300	100	3.9
Depth of cut												

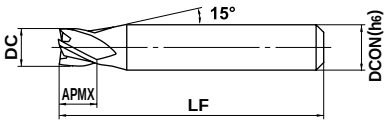
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) When drilling, please set the feed rate at 1/3 or below of the above value.
4) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MS4EC

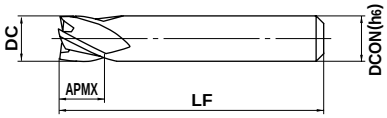
End mill, 4 flute, For Swiss type lathes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		

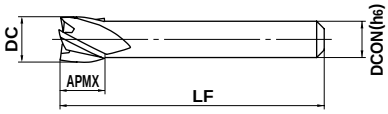




Type 1



Type 2



Type 3

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
4≤DCON≤6	7≤DCON≤10			
0 - 0.008	0 - 0.009			

●4 flute end mill.

Overall length 35mm

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4ECD0300L35S04	3	3	35	4	4	●	1
MS4EC**D0350L35S04**	3.5	3.5	35	4	4	●	1
MS4EC**D0400L35S04**	4	4	35	4	4	●	2
MS4EC**D0500L35S05**	5	5	35	5	4	●	2
MS4EC**D0500L35S06**	5	5	35	6	4	●	1
MS4EC**D0600L35S05**	6	6	35	5	4	●	3
MS4EC**D0600L35S06**	6	6	35	6	4	●	2
MS4EC**D0700L35S07**	7	6	35	7	4	●	2
MS4EC**D0800L35S07**	8	6	35	7	4	●	3
MS4EC**D0800L35S08**	8	6	35	8	4	●	2
MS4EC**D1000L35S07**	10	6	35	7	4	●	3
MS4EC**D1000L35S10**	10	6	35	10	4	●	2
MS4EC**D1200L35S10**	12	6	35	10	4	●	3

Overall length 45mm

Unit : mm

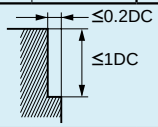
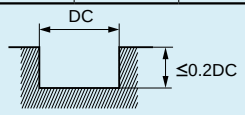
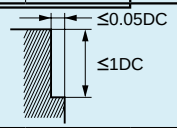
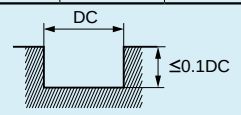
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4ECD0300L45S04	3	3	45	4	4	●	1
MS4EC**D0350L45S04**	3.5	3.5	45	4	4	●	1
MS4EC**D0400L45S04**	4	4	45	4	4	●	2
MS4EC**D0500L45S06**	5	5	45	6	4	●	1
MS4EC**D0600L45S06**	6	6	45	6	4	●	2
MS4EC**D0700L45S07**	7	7	45	7	4	●	2
MS4EC**D0800L45S07**	8	8	45	7	4	●	3
MS4EC**D0800L45S08**	8	8	45	8	4	●	2
MS4EC**D1000L45S07**	10	10	45	7	4	●	3
MS4EC**D1000L45S10**	10	10	45	10	4	●	2
MS4EC**D1200L45S10**	12	12	45	10	4	●	3
MS4EC**D1400L45S10**	14	14	45	10	4	●	3

● : Inventory maintained.

MS4EC

End mill, 4 flute, For Swiss type lathes

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45—55HRC) AISI H13 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
3	10000	900	35.4	7000	600	23.6	6000	450	17.7	5000	180	7.1
4	7500	900	35.4	5200	600	23.6	4500	450	17.7	4000	180	7.1
5	6000	900	35.4	4200	600	23.6	3600	450	17.7	3200	180	7.1
6	5000	900	35.4	3500	600	23.6	3000	450	17.7	2700	180	7.1
7	4500	840	33.1	3000	540	21.3	2700	420	16.5	2300	160	6.3
8	4000	780	30.7	2800	520	20.5	2400	390	15.4	2000	160	6.3
10	3200	680	26.8	2200	450	17.7	1900	340	13.4	1600	140	5.5
12	2700	620	24.4	1900	410	16.1	1600	310	12.2	1300	120	4.7
14	2300	550	21.7	1600	350	13.8	1400	280	11.0	1200	120	4.7
Depth of cut	 						 					

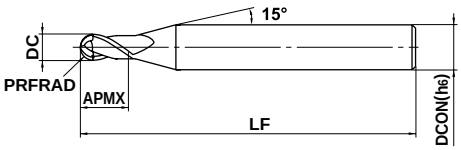
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) When drilling, please set the feed rate at 1/3 or below of the above value.
4) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MS2SB

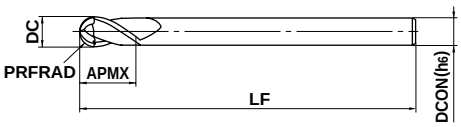
Ball nose end mill, Short cut length, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

R	0.1≤PRFRAD≤3	4≤PRFRAD≤6			
	±0.005	±0.007			
	0.2≤DC≤12				
	0 - 0.020				
h6	4≤DCON≤6	8≤DCON≤10	DCON=12		
	0 - 0.005	0 - 0.006	0 - 0.008		

● 2 flute ball nose end mill for general use.

Unit : mm

Order Number	PRFRAD	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2SBR0010S04	0.1	0.2	0.3	45	4	2	●	1
MS2SB**R0010S06**	0.1	0.2	0.3	50	6	2	●	1
MS2SB**R0015S04**	0.15	0.3	0.5	45	4	2	●	1
MS2SB**R0015S06**	0.15	0.3	0.5	50	6	2	●	1
MS2SB**R0020S04**	0.2	0.4	0.6	45	4	2	●	1
MS2SB**R0020S06**	0.2	0.4	0.6	50	6	2	●	1
MS2SB**R0025S04**	0.25	0.5	0.8	45	4	2	●	1
MS2SB**R0025S06**	0.25	0.5	0.8	50	6	2	●	1
MS2SB**R0030S04**	0.3	0.6	0.9	45	4	2	●	1
MS2SB**R0030S06**	0.3	0.6	0.9	50	6	2	●	1
MS2SB**R0035S04**	0.35	0.7	1.1	45	4	2	●	1
MS2SB**R0040S04**	0.4	0.8	1.2	45	4	2	●	1
MS2SB**R0040S06**	0.4	0.8	1.2	50	6	2	●	1
MS2SB**R0045S04**	0.45	0.9	1.4	45	4	2	●	1
MS2SB**R0050S04**	0.5	1	1.5	45	4	2	●	1
MS2SB**R0050S06**	0.5	1	1.5	50	6	2	●	1
MS2SB**R0060S04**	0.6	1.2	1.8	45	4	2	●	1
MS2SB**R0060S06**	0.6	1.2	1.8	50	6	2	●	1
MS2SB**R0070S04**	0.7	1.4	2.1	45	4	2	●	1
MS2SB**R0070S06**	0.7	1.4	2.1	50	6	2	●	1
MS2SB**R0075S04**	0.75	1.5	2.3	45	4	2	●	1
MS2SB**R0075S06**	0.75	1.5	2.3	50	6	2	●	1
MS2SB**R0080S04**	0.8	1.6	2.4	45	4	2	●	1
MS2SB**R0080S06**	0.8	1.6	2.4	50	6	2	●	1
MS2SB**R0090S04**	0.9	1.8	2.7	45	4	2	●	1
MS2SB**R0090S06**	0.9	1.8	2.7	50	6	2	●	1
MS2SB**R0100S04**	1	2	3	50	4	2	●	1
MS2SB**R0100S06**	1	2	3	50	6	2	●	1
MS2SB**R0125S04**	1.25	2.5	3.8	50	4	2	●	1
MS2SB**R0125S06**	1.25	2.5	3.8	50	6	2	●	1
MS2SB**R0150S06**	1.5	3	4.5	70	6	2	●	1

● : Inventory maintained.

MS2SB

Ball nose end mill, Short cut length, 2 flute

Order Number	PRFRAD	DC	APMXMX	LF	DCON	No. of Flutes	Stock	Type
MS2SBR0200S06	2	4	6	70	6	2	●	1
MS2SB**R0250S06**	2.5	5	7.5	80	6	2	●	1
MS2SB**R0300S06**	3	6	9	80	6	2	●	2
MS2SB**R0400S08**	4	8	12	90	8	2	●	2
MS2SB**R0500S10**	5	10	15	100	10	2	●	2
MS2SB**R0600S12**	6	12	18	110	12	2	●	2

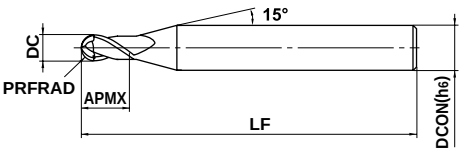
● : Inventory maintained. ★ : Inventory maintained in Japan.

MS2MB

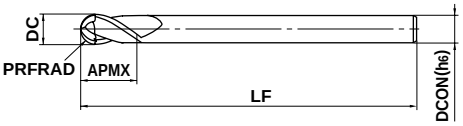
Ball nose end mill, Medium cut length, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

R	0.25≤PRFRAD≤3	4≤PRFRAD≤6			
	±0.005	±0.007			
	0.5≤DC≤12				
	0 - 0.020				
h6	4≤DCON≤6	8≤DCON≤10	DCON=12		
	0 - 0.005	0 - 0.006	0 - 0.008		

● 2 flute ball nose end mill for general use.

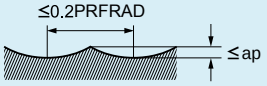
Unit : mm

Order Number	PRFRAD	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2MBR0025	0.25	0.5	1	45	4	2	●	1
MS2MB**R0030**	0.3	0.6	1.2	45	4	2	●	1
MS2MB**R0040**	0.4	0.8	1.6	45	4	2	●	1
MS2MB**R0050**	0.5	1	2.5	45	4	2	●	1
MS2MB**R0060**	0.6	1.2	2.5	45	4	2	●	1
MS2MB**R0070**	0.7	1.4	3	45	4	2	●	1
MS2MB**R0075**	0.75	1.5	4	45	4	2	●	1
MS2MB**R0080**	0.8	1.6	4	45	4	2	●	1
MS2MB**R0090**	0.9	1.8	5	45	4	2	●	1
MS2MB**R0100**	1	2	6	50	4	2	●	1
MS2MB**R0125**	1.25	2.5	6	50	4	2	●	1
MS2MB**R0150S03**	1.5	3	8	70	3	2	★	2
MS2MB**R0150**	1.5	3	8	70	6	2	●	1
MS2MB**R0175**	1.75	3.5	8	70	6	2	●	1
MS2MB**R0200S04**	2	4	8	70	4	2	★	2
MS2MB**R0200**	2	4	8	70	6	2	●	1
MS2MB**R0250**	2.5	5	12	80	6	2	●	1
MS2MB**R0300**	3	6	12	80	6	2	●	2
MS2MB**R0400**	4	8	14	90	8	2	●	2
MS2MB**R0500**	5	10	18	100	10	2	●	2
MS2MB**R0600**	6	12	22	110	12	2	●	2

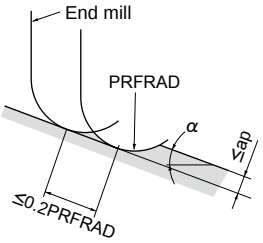
MS2SB
Ball nose end mill, Short cut length, 2 flute

MS2MB
Ball nose end mill, Medium cut length, 2 flute

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.							Hardened steel (45—55HRC) AISI H13 etc.						
PRFRAD (mm)	α≤15°			α>15°			Depth of cut ap (mm)	α≤15°			α>15°			Depth of cut ap (mm)
	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed			Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		
		(mm/min)	(IPM)		(mm/min)	(IPM)			(mm/min)	(IPM)		(mm/min)	(IPM)	
R 0.1	40000	300	11.8	40000	250	9.8	0.003	40000	300	11.8	40000	250	9.8	0.003
R 0.15	40000	500	19.7	40000	350	13.8	0.007	40000	500	19.7	40000	350	13.8	0.007
R 0.2	40000	1600	63.0	40000	1200	47.2	0.02	40000	1300	51.2	40000	950	37.4	0.015
R 0.25	40000	2400	94.5	40000	1400	55.1	0.025	40000	1900	74.8	40000	1100	43.3	0.020
R 0.3	40000	3200	126.0	40000	1600	63.0	0.03	40000	2500	98.4	40000	1300	51.2	0.025
R 0.4	40000	4800	189.0	40000	2400	94.5	0.05	40000	4000	157.5	40000	1900	74.8	0.04
R 0.5	40000	5600	220.5	40000	3200	126.0	0.06	40000	5600	220.5	40000	3000	118.1	0.05
R 0.75	40000	6500	255.9	40000	4000	157.5	0.09	40000	6500	255.9	32000	3200	126.0	0.08
R 1	40000	6500	255.9	39000	4700	185.0	0.11	40000	6500	255.9	31000	3500	137.8	0.11
R 1.25	40000	7000	275.6	33000	4500	177.2	0.12	36000	6500	255.9	26000	3500	137.8	0.12
R 1.5	40000	7500	295.3	27000	4300	169.3	0.13	32000	6000	236.2	22000	3400	133.9	0.13
R 2	32000	7500	295.3	20000	3600	141.7	0.15	25000	6000	236.2	16000	2700	106.3	0.15
R 2.5	25000	6000	236.2	16000	2900	114.2	0.20	20000	5400	212.6	13000	2300	90.6	0.20
R 3	21000	5800	228.3	13000	2600	102.4	0.25	17000	4700	185.0	10000	2000	78.7	0.25
R 4	16000	4500	177.2	10000	2000	78.7	0.30	13000	3600	141.7	8000	1500	59.1	0.30
R 5	13000	3600	141.7	8000	1700	66.9	0.50	10000	2900	114.2	6400	1200	47.2	0.50
R 6	9000	2500	98.4	6000	1300	51.2	0.50	7200	2000	78.7	4800	1000	39.4	0.50
Depth of cut														

1) α is the inclination of the machined surface.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

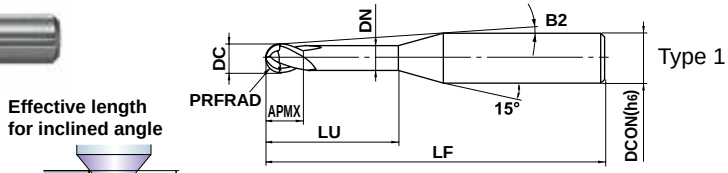


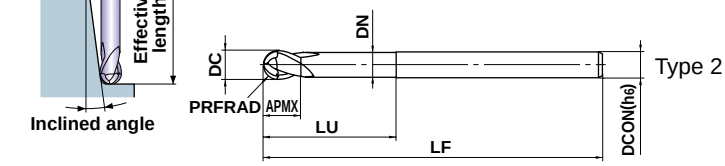
MS2XLB

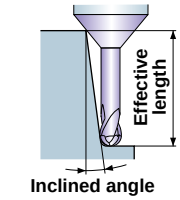
Ball nose end mill, Short cut length, 2 flute, Long neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		









R	0.1≤PRFRAD≤3		
	±0.005		
	0.2≤DC≤6		
	0 - 0.020		
h6	4≤DCON≤6		
	0 - 0.005		

● 2 flute long neck ball nose end mill.

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												30'	1°	2°	3°
MS2XLBR0010N005	0.1	0.2	0.2	0.5	0.17	14.1°	50	4	2	●	1	0.5	0.5	0.6	0.6
MS2XLB**R0010N005S06**	0.1	0.2	0.2	0.5	0.17	14.4°	50	6	2	●	1	0.5	0.5	0.6	0.6
MS2XLB**R0010N008S06**	0.1	0.2	0.2	0.8	0.17	14.1°	50	6	2	●	1	0.8	0.8	0.9	1
MS2XLB**R0010N010**	0.1	0.2	0.2	1	0.17	13.3°	50	4	2	●	1	1	1.1	1.2	1.3
MS2XLB**R0010N010S06**	0.1	0.2	0.2	1	0.17	13.8°	50	6	2	★	1	1	1.1	1.2	1.3
MS2XLB**R0010N013**	0.1	0.2	0.2	1.25	0.17	12.9°	50	4	2	★	1	1.3	1.3	1.5	1.6
MS2XLB**R0010N013S06**	0.1	0.2	0.2	1.25	0.17	13.6°	50	6	2	★	1	1.3	1.3	1.5	1.6
MS2XLB**R0010N015**	0.1	0.2	0.2	1.5	0.17	12.5°	50	4	2	●	1	1.5	1.6	1.7	1.9
MS2XLB**R0010N015S06**	0.1	0.2	0.2	1.5	0.17	13.3°	50	6	2	★	1	1.5	1.6	1.7	1.9
MS2XLB**R0010N018**	0.1	0.2	0.2	1.75	0.17	12.2°	50	4	2	★	1	1.8	1.9	2	2.2
MS2XLB**R0010N018S06**	0.1	0.2	0.2	1.75	0.17	13.1°	50	6	2	★	1	1.8	1.9	2	2.2
MS2XLB**R0010N020**	0.1	0.2	0.2	2	0.17	11.9°	50	4	2	★	1	2.1	2.2	2.3	2.5
MS2XLB**R0010N020S06**	0.1	0.2	0.2	2	0.17	12.8°	50	6	2	★	1	2.1	2.2	2.3	2.5
MS2XLB**R0010N025**	0.1	0.2	0.2	2.5	0.17	11.3°	50	4	2	★	1	2.6	2.7	2.9	3.1
MS2XLB**R0010N030**	0.1	0.2	0.2	3	0.17	10.7°	50	4	2	★	1	3.1	3.2	3.5	3.7
MS2XLB**R0015N008S06**	0.15	0.3	0.3	0.8	0.27	14.1°	50	6	2	●	1	0.8	0.8	0.9	1
MS2XLB**R0015N010**	0.15	0.3	0.3	1	0.27	13.3°	50	4	2	●	1	1	1.1	1.2	1.3
MS2XLB**R0015N010S06**	0.15	0.3	0.3	1	0.27	13.9°	50	6	2	★	1	1	1.1	1.2	1.3
MS2XLB**R0015N012S06**	0.15	0.3	0.3	1.2	0.27	13.7°	50	6	2	●	1	1.2	1.3	1.4	1.5
MS2XLB**R0015N015**	0.15	0.3	0.3	1.5	0.27	12.5°	50	4	2	★	1	1.5	1.6	1.7	1.9
MS2XLB**R0015N015S06**	0.15	0.3	0.3	1.5	0.27	13.3°	50	6	2	★	1	1.5	1.6	1.7	1.9
MS2XLB**R0015N020**	0.15	0.3	0.3	2	0.27	11.9°	50	4	2	●	1	2.1	2.2	2.3	2.5
MS2XLB**R0015N020S06**	0.15	0.3	0.3	2	0.27	12.8°	50	6	2	★	1	2.1	2.2	2.3	2.5
MS2XLB**R0015N025**	0.15	0.3	0.3	2.5	0.27	11.2°	50	4	2	★	1	2.6	2.7	2.9	3.1
MS2XLB**R0015N030**	0.15	0.3	0.3	3	0.27	10.7°	50	4	2	★	1	3.1	3.2	3.5	3.7
MS2XLB**R0015N040**	0.15	0.3	0.3	4	0.27	9.7°	50	4	2	★	1	4.2	4.3	4.6	5
MS2XLB**R0020N010**	0.2	0.4	0.4	1	0.36	13.4°	50	4	2	●	1	1	1	1.1	1.2
MS2XLB**R0020N010S06**	0.2	0.4	0.4	1	0.36	13.9°	50	6	2	★	1	1	1	1.1	1.2
MS2XLB**R0020N012S06**	0.2	0.4	0.4	1.2	0.36	13.7°	50	6	2	●	1	1.2	1.3	1.4	1.5
MS2XLB**R0020N015**	0.2	0.4	0.4	1.5	0.36	12.6°	50	4	2	★	1	1.5	1.6	1.7	1.8
MS2XLB**R0020N015S06**	0.2	0.4	0.4	1.5	0.36	13.4°	50	6	2	★	1	1.5	1.6	1.7	1.8

● : Inventory maintained. ★ : Inventory maintained in Japan.

MS2XLB

Ball nose end mill, Short cut length, 2 flute, Long neck

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												30'	1°	2°	3°
MS2XLBR0020N020	0.2	0.4	0.4	2	0.36	11.9°	50	4	2	●	1	2	2.1	2.3	2.5
MS2XLBR0020N020S06	0.2	0.4	0.4	2	0.36	12.8°	50	6	2	●	1	2	2.1	2.3	2.5
MS2XLBR0020N025	0.2	0.4	0.4	2.5	0.36	11.2°	50	4	2	★	1	2.6	2.7	2.9	3.1
MS2XLBR0020N025S06	0.2	0.4	0.4	2.5	0.36	12.4°	50	6	2	★	1	2.6	2.7	2.9	3.1
MS2XLBR0020N030	0.2	0.4	0.4	3	0.36	10.7°	50	4	2	●	1	3.1	3.2	3.4	3.7
MS2XLBR0020N030S06	0.2	0.4	0.4	3	0.36	11.9°	50	6	2	★	1	3.1	3.2	3.4	3.7
MS2XLBR0020N035	0.2	0.4	0.4	3.5	0.36	10.2°	50	4	2	★	1	3.6	3.7	4	4.3
MS2XLBR0020N040	0.2	0.4	0.4	4	0.36	9.7°	50	4	2	★	1	4.1	4.3	4.6	4.9
MS2XLBR0020N045	0.2	0.4	0.4	4.5	0.36	9.3°	50	4	2	★	1	4.7	4.8	5.2	5.6
MS2XLBR0020N050	0.2	0.4	0.4	5	0.36	8.9°	50	4	2	★	1	5.2	5.3	5.7	6.2
MS2XLBR0020N055	0.2	0.4	0.4	5.5	0.36	8.5°	50	4	2	★	1	5.7	5.9	6.3	6.8
MS2XLBR0020N060	0.2	0.4	0.4	6	0.36	8.2°	50	4	2	★	1	6.2	6.4	6.9	7.4
MS2XLBR0025N015	0.25	0.5	0.5	1.5	0.46	12.6°	50	4	2	★	1	1.5	1.6	1.7	1.8
MS2XLBR0025N015S06	0.25	0.5	0.5	1.5	0.46	13.4°	50	6	2	●	1	1.5	1.6	1.7	1.8
MS2XLBR0025N020	0.25	0.5	0.5	2	0.46	11.9°	50	4	2	●	1	2	2.1	2.3	2.4
MS2XLBR0025N020S06	0.25	0.5	0.5	2	0.46	12.9°	50	6	2	★	1	2	2.1	2.3	2.4
MS2XLBR0025N025	0.25	0.5	0.5	2.5	0.46	11.2°	50	4	2	★	1	2.6	2.7	2.9	3.1
MS2XLBR0025N025S06	0.25	0.5	0.5	2.5	0.46	12.4°	50	6	2	●	1	2.6	2.7	2.9	3.1
MS2XLBR0025N030	0.25	0.5	0.5	3	0.46	10.6°	50	4	2	★	1	3.1	3.2	3.4	3.7
MS2XLBR0025N030S06	0.25	0.5	0.5	3	0.46	11.9°	50	6	2	★	1	3.1	3.2	3.4	3.7
MS2XLBR0025N035	0.25	0.5	0.5	3.5	0.46	10.1°	50	4	2	★	1	3.6	3.7	4	4.3
MS2XLBR0025N035S06	0.25	0.5	0.5	3.5	0.46	11.5°	50	6	2	★	1	3.6	3.7	4	4.3
MS2XLBR0025N040	0.25	0.5	0.5	4	0.46	9.6°	50	4	2	●	1	4.1	4.3	4.6	4.9
MS2XLBR0025N040S06	0.25	0.5	0.5	4	0.46	11.1°	50	6	2	★	1	4.1	4.3	4.6	4.9
MS2XLBR0025N045	0.25	0.5	0.5	4.5	0.46	9.2°	50	4	2	★	1	4.6	4.8	5.2	5.6
MS2XLBR0025N045S06	0.25	0.5	0.5	4.5	0.46	10.7°	50	6	2	★	1	4.6	4.8	5.2	5.6
MS2XLBR0025N050	0.25	0.5	0.5	5	0.46	8.8°	50	4	2	★	1	5.2	5.3	5.7	6.2
MS2XLBR0025N050S06	0.25	0.5	0.5	5	0.46	10.4°	50	6	2	★	1	5.2	5.3	5.7	6.2
MS2XLBR0025N055	0.25	0.5	0.5	5.5	0.46	8.4°	50	4	2	★	1	5.7	5.9	6.3	6.8
MS2XLBR0025N055S06	0.25	0.5	0.5	5.5	0.46	10.1°	50	6	2	★	1	5.7	5.9	6.3	6.8
MS2XLBR0025N060	0.25	0.5	0.5	6	0.46	8.1°	50	4	2	●	1	6.2	6.4	6.9	7.4
MS2XLBR0025N060S06	0.25	0.5	0.5	6	0.46	9.7°	50	6	2	★	1	6.2	6.4	6.9	7.4
MS2XLBR0025N070	0.25	0.5	0.5	7	0.46	7.5°	50	4	2	★	1	7.2	7.5	8	8.7
MS2XLBR0025N070S06	0.25	0.5	0.5	7	0.46	9.2°	50	6	2	★	1	7.2	7.5	8	8.7
MS2XLBR0025N080	0.25	0.5	0.5	8	0.46	7°	50	4	2	●	1	8.3	8.5	9.2	9.9
MS2XLBR0025N080S06	0.25	0.5	0.5	8	0.46	8.7°	50	6	2	★	1	8.3	8.5	9.2	9.9
MS2XLBR0025N100	0.25	0.5	0.5	10	0.46	6.2°	50	4	2	●	1	10.3	10.7	11.5	12.4
MS2XLBR0025N100S06	0.25	0.5	0.5	10	0.46	7.8°	50	6	2	★	1	10.3	10.7	11.5	12.4
MS2XLBR0030N018S06	0.3	0.6	0.6	1.8	0.56	13°	50	6	2	●	1	1.9	1.9	2.1	2.3
MS2XLBR0030N020	0.3	0.6	0.6	2	0.56	11.8°	50	4	2	●	1	2.1	2.2	2.3	2.5
MS2XLBR0030N020S06	0.3	0.6	0.6	2	0.56	12.8°	50	6	2	★	1	2.1	2.2	2.3	2.5
MS2XLBR0030N025	0.3	0.6	0.6	2.5	0.56	11.1°	50	4	2	★	1	2.6	2.7	2.9	3.1
MS2XLBR0030N025S06	0.3	0.6	0.6	2.5	0.56	12.3°	50	6	2	★	1	2.6	2.7	2.9	3.1
MS2XLBR0030N030	0.3	0.6	0.6	3	0.56	10.5°	50	4	2	★	1	3.1	3.3	3.5	3.8
MS2XLBR0030N030S06	0.3	0.6	0.6	3	0.56	11.8°	50	6	2	●	1	3.1	3.3	3.5	3.8
MS2XLBR0030N035	0.3	0.6	0.6	3.5	0.56	10°	50	4	2	★	1	3.6	3.8	4.1	4.4
MS2XLBR0030N035S06	0.3	0.6	0.6	3.5	0.56	11.4°	50	6	2	★	1	3.6	3.8	4.1	4.4
MS2XLBR0030N040	0.3	0.6	0.6	4	0.56	9.5°	50	4	2	●	1	4.2	4.3	4.6	5
MS2XLBR0030N040S06	0.3	0.6	0.6	4	0.56	11°	50	6	2	★	1	4.2	4.3	4.6	5
MS2XLBR0030N045	0.3	0.6	0.6	4.5	0.56	9.1°	50	4	2	★	1	4.7	4.9	5.2	5.6
MS2XLBR0030N045S06	0.3	0.6	0.6	4.5	0.56	10.6°	50	6	2	★	1	4.7	4.9	5.2	5.6
MS2XLBR0030N050	0.3	0.6	0.6	5	0.56	8.7°	50	4	2	★	1	5.2	5.4	5.8	6.2

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												30'	1°	2°	3°
MS2XLBR0030N050S06	0.3	0.6	0.6	5	0.56	10.3°	50	6	2	★	1	5.2	5.4	5.8	6.2
MS2XLBR0030N060	0.3	0.6	0.6	6	0.56	8°	50	4	2	●	1	6.3	6.5	6.9	7.5
MS2XLBR0030N060S06	0.3	0.6	0.6	6	0.56	9.7°	50	6	2	★	1	6.3	6.5	6.9	7.5
MS2XLBR0030N070	0.3	0.6	0.6	7	0.56	7.4°	50	4	2	★	1	7.3	7.5	8.1	8.7
MS2XLBR0030N080	0.3	0.6	0.6	8	0.56	6.9°	50	4	2	●	1	8.3	8.6	9.2	10
MS2XLBR0030N080S06	0.3	0.6	0.6	8	0.56	8.6°	50	6	2	★	1	8.3	8.6	9.2	10
MS2XLBR0030N090	0.3	0.6	0.6	9	0.56	6.4°	50	4	2	★	1	9.4	9.7	10.4	11.2
MS2XLBR0030N100	0.3	0.6	0.6	10	0.56	6°	50	4	2	●	1	10.4	10.8	11.5	12.5
MS2XLBR0030N100S06	0.3	0.6	0.6	10	0.56	7.8°	50	6	2	★	1	10.4	10.8	11.5	12.5
MS2XLBR0030N110	0.3	0.6	0.6	11	0.56	5.7°	50	4	2	★	1	11.4	11.8	12.7	13.7
MS2XLBR0030N120	0.3	0.6	0.6	12	0.56	5.4°	50	4	2	★	1	12.5	12.9	13.8	15
MS2XLBR0040N020	0.4	0.8	0.8	2	0.76	11.7°	50	4	2	●	1	2.1	2.2	2.3	2.5
MS2XLBR0040N020S06	0.4	0.8	0.8	2	0.76	12.8°	50	6	2	★	1	2.1	2.2	2.3	2.5
MS2XLBR0040N024S06	0.4	0.8	0.8	2.4	0.76	12.4°	50	6	2	●	1	2.5	2.6	2.8	3
MS2XLBR0040N030	0.4	0.8	0.8	3	0.76	10.4°	50	4	2	★	1	3.1	3.3	3.5	3.7
MS2XLBR0040N030S06	0.4	0.8	0.8	3	0.76	11.8°	50	6	2	★	1	3.1	3.3	3.5	3.7
MS2XLBR0040N040	0.4	0.8	0.8	4	0.76	9.4°	50	4	2	●	1	4.2	4.3	4.6	5
MS2XLBR0040N040S06	0.4	0.8	0.8	4	0.76	11°	50	6	2	●	1	4.2	4.3	4.6	5
MS2XLBR0040N050	0.4	0.8	0.8	5	0.76	8.5°	50	4	2	★	1	5.2	5.4	5.8	6.2
MS2XLBR0040N060	0.4	0.8	0.8	6	0.76	7.8°	50	4	2	●	1	6.3	6.5	6.9	7.5
MS2XLBR0040N060S06	0.4	0.8	0.8	6	0.76	9.6°	50	6	2	★	1	6.3	6.5	6.9	7.5
MS2XLBR0040N070	0.4	0.8	0.8	7	0.76	7.2°	50	4	2	★	1	7.3	7.5	8.1	8.7
MS2XLBR0040N080	0.4	0.8	0.8	8	0.76	6.7°	50	4	2	●	1	8.3	8.6	9.2	10
MS2XLBR0040N080S06	0.4	0.8	0.8	8	0.76	8.5°	50	6	2	★	1	8.3	8.6	9.2	10
MS2XLBR0040N100	0.4	0.8	0.8	10	0.76	5.9°	50	4	2	●	1	10.4	10.8	11.5	12.4
MS2XLBR0040N100S06	0.4	0.8	0.8	10	0.76	7.7°	50	6	2	★	1	10.4	10.8	11.5	12.4
MS2XLBR0040N120	0.4	0.8	0.8	12	0.76	5.2°	50	4	2	★	1	12.5	12.9	13.8	14.9
MS2XLBR0050N030	0.5	1	1	3	0.94	10.1°	50	4	2	●	1	3.2	3.3	3.6	3.9
MS2XLBR0050N030S06	0.5	1	1	3	0.94	11.6°	50	6	2	●	1	3.2	3.3	3.6	3.9
MS2XLBR0050N040	0.5	1	1	4	0.94	9.1°	50	4	2	●	1	4.2	4.4	4.8	5.2
MS2XLBR0050N040S06	0.5	1	1	4	0.94	10.8°	50	6	2	★	1	4.2	4.4	4.8	5.2
MS2XLBR0050N050	0.5	1	1	5	0.94	8.2°	50	4	2	★	1	5.3	5.5	6	6.4
MS2XLBR0050N050S06	0.5	1	1	5	0.94	10.1°	50	6	2	●	1	5.3	5.5	6	6.4
MS2XLBR0050N060	0.5	1	1	6	0.94	7.5°	50	4	2	●	1	6.3	6.6	7.1	7.7
MS2XLBR0050N060S06	0.5	1	1	6	0.94	9.4°	50	6	2	★	1	6.3	6.6	7.1	7.7
MS2XLBR0050N070	0.5	1	1	7	0.94	6.9°	50	4	2	★	1	7.4	7.7	8.3	8.9
MS2XLBR0050N080	0.5	1	1	8	0.94	6.4°	50	4	2	●	1	8.4	8.8	9.4	10.2
MS2XLBR0050N080S06	0.5	1	1	8	0.94	8.3°	50	6	2	★	1	8.4	8.8	9.4	10.2
MS2XLBR0050N090	0.5	1	1	9	0.94	6°	50	4	2	★	1	9.5	9.9	10.6	11.4
MS2XLBR0050N100	0.5	1	1	10	0.94	5.6°	50	4	2	●	1	10.5	10.9	11.7	12.6
MS2XLBR0050N100S06	0.5	1	1	10	0.94	7.5°	50	6	2	★	1	10.5	10.9	11.7	12.6
MS2XLBR0050N120	0.5	1	1	12	0.94	5°	50	4	2	●	1	12.6	13.1	14	15.1
MS2XLBR0050N120S06	0.5	1	1	12	0.94	6.8°	55	6	2	★	1	12.6	13.1	14	15.1
MS2XLBR0050N140	0.5	1	1	14	0.94	4.5°	50	4	2	●	1	14.7	15.2	16.3	17.6
MS2XLBR0050N160	0.5	1	1	16	0.94	4.1°	55	4	2	●	1	16.8	17.4	18.6	20.1
MS2XLBR0050N160S06	0.5	1	1	16	0.94	5.7°	60	6	2	★	1	16.8	17.4	18.6	20.1
MS2XLBR0050N180	0.5	1	1	18	0.94	3.7°	55	4	2	●	1	18.9	19.5	20.9	22.6
MS2XLBR0050N200	0.5	1	1	20	0.94	3.4°	55	4	2	●	1	20.9	21.6	23.2	25.1
MS2XLBR0050N200S06	0.5	1	1	20	0.94	5°	60	6	2	★	1	20.9	21.6	23.2	25.1
MS2XLBR0060N036S06	0.6	1.2	1.2	3.6	1.14	11.1°	50	6	2	●	1	3.8	4	4.3	4.7
MS2XLBR0060N060	0.6	1.2	1.2	6	1.14	7.3°	50	4	2	★	1	6.3	6.6	7.1	7.6
MS2XLBR0060N060S06	0.6	1.2	1.2	6	1.14	9.3°	50	6	2	●	1	6.3	6.6	7.1	7.6

MS2XLB

Ball nose end mill, Short cut length, 2 flute, Long neck

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												30'	1°	2°	3°
MS2XLBR0060N080	0.6	1.2	1.2	8	1.14	6.2°	50	4	2	●	1	8.4	8.8	9.4	10.1
MS2XLB**R0060N080S06**	0.6	1.2	1.2	8	1.14	8.2°	50	6	2	★	1	8.4	8.8	9.4	10.1
MS2XLB**R0060N100**	0.6	1.2	1.2	10	1.14	5.4°	50	4	2	★	1	10.5	10.9	11.7	12.6
MS2XLB**R0060N100S06**	0.6	1.2	1.2	10	1.14	7.4°	50	6	2	★	1	10.5	10.9	11.7	12.6
MS2XLB**R0060N120**	0.6	1.2	1.2	12	1.14	4.8°	50	4	2	●	1	12.6	13.1	14	15.1
MS2XLB**R0060N120S06**	0.6	1.2	1.2	12	1.14	6.7°	55	6	2	★	1	12.6	13.1	14	15.1
MS2XLB**R0060N140**	0.6	1.2	1.2	14	1.14	4.3°	50	4	2	★	1	14.7	15.2	16.3	17.6
MS2XLB**R0060N160**	0.6	1.2	1.2	16	1.14	3.9°	55	4	2	★	1	16.8	17.3	18.6	20.1
MS2XLB**R0060N160S06**	0.6	1.2	1.2	16	1.14	5.6°	60	6	2	★	1	16.8	17.3	18.6	20.1
MS2XLB**R0060N180**	0.6	1.2	1.2	18	1.14	3.5°	55	4	2	★	1	18.8	19.5	20.9	22.6
MS2XLB**R0060N240**	0.6	1.2	1.2	24	1.14	2.8°	65	4	2	★	1	25.1	25.9	27.8	*
MS2XLB**R0070N080**	0.7	1.4	1.4	8	1.34	6°	50	4	2	●	1	8.4	8.8	9.4	10.1
MS2XLB**R0070N120**	0.7	1.4	1.4	12	1.34	4.6°	50	4	2	●	1	12.6	13.1	14	15.1
MS2XLB**R0070N160**	0.7	1.4	1.4	16	1.34	3.7°	55	4	2	●	1	16.8	17.3	18.6	20.1
MS2XLB**R0075N045S06**	0.75	1.5	1.5	4.5	1.44	10.2°	50	6	2	●	1	4.7	5	5.4	5.7
MS2XLB**R0075N060**	0.75	1.5	1.5	6	1.44	7°	50	4	2	●	1	6.3	6.6	7.1	7.6
MS2XLB**R0075N060S06**	0.75	1.5	1.5	6	1.44	9.2°	50	6	2	★	1	6.3	6.6	7.1	7.6
MS2XLB**R0075N075S06**	0.75	1.5	1.5	7.5	1.44	8.3°	50	6	2	●	1	7.9	8.2	8.8	9.5
MS2XLB**R0075N080**	0.75	1.5	1.5	8	1.44	5.9°	50	4	2	●	1	8.4	8.8	9.4	10.1
MS2XLB**R0075N080S06**	0.75	1.5	1.5	8	1.44	8.1°	50	6	2	★	1	8.4	8.8	9.4	10.1
MS2XLB**R0075N100**	0.75	1.5	1.5	10	1.44	5.1°	50	4	2	●	1	10.5	10.9	11.7	12.6
MS2XLB**R0075N100S06**	0.75	1.5	1.5	10	1.44	7.2°	50	6	2	★	1	10.5	10.9	11.7	12.6
MS2XLB**R0075N120**	0.75	1.5	1.5	12	1.44	4.4°	50	4	2	●	1	12.6	13.1	14	15.1
MS2XLB**R0075N120S06**	0.75	1.5	1.5	12	1.44	6.5°	55	6	2	★	1	12.6	13.1	14	15.1
MS2XLB**R0075N140**	0.75	1.5	1.5	14	1.44	4°	50	4	2	●	1	14.7	15.2	16.3	17.6
MS2XLB**R0075N140S06**	0.75	1.5	1.5	14	1.44	5.9°	55	6	2	★	1	14.7	15.2	16.3	17.6
MS2XLB**R0075N160**	0.75	1.5	1.5	16	1.44	3.6°	55	4	2	●	1	16.8	17.3	18.6	20
MS2XLB**R0075N160S06**	0.75	1.5	1.5	16	1.44	5.4°	60	6	2	★	1	16.8	17.3	18.6	20
MS2XLB**R0075N180**	0.75	1.5	1.5	18	1.44	3.3°	55	4	2	●	1	18.8	19.5	20.9	22.5
MS2XLB**R0075N200**	0.75	1.5	1.5	20	1.44	3°	55	4	2	●	1	20.9	21.6	23.2	*
MS2XLB**R0075N200S06**	0.75	1.5	1.5	20	1.44	4.6°	60	6	2	★	1	20.9	21.6	23.2	25
MS2XLB**R0075N220**	0.75	1.5	1.5	22	1.44	2.8°	60	4	2	★	1	23	23.8	25.5	*
MS2XLB**R0075N300**	0.75	1.5	1.5	30	1.44	2.1°	70	4	2	★	1	31.2	32.3	34.7	*
MS2XLB**R0080N080**	0.8	1.6	1.6	8	1.54	5.8°	50	4	2	●	1	8.4	8.8	9.4	10.1
MS2XLB**R0080N120**	0.8	1.6	1.6	12	1.54	4.3°	50	4	2	●	1	12.6	13.1	14	15.1
MS2XLB**R0080N160**	0.8	1.6	1.6	16	1.54	3.5°	55	4	2	●	1	16.8	17.3	18.6	20
MS2XLB**R0080N200**	0.8	1.6	1.6	20	1.54	2.9°	55	4	2	●	1	20.9	21.6	23.2	*
MS2XLB**R0090N080**	0.9	1.8	1.8	8	1.74	5.5°	50	4	2	●	1	8.4	8.8	9.4	10.1
MS2XLB**R0090N120**	0.9	1.8	1.8	12	1.74	4.1°	50	4	2	●	1	12.6	13	14	15
MS2XLB**R0090N160**	0.9	1.8	1.8	16	1.74	3.3°	55	4	2	●	1	16.8	17.3	18.6	20
MS2XLB**R0090N200**	0.9	1.8	1.8	20	1.74	2.7°	55	4	2	●	1	20.9	21.6	23.2	*
MS2XLB**R0100N040**	1	2	2	4	1.9	8.2°	50	4	2	●	1	4.1	4.3	4.6	4.9
MS2XLB**R0100N040S06**	1	2	2	4	1.9	10.6°	50	6	2	★	1	4.1	4.3	4.6	4.9
MS2XLB**R0100N060**	1	2	2	6	1.9	6.4°	50	4	2	●	1	6.2	6.5	6.9	7.4
MS2XLB**R0100N060S06**	1	2	2	6	1.9	9°	50	6	2	●	1	6.2	6.5	6.9	7.4
MS2XLB**R0100N080**	1	2	2	8	1.9	5.3°	50	4	2	●	1	8.3	8.7	9.2	9.9
MS2XLB**R0100N080S06**	1	2	2	8	1.9	7.8°	50	6	2	★	1	8.3	8.7	9.2	9.9
MS2XLB**R0100N100**	1	2	2	10	1.9	4.5°	50	4	2	●	1	10.4	10.8	11.5	12.4
MS2XLB**R0100N100S06**	1	2	2	10	1.9	6.9°	50	6	2	●	1	10.4	10.8	11.5	12.4
MS2XLB**R0100N120**	1	2	2	12	1.9	3.9°	50	4	2	●	1	12.5	12.9	13.8	14.9
MS2XLB**R0100N120S06**	1	2	2	12	1.9	6.1°	55	6	2	★	1	12.5	12.9	13.8	14.9
MS2XLB**R0100N140**	1	2	2	14	1.9	3.4°	50	4	2	●	1	14.6	15.1	16.1	17.4

* No interference

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												30'	1°	2°	3°
MS2XLBR0100N140S06	1	2	2	14	1.9	5.6°	55	6	2	★	1	14.6	15.1	16.1	17.4
MS2XLBR0100N160	1	2	2	16	1.9	3.1°	55	4	2	●	1	16.7	17.2	18.4	19.9
MS2XLBR0100N160S06	1	2	2	16	1.9	5.1°	60	6	2	★	1	16.7	17.2	18.4	19.9
MS2XLBR0100N180	1	2	2	18	1.9	2.8°	55	4	2	●	1	18.7	19.4	20.7	⁎
MS2XLBR0100N180S06	1	2	2	18	1.9	4.7°	60	6	2	★	1	18.7	19.4	20.7	22.3
MS2XLBR0100N200	1	2	2	20	1.9	2.5°	60	4	2	●	1	20.8	21.5	23	⁎
MS2XLBR0100N200S06	1	2	2	20	1.9	4.3°	60	6	2	★	1	20.8	21.5	23	24.8
MS2XLBR0100N220	1	2	2	22	1.9	2.3°	60	4	2	●	1	22.9	23.6	25.3	⁎
MS2XLBR0100N250	1	2	2	25	1.9	2.1°	65	4	2	●	1	26	26.8	28.8	⁎
MS2XLBR0100N250S06	1	2	2	25	1.9	3.7°	65	6	2	★	1	26	26.8	28.8	31
MS2XLBR0100N300	1	2	2	30	1.9	1.8°	70	4	2	●	1	31.1	32.2	⁎	⁎
MS2XLBR0100N300S06	1	2	2	30	1.9	3.2°	70	6	2	★	1	31.1	32.2	34.5	37.3
MS2XLBR0100N350	1	2	2	35	1.9	1.6°	70	4	2	★	1	36.3	37.5	⁎	⁎
MS2XLBR0100N350S06	1	2	2	35	1.9	2.8°	80	6	2	★	1	36.3	37.5	40.3	⁎
MS2XLBR0125N060S06	1.25	2.5	2.5	6	2.4	8.6°	50	6	2	★	1	6.2	6.5	6.9	7.4
MS2XLBR0125N075S06	1.25	2.5	2.5	7.5	2.4	7.7°	50	6	2	●	1	7.8	8.1	8.6	9.2
MS2XLBR0125N100S06	1.25	2.5	2.5	10	2.4	6.5°	50	6	2	★	1	10.4	10.8	11.5	12.3
MS2XLBR0125N125S06	1.25	2.5	2.5	12.5	2.4	5.6°	50	6	2	●	1	13	13.5	14.4	15.4
MS2XLBR0125N160S06	1.25	2.5	2.5	16	2.4	4.7°	60	6	2	★	1	16.7	17.2	18.4	19.8
MS2XLBR0125N200S06	1.25	2.5	2.5	20	2.4	4°	60	6	2	★	1	20.8	21.5	23	24.8
MS2XLBR0125N250S06	1.25	2.5	2.5	25	2.4	3.3°	65	6	2	★	1	26	26.8	28.7	31
MS2XLBR0125N300S06	1.25	2.5	2.5	30	2.4	2.9°	70	6	2	★	1	31.1	32.2	34.5	⁎
MS2XLBR0125N350S06	1.25	2.5	2.5	35	2.4	2.5°	80	6	2	★	1	36.3	37.5	40.2	⁎
MS2XLBR0150N080	1.5	3	3	8	2.9	7°	60	6	2	●	1	8.3	8.6	9.2	9.8
MS2XLBR0150N100	1.5	3	3	10	2.9	6°	60	6	2	●	1	10.4	10.8	11.5	12.3
MS2XLBR0150N120	1.5	3	3	12	2.9	5.3°	60	6	2	●	1	12.5	12.9	13.8	14.8
MS2XLBR0150N140	1.5	3	3	14	2.9	4.7°	60	6	2	★	1	14.6	15	16.1	17.3
MS2XLBR0150N160	1.5	3	3	16	2.9	4.3°	60	6	2	●	1	16.6	17.2	18.4	19.7
MS2XLBR0150N200	1.5	3	3	20	2.9	3.6°	70	6	2	●	1	20.8	21.5	23	24.7
MS2XLBR0150N250	1.5	3	3	25	2.9	3°	70	6	2	●	1	26	26.8	28.7	⁎
MS2XLBR0150N300	1.5	3	3	30	2.9	2.6°	70	6	2	●	1	31.1	32.2	34.5	⁎
MS2XLBR0150N350	1.5	3	3	35	2.9	2.2°	80	6	2	●	1	36.3	37.5	40.2	⁎
MS2XLBR0150N400	1.5	3	3	40	2.9	2°	90	6	2	★	1	41.5	42.9	⁎	⁎
MS2XLBR0200N100	2	4	4	10	3.9	4.8°	70	6	2	●	1	10.4	10.7	11.4	12.2
MS2XLBR0200N120	2	4	4	12	3.9	4.1°	70	6	2	●	1	12.5	12.9	13.7	14.6
MS2XLBR0200N140	2	4	4	14	3.9	3.6°	70	6	2	★	1	14.6	15	16	17.1
MS2XLBR0200N160	2	4	4	16	3.9	3.2°	70	6	2	●	1	16.6	17.1	18.3	19.6
MS2XLBR0200N200	2	4	4	20	3.9	2.7°	70	6	2	●	1	20.8	21.4	22.9	⁎
MS2XLBR0200N250	2	4	4	25	3.9	2.2°	70	6	2	●	1	25.9	26.8	28.6	⁎
MS2XLBR0200N300	2	4	4	30	3.9	1.8°	70	6	2	●	1	31.1	32.1	⁎	⁎
MS2XLBR0200N350	2	4	4	35	3.9	1.6°	80	6	2	●	1	36.3	37.5	⁎	⁎
MS2XLBR0200N400	2	4	4	40	3.9	1.4°	90	6	2	●	1	41.4	42.8	⁎	⁎
MS2XLBR0200N450	2	4	4	45	3.9	1.3°	90	6	2	●	1	46.6	48.2	⁎	⁎
MS2XLBR0200N500	2	4	4	50	3.9	1.2°	100	6	2	●	1	51.8	53.5	⁎	⁎
MS2XLBR0250N200	2.5	5	5	20	4.9	1.5°	70	6	2	●	1	20.7	21.4	⁎	⁎
MS2XLBR0250N250	2.5	5	5	25	4.9	1.2°	70	6	2	●	1	25.9	26.7	⁎	⁎
MS2XLBR0250N300	2.5	5	5	30	4.9	1°	80	6	2	●	1	31.1	⁎	⁎	⁎
MS2XLBR0250N350	2.5	5	5	35	4.9	0.9°	80	6	2	●	1	36.3	⁎	⁎	⁎
MS2XLBR0300N300	3	6	6	30	5.85	—	80	6	2	●	2	⁎	⁎	⁎	⁎
MS2XLBR0300N500	3	6	6	50	5.85	—	120	6	2	●	2	⁎	⁎	⁎	⁎

⁎ No interference

MS2XLB

Ball nose end mill, Short cut length, 2 flute, Long neck

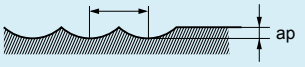
RECOMMENDED CUTTING CONDITIONS

Work material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.				Hardened steel (45—55HRC) AISI H13 etc.			
PRFRAD (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
R 0.1	0.5	50000	400	15.7	0.003	50000	320	12.6	0.003
	1	50000	400	15.7	0.002	50000	320	12.6	0.002
	1.5	40000	300	11.8	0.001	40000	240	9.4	0.001
	2	40000	200	7.9	0.001	40000	160	6.3	0.001
	2.5	40000	100	3.9	0.001	40000	80	3.1	0.001
	3	30000	50	2.0	0.001	30000	40	1.6	0.001
R 0.15	1	50000	600	23.6	0.007	50000	480	18.9	0.007
	1.5	50000	600	23.6	0.005	50000	480	18.9	0.005
	2	50000	600	23.6	0.003	50000	480	18.9	0.003
	2.5	40000	400	15.7	0.003	40000	320	12.6	0.003
	3	40000	300	11.8	0.002	40000	240	9.4	0.002
	4	30000	200	7.9	0.002	30000	160	6.3	0.002
R 0.2	1	50000	1800	70.9	0.015	50000	1400	55.1	0.015
	2	50000	1300	51.2	0.01	50000	1000	39.4	0.01
	3	50000	900	35.4	0.005	50000	700	27.6	0.005
	4	40000	600	23.6	0.004	40000	480	18.9	0.004
	5	40000	400	15.7	0.003	40000	320	12.6	0.003
	6	30000	200	7.9	0.002	30000	160	6.3	0.002
R 0.25	2	50000	2500	98.4	0.02	50000	2000	78.7	0.02
	3	50000	1500	59.1	0.015	50000	1200	47.2	0.015
	4	45000	1200	47.2	0.01	45000	950	37.4	0.01
	5	45000	900	35.4	0.007	45000	700	27.6	0.007
	6	36000	600	23.6	0.006	36000	480	18.9	0.006
	7	32000	400	15.7	0.005	32000	320	12.6	0.005
	8	32000	300	11.8	0.003	32000	240	9.4	0.003
	10	26000	200	7.9	0.002	26000	160	6.3	0.002
R 0.3	2	50000	3500	137.8	0.03	50000	2800	110.2	0.03
	3	50000	3500	137.8	0.03	50000	2800	110.2	0.03
	4	44000	2500	98.4	0.02	44000	2000	78.7	0.02
	5	37000	1200	47.2	0.01	37000	950	37.4	0.01
	6	37000	1000	39.4	0.008	37000	800	31.5	0.008
	7	35000	750	29.5	0.008	35000	600	23.6	0.008
	8	35000	600	23.6	0.006	35000	480	18.9	0.006
	9	30000	500	19.7	0.004	30000	400	15.7	0.004
	10	30000	500	19.7	0.003	30000	400	15.7	0.003
	11	22000	300	11.8	0.002	22000	240	9.4	0.002
	12	22000	200	7.9	0.002	22000	160	6.3	0.002
R 0.4	2	50000	4400	173.2	0.04	50000	3500	137.8	0.04
	3	50000	4000	157.5	0.04	50000	3200	126.0	0.04
	4	50000	4000	157.5	0.02	50000	3200	126.0	0.02
	5	35000	2400	94.5	0.02	35000	1900	74.8	0.02
	6	35000	2400	94.5	0.02	35000	1900	74.8	0.02
	7	30000	1500	59.1	0.015	30000	1200	47.2	0.015
	8	30000	1500	59.1	0.01	30000	1200	47.2	0.01
	10	30000	700	27.6	0.008	30000	560	22.0	0.008
	12	22000	500	19.7	0.006	22000	400	15.7	0.006
R 0.5	3	40000	4000	157.5	0.05	44000	3200	126.0	0.05
	4	40000	4000	157.5	0.05	44000	3200	126.0	0.05
	6	35000	3000	118.1	0.03	35000	2400	94.5	0.03
	8	30000	2000	78.7	0.02	30000	1600	63.0	0.02

Work material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.				Hardened steel (45—55HRC) AISI H13 etc.			
PRFRAD (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
R 0.5	10	20000	1000	39.4	0.01	20000	800	31.5	0.01
	12	20000	1000	39.4	0.01	20000	800	31.5	0.01
	14	18000	600	23.6	0.008	18000	480	18.9	0.008
	16	18000	500	19.7	0.008	18000	400	15.7	0.008
	18	13000	300	11.8	0.005	13000	240	9.4	0.005
	20	13000	250	9.8	0.005	13000	200	7.9	0.005
R 0.6	3.6	40000	4400	173.2	0.06	40000	3500	137.8	0.06
	6	40000	4400	173.2	0.04	40000	3500	137.8	0.04
	8	40000	4000	157.5	0.04	40000	3200	126.0	0.04
	10	27000	1900	74.8	0.02	27000	1500	59.1	0.02
	12	16000	1400	55.1	0.02	16000	1100	43.3	0.02
	18	15000	700	27.6	0.008	15000	560	22.0	0.008
	24	11000	300	11.8	0.006	11000	240	9.4	0.006
R 0.75	6	40000	6000	236.2	0.07	36000	4300	169.3	0.07
	8	40000	6000	236.2	0.07	36000	4300	169.3	0.07
	10	40000	5000	196.9	0.06	36000	3600	141.7	0.06
	12	32000	3400	133.9	0.04	29000	2400	94.5	0.04
	16	15000	1400	55.1	0.03	15000	1100	43.3	0.03
	20	12000	900	35.4	0.02	12000	720	28.3	0.02
	30	9000	400	15.7	0.01	9000	320	12.6	0.01
R 1	4	40000	8000	315.0	0.1	32000	5000	196.9	0.1
	6	40000	8000	315.0	0.1	32000	5000	196.9	0.1
	8	40000	6000	236.2	0.1	32000	3800	149.6	0.1
	10	40000	5000	196.9	0.08	32000	3200	126.0	0.08
	12	40000	5000	196.9	0.08	32000	3200	126.0	0.08
	16	32000	3500	137.8	0.05	26000	2200	86.6	0.05
	20	10000	1000	39.4	0.04	10000	800	31.5	0.04
	25	10000	1000	39.4	0.04	10000	800	31.5	0.04
	30	10000	800	31.5	0.02	10000	640	25.2	0.02
	35	10000	600	23.6	0.02	10000	480	18.9	0.02
R 1.5	8	32000	7000	275.6	0.15	26000	4500	177.2	0.15
	10	32000	7000	275.6	0.15	26000	4500	177.2	0.15
	16	32000	5000	196.9	0.1	26000	3200	126.0	0.1
	20	27000	3800	149.6	0.1	22000	2400	94.5	0.1
	25	21000	2700	106.3	0.08	17000	1700	66.9	0.08
	30	6000	700	27.6	0.08	6000	560	22.0	0.08
	35	6000	700	27.6	0.06	6000	560	22.0	0.06
	40	6000	600	23.6	0.04	6000	480	18.9	0.04
R 2	10	24000	6000	236.2	0.2	19000	3800	149.6	0.2
	20	24000	3800	149.6	0.15	19000	2400	94.5	0.15
	30	20000	3000	118.1	0.1	16000	1900	74.8	0.1
	40	12000	1700	66.9	0.1	12000	1400	55.1	0.1
	50	8000	1000	39.4	0.05	8000	800	31.5	0.05
R 2.5	20	22000	6000	236.2	0.2	18000	3800	149.6	0.2
	25	22000	4400	173.2	0.2	18000	2800	110.2	0.2
	30	22000	3800	149.6	0.15	18000	2400	94.5	0.15
	35	22000	3600	141.7	0.1	18000	2300	90.6	0.1
R 3	30	20000	6000	236.2	0.2	16000	3800	149.6	0.2
	50	20000	3000	118.1	0.15	16000	1900	74.8	0.15

Depth of cut

≤0.1PRFRAD (PRFRAD≤1)
≤0.2PRFRAD (PRFRAD> 1)



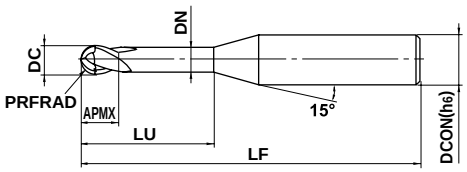
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

MS2XLB – Inch sizes

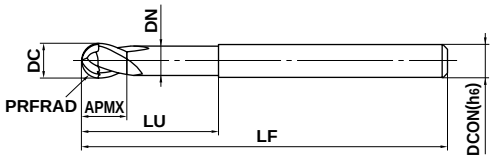
Ball nose, 2 flute, Long neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool steel, Pre-Hardened Steel (≤45HRC)	Hardened steel (≤55HRC)	Hardened steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

R	.0078"≤PRFRAD≤.1250"				
	±.0004"				
	.0156"≤DC≤.2500"				
	0 - .0008"				
h6	DCON=.1250"	DCON=.1875"	DCON=.2500"		
	0 - .00024"	0 - .00031"	0 - .00035"		

●2 flute, long neck, ball nose end mill for general purpose.

Unit : inch

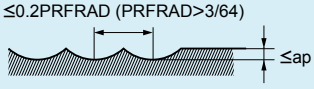
Order Number	PRFRAD	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XLBD1/64N0094	.00781	.0156	.01563	.0938	.0144	2.0	.1250	2	●	1
MS2XLB**D1/64N0125**	.00781	.0156	.01563	.1250	.0144	2.0	.1250	2	●	1
MS2XLB**D1/64N0187**	.00781	.0156	.01563	.1875	.0144	2.0	.1250	2	●	1
MS2XLB**D1/32N0187**	.01563	.0313	.03125	.1875	.0301	2.0	.1250	2	●	1
MS2XLB**D1/32N0250**	.01563	.0313	.03125	.2500	.0301	2.0	.1250	2	●	1
MS2XLB**D1/32N0375**	.01563	.0313	.03125	.3750	.0301	2.0	.1250	2	●	1
MS2XLB**D1/16N0375**	.03125	.0625	.0625	.3750	.0601	2.0	.1250	2	●	1
MS2XLB**D1/16N0500**	.03125	.0625	.0625	.5000	.0601	2.0	.1250	2	●	1
MS2XLB**D1/16N0750**	.03125	.0625	.0625	.7500	.0601	2.0	.1250	2	●	1
MS2XLB**D3/32N0562**	.04688	.0938	.09375	.5625	.0898	2.0	.1250	2	●	1
MS2XLB**D3/32N0750**	.04688	.0938	.09375	.7500	.0898	2.0	.1250	2	●	1
MS2XLB**D3/32N1125**	.04688	.0938	.09375	1.1250	.0898	2.5	.1250	2	●	1
MS2XLB**D1/8N0750**	.06250	.1250	.1250	.7500	.1211	2.0	.1250	2	●	2
MS2XLB**D3/16N1125**	.09375	.1875	.1875	1.1250	.1836	2.5	.1875	2	●	2
MS2XLB**D1/4N1500**	.12500	.2500	.2500	1.5000	.2441	3.0	.2500	2	●	2

● : Inventory maintained.

MS2XLB – Inch sizes

Ball nose, 2 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

Work material	Hardened steel (45—55HRC) AISI H13 etc.			
PRFRAD (inch)	**LU** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)
.0078	.0938	40000	21.2	.0002
	.1290	30000	17.7	.0002
	.1875	20000	10.6	.0001
.0156	.1875	40000	70.8	.0008
	.2500	25000	44.3	.0008
	.3750	15000	26.6	.0004
.0313	.3750	40000	113.4	.0028
	.5000	30000	85.1	.0016
	.7500	10000	28.4	.0008
.0469	.5625	40000	141.8	.003
	.7500	20000	70.8	.002
	1.1250	10000	35.5	.001
.0625	.7500	30000	124.0	.004
.0938	1.1250	20000	106.3	.006
.1250	1.5000	15000	106.3	.008
Depth of cut	≤0.1PRFRAD (PRFRAD≤3/64) ≤0.2PRFRAD (PRFRAD>3/64) 			

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

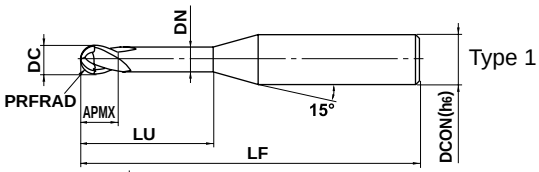
MS4XLB – Inch sizes

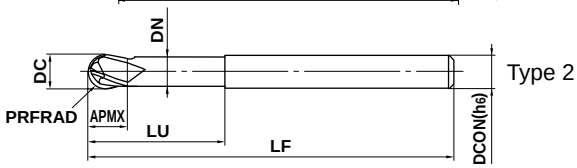
Ball nose, 4 flute, Long neck

DC<3/16 DC=1/4

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		







R				
	±.0004"			
	0 - .0008"			
h6	DCON=.1250"	DCON=.1875"	DCON=.2500"	
	0 - .00024"	0 - .00031"	0 - .00035"	

● 4 flute, long neck, ball nose end mill for general purpose.

Unit : inch

Order Number	PRFRAD	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS4XLBD1/16N0375	.03125	.0625	.0625	.3750	.0601	2.0	.1250	4	●	1
MS4XLBD1/16N0500	.03125	.0625	.0625	.5000	.0601	2.0	.1250	4	●	1
MS4XLBD1/16N0750	.03125	.0625	.0625	.7500	.0601	2.0	.1250	4	●	1
MS4XLBD3/32N0562	.04688	.0938	.0938	.5625	.0898	2.0	.1250	4	●	1
MS4XLBD3/32N0750	.04688	.0938	.0938	.7500	.0898	2.0	.1250	4	●	1
MS4XLBD3/32N1125	.04688	.0938	.0938	1.1250	.0898	2.5	.1250	4	●	1
MS4XLBD1/8N0750	.06250	.1250	.1250	.7500	.1211	2.0	.1250	4	●	2
MS4XLBD3/16N1125	.09375	.1875	.1875	1.1250	.1836	2.5	.1875	4	●	2
MS4XLBD1/4N1500	.1250	.2500	.2500	1.5000	.2441	3.0	.2500	4	●	2

RECOMMENDED CUTTING CONDITIONS

Work material	Hardened steel (45—55HRC) AISI H13 etc.		
PRFRAD (inch) / LU (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)
.0313 / .3750	40000	151.2	.0028
.0313 / .5000	30000	113.4	.0016
.0313 / .7500	10000	37.8	.0008
.0156 / .5625	40000	189.0	.003
.0156 / .7500	20000	94.4	.002
.0156 / 1.1250	10000	47.3	.001
.0625 / .7500	30000	165.4	.004
.0938 / 1.1250	20000	141.7	.006
.1250 / 1.5000	15000	141.7	.008
Depth of cut	≤0.1PRFRAD (PRFRAD≤3/64) ≤0.2PRFRAD (PRFRAD>3/64) ≤ap		

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

● : Inventory maintained.

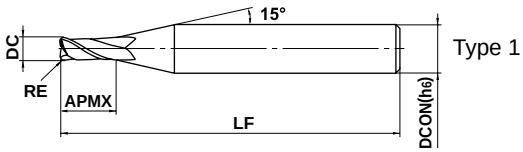
MS2MRB

Corner radius end mill, Medium cut length, 2 flute

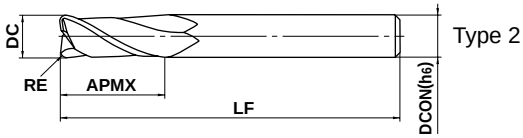
UWC MS 30° DC<3 DC≥3

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

1≤DC≤12				
0 - 0.020				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

h6

● 2 flute corner radius end mill for general use.

Unit : mm

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2MRBD0100R010	1	0.1	2	40	4	2	★	1
MS2MRB**D0100R020**	1	0.2	2	40	4	2	●	1
MS2MRB**D0100R030**	1	0.3	2	40	4	2	●	1
MS2MRB**D0150R010**	1.5	0.1	3	40	4	2	★	1
MS2MRB**D0150R020**	1.5	0.2	3	40	4	2	●	1
MS2MRB**D0150R030**	1.5	0.3	3	40	4	2	●	1
MS2MRB**D0150R050**	1.5	0.5	3	40	4	2	●	1
MS2MRB**D0200R010**	2	0.1	4	40	4	2	★	1
MS2MRB**D0200R020**	2	0.2	4	40	4	2	●	1
MS2MRB**D0200R030**	2	0.3	4	40	4	2	●	1
MS2MRB**D0200R050**	2	0.5	4	40	4	2	●	1
MS2MRB**D0250R010**	2.5	0.1	5	40	4	2	★	1
MS2MRB**D0250R020**	2.5	0.2	5	40	4	2	●	1
MS2MRB**D0250R030**	2.5	0.3	5	40	4	2	●	1
MS2MRB**D0250R050**	2.5	0.5	5	40	4	2	●	1
MS2MRB**D0300R010**	3	0.1	6	50	6	2	★	1
MS2MRB**D0300R020**	3	0.2	6	50	6	2	●	1
MS2MRB**D0300R030**	3	0.3	6	50	6	2	●	1
MS2MRB**D0300R050**	3	0.5	6	50	6	2	●	1
MS2MRB**D0300R100**	3	1	6	50	6	2	●	1
MS2MRB**D0400R010**	4	0.1	8	50	6	2	★	1
MS2MRB**D0400R020**	4	0.2	8	50	6	2	●	1
MS2MRB**D0400R030**	4	0.3	8	50	6	2	●	1
MS2MRB**D0400R050**	4	0.5	8	50	6	2	●	1
MS2MRB**D0400R100**	4	1	8	50	6	2	●	1
MS2MRB**D0500R010**	5	0.1	10	50	6	2	★	1
MS2MRB**D0500R020**	5	0.2	10	50	6	2	●	1
MS2MRB**D0500R030**	5	0.3	10	50	6	2	●	1
MS2MRB**D0500R050**	5	0.5	10	50	6	2	●	1
MS2MRB**D0500R100**	5	1	10	50	6	2	●	1
MS2MRB**D0600R010**	6	0.1	12	50	6	2	★	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

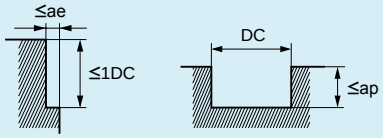
Unit : mm

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2MRBD0600R020	6	0.2	12	50	6	2	●	2
MS2MRBD0600R030	6	0.3	12	50	6	2	●	2
MS2MRBD0600R050	6	0.5	12	50	6	2	●	2
MS2MRBD0600R100	6	1	12	50	6	2	●	2
MS2MRBD0600R150	6	1.5	12	50	6	2	●	2
MS2MRBD0600R200	6	2	12	50	6	2	●	2
MS2MRBD0800R020	8	0.2	16	60	8	2	★	2
MS2MRBD0800R030	8	0.3	16	60	8	2	★	2
MS2MRBD0800R050	8	0.5	16	60	8	2	★	2
MS2MRBD0800R100	8	1	16	60	8	2	★	2
MS2MRBD0800R150	8	1.5	16	60	8	2	★	2
MS2MRBD0800R200	8	2	16	60	8	2	★	2
MS2MRBD0800R250	8	2.5	16	60	8	2	★	2
MS2MRBD0800R300	8	3	16	60	8	2	★	2
MS2MRBD1000R020	10	0.2	20	70	10	2	★	2
MS2MRBD1000R030	10	0.3	20	70	10	2	★	2
MS2MRBD1000R050	10	0.5	20	70	10	2	★	2
MS2MRBD1000R100	10	1	20	70	10	2	★	2
MS2MRBD1000R150	10	1.5	20	70	10	2	★	2
MS2MRBD1000R200	10	2	20	70	10	2	★	2
MS2MRBD1000R250	10	2.5	20	70	10	2	★	2
MS2MRBD1000R300	10	3	20	70	10	2	★	2
MS2MRBD1200R020	12	0.2	24	75	12	2	★	2
MS2MRBD1200R030	12	0.3	24	75	12	2	★	2
MS2MRBD1200R050	12	0.5	24	75	12	2	★	2
MS2MRBD1200R100	12	1	24	75	12	2	★	2
MS2MRBD1200R150	12	1.5	24	75	12	2	★	2
MS2MRBD1200R200	12	2	24	75	12	2	★	2
MS2MRBD1200R250	12	2.5	24	75	12	2	★	2
MS2MRBD1200R300	12	3	24	75	12	2	★	2

MS2MRB

Corner radius end mill, Medium cut length, 2 flute

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.				Hardened steel (45—55HRC) AISI H13 etc.			
DC (mm)	Revolution (min^{-1})	Table feed		Depth of cut ae, ap (mm)	Revolution (min^{-1})	Table feed		Depth of cut ae, ap (mm)
		(mm/min)	(IPM)			(mm/min)	(IPM)	
0.1	40000	40	1.6	0.001	40000	40	1.6	0.001
0.2	40000	100	3.9	0.002	40000	100	3.9	0.002
0.3	40000	200	7.9	0.005	40000	200	7.9	0.005
0.4	40000	600	23.6	0.01	40000	600	23.6	0.01
0.5	40000	1000	39.4	0.015	40000	960	37.8	0.015
0.6	40000	1200	47.2	0.02	40000	1200	47.2	0.02
0.7	40000	1400	55.1	0.02	40000	1400	55.1	0.02
0.8	40000	1600	63.0	0.03	40000	1600	63.0	0.03
0.9	40000	1800	70.9	0.04	40000	1600	63.0	0.04
1	40000	2000	78.7	0.06	32000	1600	63.0	0.06
1.5	40000	3000	118.1	0.12	32000	1900	74.8	0.08
2	30000	3000	118.1	0.18	24000	1900	74.8	0.10
2.5	24000	2600	102.4	0.25	19000	1600	63.0	0.13
3	20000	2300	90.6	0.30	16000	1400	55.1	0.15
4	15000	2000	78.7	0.40	12000	1200	47.2	0.20
5	12000	1600	63.0	0.50	9000	900	35.4	0.25
6	10000	1400	55.1	0.60	7000	700	27.6	0.30
8	8000	1000	39.4	0.80	5600	550	21.7	0.40
10	6400	900	35.4	1.00	4500	500	19.7	0.50
12	5400	820	32.3	1.00	3800	450	17.7	0.50
16	2400	380	15.0	≤3	1200	100	3.9	≤0.8
20	1900	320	12.6	≤4	1000	80	3.1	≤1
Depth of cut								

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) In case of slotting with over 3 mm endmill, please reduce revolution to 50—70% of above value, and reduce feed rate to 40—60% of above value.
3) When drilling, please set the feed rate at 1/3 or below of the above value.
4) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

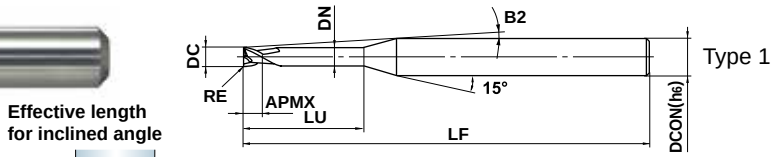
MS2XLRB

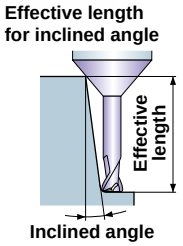
Corner radius end mill, Short cut length, 2 flute, Long neck

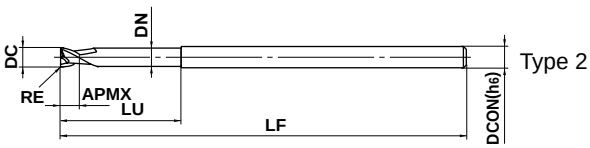


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		









1≤DC≤6			
0 - 0.020			
DCON=6			
0 - 0.008			

● 2 flute long neck corner radius end mill.

Unit : mm

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
MS2XLRBD0100R010N020	1	0.1	1	2	0.94	12.3°	60	6	2	●	1	2.1	2.3	2.4	2.8
MS2XLRB**D0100R010N050**	1	0.1	1	5	0.94	9.8°	60	6	2	●	1	5.3	5.6	6.0	6.5
MS2XLRB**D0200R010N040**	2	0.1	2	4	1.90	9.9°	60	6	2	●	1	4.2	4.4	4.8	5.2
MS2XLRB**D0200R010N100**	2	0.1	2	10	1.90	6.5°	60	6	2	●	1	10.5	10.9	11.7	12.6
MS2XLRB**D0200R030N040**	2	0.3	2	4	1.90	10°	60	6	2	●	1	4.2	4.4	4.7	5.1
MS2XLRB**D0200R030N100**	2	0.3	2	10	1.90	6.6°	60	6	2	●	1	10.5	10.8	11.6	12.6
MS2XLRB**D0300R010N060**	3	0.1	3	6	2.90	7.4°	50	6	2	●	1	6.3	6.6	7.1	7.6
MS2XLRB**D0300R010N150**	3	0.1	3	15	2.90	4.2°	60	6	2	●	1	15.7	16.2	17.4	18.8
MS2XLRB**D0300R030N060**	3	0.3	3	6	2.90	7.5°	50	6	2	●	1	6.3	6.6	7.0	7.6
MS2XLRB**D0300R030N150**	3	0.3	3	15	2.90	4.2°	60	6	2	●	1	15.7	16.2	17.4	18.8
MS2XLRB**D0400R010N080**	4	0.1	4	8	3.90	4.9°	50	6	2	●	1	8.4	8.7	9.4	10.1
MS2XLRB**D0400R010N200**	4	0.1	4	20	3.90	2.5°	60	6	2	●	1	20.8	21.6	23.2	*
MS2XLRB**D0400R030N080**	4	0.3	4	8	3.90	5°	50	6	2	●	1	8.4	8.7	9.3	10.1
MS2XLRB**D0400R030N200**	4	0.3	4	20	3.90	2.5°	60	6	2	●	1	20.8	21.5	23.1	*
MS2XLRB**D0400R050N080**	4	0.5	4	8	3.90	5°	50	6	2	●	1	8.4	8.7	9.3	10.0
MS2XLRB**D0400R050N200**	4	0.5	4	20	3.90	2.5°	60	6	2	●	1	20.8	21.5	23.1	*
MS2XLRB**D0600R010N120**	6	0.1	6	12	5.85	—	50	6	2	●	1	*	*	*	*
MS2XLRB**D0600R010N300**	6	0.1	6	30	5.85	—	70	6	2	●	1	*	*	*	*
MS2XLRB**D0600R030N120**	6	0.3	6	12	5.85	—	50	6	2	●	1	*	*	*	*
MS2XLRB**D0600R030N300**	6	0.3	6	30	5.85	—	70	6	2	●	1	*	*	*	*
MS2XLRB**D0600R050N120**	6	0.5	6	12	5.85	—	50	6	2	●	2	*	*	*	*
MS2XLRB**D0600R050N300**	6	0.5	6	30	5.85	—	70	6	2	●	2	*	*	*	*

* No interference

● : Inventory maintained.

MS2XLRB

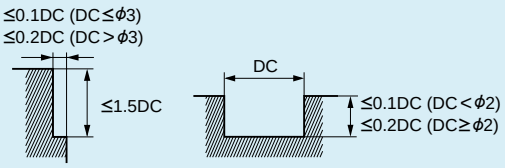
Corner radius end mill, Short cut length, 2 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

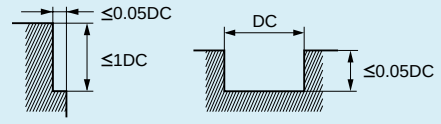
Work material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.		
DC (mm)	**LU** (mm)		Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
1	2	(2DC)	30000	600	23.6	20000	400	15.7	18000	300	11.8	15000	120	4.7
2	4		15000	600	23.6	10000	400	15.7	9100	300	11.8	8000	120	4.7
3	6		10000	600	23.6	7000	400	15.7	6000	300	11.8	5000	120	4.7
4	8		7500	600	23.6	5200	400	15.7	4500	300	11.8	4000	120	4.7
6	12		5000	600	23.6	3500	400	15.7	3000	300	11.8	2700	120	4.7
1	5	(5DC)	22000	350	13.8	17000	280	11.0	14000	200	7.9	12000	100	3.9
2	10		11000	350	13.8	8800	280	11.0	7200	200	7.9	6400	100	3.9
3	15		7400	350	13.8	5800	280	11.0	4800	200	7.9	4200	100	3.9
4	20		5600	350	13.8	4400	280	11.0	3600	200	7.9	3200	100	3.9
6	30		3700	350	13.8	2900	280	11.0	2400	200	7.9	2100	100	3.9

Depth of cut

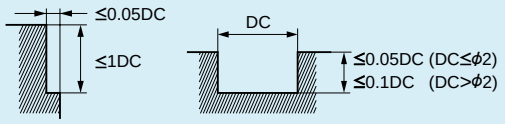
(LU=2DC)



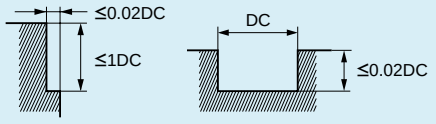
(LU=5DC)



(LU=2DC)



(LU=5DC)



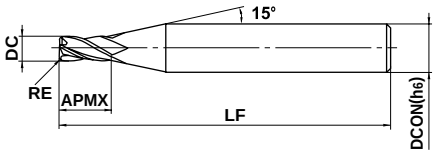
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.

MS4MRB

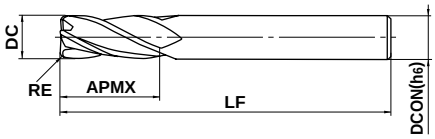
Corner radius end mill, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

h6

● 4 flute corner radius end mill for general use.

Unit : mm

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4MRBD0300R010	3	0.1	8	45	6	4	★	1
MS4MRB**D0300R020**	3	0.2	8	45	6	4	★	1
MS4MRB**D0300R030**	3	0.3	8	45	6	4	★	1
MS4MRB**D0300R050**	3	0.5	8	45	6	4	★	1
MS4MRB**D0300R100**	3	1	8	45	6	4	★	1
MS4MRB**D0400R010**	4	0.1	11	45	6	4	★	1
MS4MRB**D0400R020**	4	0.2	11	45	6	4	★	1
MS4MRB**D0400R030**	4	0.3	11	45	6	4	★	1
MS4MRB**D0400R050**	4	0.5	11	45	6	4	★	1
MS4MRB**D0400R100**	4	1	11	45	6	4	★	1
MS4MRB**D0500R010**	5	0.1	13	50	6	4	★	1
MS4MRB**D0500R020**	5	0.2	13	50	6	4	★	1
MS4MRB**D0500R030**	5	0.3	13	50	6	4	★	1
MS4MRB**D0500R050**	5	0.5	13	50	6	4	★	1
MS4MRB**D0500R100**	5	1	13	50	6	4	★	1
MS4MRB**D0600R010**	6	0.1	13	50	6	4	★	2
MS4MRB**D0600R020**	6	0.2	13	50	6	4	★	2
MS4MRB**D0600R030**	6	0.3	13	50	6	4	★	2
MS4MRB**D0600R050**	6	0.5	13	50	6	4	★	2
MS4MRB**D0600R100**	6	1	13	50	6	4	★	2
MS4MRB**D0600R150**	6	1.5	13	50	6	4	★	2
MS4MRB**D0600R200**	6	2	13	50	6	4	★	2
MS4MRB**D0800R020**	8	0.2	19	60	8	4	★	2
MS4MRB**D0800R030**	8	0.3	19	60	8	4	★	2
MS4MRB**D0800R050**	8	0.5	19	60	8	4	★	2
MS4MRB**D0800R100**	8	1	19	60	8	4	★	2
MS4MRB**D0800R150**	8	1.5	19	60	8	4	★	2
MS4MRB**D0800R200**	8	2	19	60	8	4	★	2
MS4MRB**D0800R250**	8	2.5	19	60	8	4	★	2
MS4MRB**D0800R300**	8	3	19	60	8	4	★	2
MS4MRB**D1000R020**	10	0.2	22	70	10	4	★	2

★ : Inventory maintained in Japan.

MS4MRB

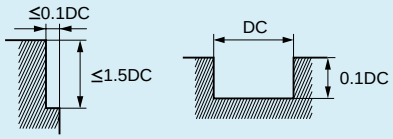
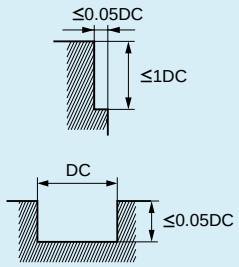
Corner radius end mill, Medium cut length, 4 flute

Unit : mm

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4MRBD1000R030	10	0.3	22	70	10	4	★	2
MS4MRB**D1000R050**	10	0.5	22	70	10	4	★	2
MS4MRB**D1000R100**	10	1	22	70	10	4	★	2
MS4MRB**D1000R150**	10	1.5	22	70	10	4	★	2
MS4MRB**D1000R200**	10	2	22	70	10	4	★	2
MS4MRB**D1000R250**	10	2.5	22	70	10	4	★	2
MS4MRB**D1000R300**	10	3	22	70	10	4	★	2
MS4MRB**D1200R020**	12	0.2	26	75	12	4	★	2
MS4MRB**D1200R030**	12	0.3	26	75	12	4	★	2
MS4MRB**D1200R050**	12	0.5	26	75	12	4	★	2
MS4MRB**D1200R100**	12	1	26	75	12	4	★	2
MS4MRB**D1200R150**	12	1.5	26	75	12	4	★	2
MS4MRB**D1200R200**	12	2	26	75	12	4	★	2
MS4MRB**D1200R250**	12	2.5	26	75	12	4	★	2
MS4MRB**D1200R300**	12	3	26	75	12	4	★	2
MS4MRB**D1600R050**	16	0.5	32	90	16	4	★	2
MS4MRB**D1600R100**	16	1	32	90	16	4	★	2
MS4MRB**D1600R150**	16	1.5	32	90	16	4	★	2
MS4MRB**D1600R200**	16	2	32	90	16	4	★	2
MS4MRB**D1600R250**	16	2.5	32	90	16	4	★	2
MS4MRB**D1600R300**	16	3	32	90	16	4	★	2
MS4MRB**D2000R050**	20	0.5	38	100	20	4	★	2
MS4MRB**D2000R100**	20	1	38	100	20	4	★	2
MS4MRB**D2000R150**	20	1.5	38	100	20	4	★	2
MS4MRB**D2000R200**	20	2	38	100	20	4	★	2
MS4MRB**D2000R250**	20	2.5	38	100	20	4	★	2
MS4MRB**D2000R300**	20	3	38	100	20	4	★	2

★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
3	16000	1500	59.1	10000	800	31.5	7400	480	18.9	8000	240	9.4
4	12000	1800	70.9	8000	1000	39.4	5600	600	23.6	6000	240	9.4
5	9600	1800	70.9	6400	1000	39.4	4400	600	23.6	4800	240	9.4
6	8000	1800	70.9	5300	1000	39.4	3700	600	23.6	4000	240	9.4
8	6000	1600	63.0	4000	900	35.4	2800	560	22.0	3000	240	9.4
10	4800	1400	55.1	3200	800	31.5	2200	500	19.7	2400	240	9.4
12	4000	1200	47.2	2700	700	27.6	1800	430	16.9	2000	230	9.1
16	3000	960	37.8	2000	560	22.0	1400	360	14.2	1500	190	7.5
20	2400	800	31.5	1600	480	18.9	1100	300	11.8	1200	170	6.7
Depth of cut												

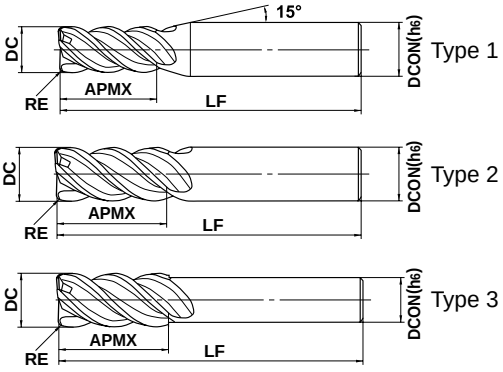
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) When drilling, please set the feed rate at 1/3 or below of the above value.
4) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MSMHDRB

High power, Corner radius, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎		◎	◎		





R				
0.2≤RE≤6.35				
±0.020				
DC≤12	DC>12			
0 - 0.020	0 - 0.030			
h6	4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20
	0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013

● 4 flute high power corner radius end mill.

Unit : mm

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MSMHDRBD0200R020	2	0.2	4	45	4	4	★	1
MSMHDRB**D0200R030**	2	0.3	4	45	4	4	★	1
MSMHDRB**D0300R020**	3	0.2	8	45	6	4	★	1
MSMHDRB**D0300R030**	3	0.3	8	45	6	4	★	1
MSMHDRB**D0300R050**	3	0.5	8	45	6	4	★	1
MSMHDRB**D0400R020**	4	0.2	11	45	6	4	★	1
MSMHDRB**D0400R030**	4	0.3	11	45	6	4	★	1
MSMHDRB**D0400R050**	4	0.5	11	45	6	4	★	1
MSMHDRB**D0500R020**	5	0.2	13	50	6	4	★	1
MSMHDRB**D0500R030**	5	0.3	13	50	6	4	★	1
MSMHDRB**D0500R050**	5	0.5	13	50	6	4	★	1
MSMHDRB**D0500R100**	5	1	13	50	6	4	★	1
MSMHDRB**D0600R030**	6	0.3	13	50	6	4	★	2
MSMHDRB**D0600R050**	6	0.5	13	50	6	4	★	2
MSMHDRB**D0600R100**	6	1	13	50	6	4	★	2
MSMHDRB**D0800R030**	8	0.3	19	60	8	4	★	2
MSMHDRB**D0800R050**	8	0.5	19	60	8	4	★	2
MSMHDRB**D0800R100**	8	1	19	60	8	4	★	2
MSMHDRB**D0800R150**	8	1.5	19	60	8	4	★	2
MSMHDRB**D1000R030**	10	0.3	22	70	10	4	★	2
MSMHDRB**D1000R050**	10	0.5	22	70	10	4	★	2
MSMHDRB**D1000R100**	10	1	22	70	10	4	★	2
MSMHDRB**D1000R150**	10	1.5	22	70	10	4	★	2
MSMHDRB**D1000R200**	10	2	22	70	10	4	★	2
MSMHDRB**D1200R050S10**	12	0.5	26	75	10	4	★	3
MSMHDRB**D1200R100S10**	12	1	26	75	10	4	★	3
MSMHDRB**D1200R150S10**	12	1.5	26	75	10	4	★	3
MSMHDRB**D1200R200S10**	12	2	26	75	10	4	★	3
MSMHDRB**D1200R300S10**	12	3	26	75	10	4	★	3
MSMHDRB**D1200R050**	12	0.5	26	75	12	4	★	2
MSMHDRB**D1200R100**	12	1	26	75	12	4	★	2

★ : Inventory maintained in Japan.

Unit : mm

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MSMHDRBD1200R150	12	1.5	26	75	12	4	★	2
MSMHDRB**D1200R200**	12	2	26	75	12	4	★	2
MSMHDRB**D1200R300**	12	3	26	75	12	4	★	2
MSMHDRB**D1600R100**	16	1	35	90	16	4	★	2
MSMHDRB**D1600R150**	16	1.5	35	90	16	4	★	2
MSMHDRB**D1600R200**	16	2	35	90	16	4	★	2
MSMHDRB**D1600R300**	16	3	35	90	16	4	★	2
MSMHDRB**D1600R500**	16	5	35	90	16	4	★	2
MSMHDRB**D1800R100**	18	1	40	100	16	4	★	3
MSMHDRB**D1800R150**	18	1.5	40	100	16	4	★	3
MSMHDRB**D1800R200**	18	2	40	100	16	4	★	3
MSMHDRB**D1800R300**	18	3	40	100	16	4	★	3
MSMHDRB**D2000R100**	20	1	45	110	20	4	★	2
MSMHDRB**D2000R150**	20	1.5	45	110	20	4	★	2
MSMHDRB**D2000R200**	20	2	45	110	20	4	★	2
MSMHDRB**D2000R300**	20	3	45	110	20	4	★	2
MSMHDRB**D2000R500**	20	5	45	110	20	4	★	2
MSMHDRB**D2000R635**	20	6.35	45	110	20	4	★	2

MSMHDRB

High power, Corner radius, Medium cut length, 4 flute

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
2	15000	550	21.7	10000	340	13.4	10000	320	12.6	6400	160	6.3	4800	100	3.9
3	11000	800	31.5	7400	500	19.7	7400	480	18.9	4800	250	9.8	4000	170	6.7
4	8000	900	35.4	5600	540	21.3	5600	520	20.5	3600	270	10.6	3200	240	9.4
5	6400	1000	39.4	4500	600	23.6	4500	580	22.8	2900	300	11.8	2600	240	9.4
6	5900	1100	43.3	3700	640	25.2	3700	600	23.6	2400	320	12.6	2100	230	9.1
8	4400	1100	43.3	2800	660	26.0	2800	600	23.6	1800	330	13.0	1600	220	8.7
10	3500	1000	39.4	2300	640	25.2	2300	560	22.0	1400	320	12.6	1300	200	7.9
12	2900	1000	39.4	1900	640	25.2	1900	530	20.9	1200	320	12.6	1100	170	6.7
16	2200	800	31.5	1400	500	19.7	1400	450	17.7	900	250	9.8	800	130	5.1
18	2000	800	31.5	1250	480	18.9	1250	450	17.7	800	240	9.4	640	100	3.9
20	1800	750	29.5	1100	460	18.1	1100	440	17.3	720	230	9.1	510	80	3.1
Depth of cut	≤0.2DC, ≤1.5DC						≤0.1DC, ≤1.5DC			≤0.05DC, ≤1.5DC					

Slotting

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
2	12000	400	15.7	7000	200	7.9	7000	100	3.9	4200	80	3.1	2300	40	1.6
3	9000	600	23.6	5300	300	11.8	5300	150	5.9	3200	130	5.1	1900	70	2.8
4	7200	720	28.3	4000	360	14.2	4000	180	7.1	2400	140	5.5	1400	95	3.7
5	5800	720	28.3	3200	360	14.2	3200	180	7.1	1900	150	5.9	1100	95	3.7
6	5000	800	31.5	2700	400	15.7	2700	200	7.9	1600	160	6.3	950	95	3.7
8	3700	800	31.5	2000	400	15.7	2000	200	7.9	1200	170	6.7	720	90	3.5
10	3000	720	28.3	1600	360	14.2	1600	180	7.1	960	160	6.3	570	80	3.1
12	2500	600	23.6	1300	290	11.4	1300	150	5.9	800	140	5.5	480	70	2.8
16	2000	480	18.9	1000	230	9.1	1000	120	4.7	600	110	4.3	360	50	2.0
18	1800	460	18.1	900	210	8.3	900	110	4.3	550	110	4.3	290	40	1.6
20	1600	430	16.9	800	200	7.9	800	100	3.9	480	100	3.9	230	35	1.4
Depth of cut	DC, ≤1DC (MAX. 12mm)						DC, ≤0.5DC			DC, ≤0.2DC					

1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

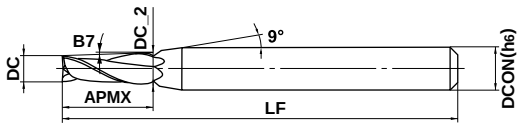
MS2MT

Taper end mill, Medium cut length, 2 flute

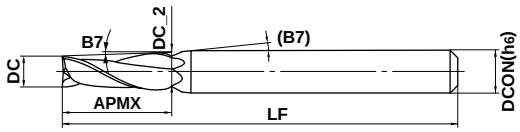
UWC MS 30° DC<0.4 DC≥0.4

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		

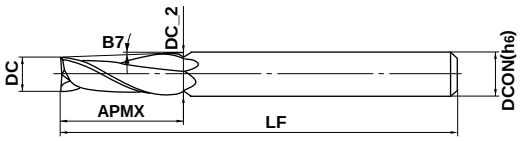




Type 1



Type 2



Type 3

DC<0.5	DC≥0.5			
0 - 0.020	0 - 0.030			
±5'				
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16		
0 - 0.008	0 - 0.009	0 - 0.011		

● 2 flute taper end mill for general use.

Unit : mm

Order Number	DC	B7	APMX	DC_2	LF	DCON	No. of Flutes	Stock	Type
MS2MTD0020T0030	0.2	30'	0.8	0.21	45	4	2	★	1
MS2MT**D0020T0100**	0.2	1°	0.8	0.23	45	4	2	★	1
MS2MT**D0020T0130**	0.2	1° 30'	0.8	0.24	45	4	2	★	1
MS2MT**D0020T0200**	0.2	2°	0.8	0.26	45	4	2	★	1
MS2MT**D0020T0300**	0.2	3°	0.8	0.28	45	4	2	★	1
MS2MT**D0020T0400**	0.2	4°	0.8	0.31	45	4	2	★	1
MS2MT**D0020T0500**	0.2	5°	0.8	0.34	45	4	2	★	1
MS2MT**D0020T0700**	0.2	7°	0.8	0.4	45	4	2	★	1
MS2MT**D0020T1000**	0.2	10°	0.8	0.48	45	4	2	★	2
MS2MT**D0030T0030**	0.3	30'	1.2	0.32	45	4	2	★	1
MS2MT**D0030T0100**	0.3	1°	1.2	0.34	45	4	2	★	1
MS2MT**D0030T0130**	0.3	1° 30'	1.2	0.36	45	4	2	★	1
MS2MT**D0030T0200**	0.3	2°	1.2	0.38	45	4	2	★	1
MS2MT**D0030T0300**	0.3	3°	1.2	0.43	45	4	2	★	1
MS2MT**D0030T0400**	0.3	4°	1.2	0.47	45	4	2	★	1
MS2MT**D0030T0500**	0.3	5°	1.2	0.51	45	4	2	★	1
MS2MT**D0030T0700**	0.3	7°	1.2	0.59	45	4	2	★	1
MS2MT**D0030T1000**	0.3	10°	1.2	0.72	45	4	2	★	2
MS2MT**D0040T0030**	0.4	30'	1.6	0.43	45	4	2	★	1
MS2MT**D0040T0100**	0.4	1°	1.6	0.46	45	4	2	★	1
MS2MT**D0040T0130**	0.4	1° 30'	1.6	0.48	45	4	2	★	1
MS2MT**D0040T0200**	0.4	2°	1.6	0.51	45	4	2	★	1
MS2MT**D0040T0300**	0.4	3°	1.6	0.57	45	4	2	★	1
MS2MT**D0040T0400**	0.4	4°	1.6	0.62	45	4	2	★	1
MS2MT**D0040T0500**	0.4	5°	1.6	0.68	45	4	2	★	1
MS2MT**D0040T0700**	0.4	7°	1.6	0.79	45	4	2	★	1
MS2MT**D0040T1000**	0.4	10°	1.6	0.96	45	4	2	★	2
MS2MT**D0050T0030**	0.5	30'	2	0.53	45	4	2	★	1
MS2MT**D0050T0100**	0.5	1°	2	0.57	45	4	2	★	1
MS2MT**D0050T0130**	0.5	1° 30'	2	0.6	45	4	2	★	1
MS2MT**D0050T0200**	0.5	2°	2	0.64	45	4	2	★	1

★ : Inventory maintained in Japan.

MS2MT

Taper end mill, Medium cut length, 2 flute

Unit : mm

Order Number	DC	B7	APMX	DC_2	LF	DCON	No. of Flutes	Stock	Type
MS2MTD0050T0300	0.5	3°	2	0.71	45	4	2	★	1
MS2MT**D0050T0400**	0.5	4°	2	0.78	45	4	2	★	1
MS2MT**D0050T0500**	0.5	5°	2	0.85	45	4	2	★	1
MS2MT**D0050T0700**	0.5	7°	2	0.99	45	4	2	★	1
MS2MT**D0050T1000**	0.5	10°	2	1.21	45	4	2	★	2
MS2MT**D0060T0030**	0.6	30'	2	0.63	45	4	2	★	1
MS2MT**D0060T0100**	0.6	1°	2	0.67	45	4	2	★	1
MS2MT**D0060T0130**	0.6	1° 30'	2	0.7	45	4	2	★	1
MS2MT**D0060T0200**	0.6	2°	2	0.74	45	4	2	★	1
MS2MT**D0060T0230**	0.6	2° 30'	2	0.77	45	4	2	★	1
MS2MT**D0060T0300**	0.6	3°	2	0.81	45	4	2	★	1
MS2MT**D0060T0400**	0.6	4°	2	0.88	45	4	2	★	1
MS2MT**D0060T0500**	0.6	5°	2	0.95	45	4	2	★	1
MS2MT**D0060T0700**	0.6	7°	2	1.09	45	4	2	★	1
MS2MT**D0060T1000**	0.6	10°	2	1.31	45	4	2	★	2
MS2MT**D0070T0030**	0.7	30'	2	0.73	45	4	2	★	1
MS2MT**D0070T0100**	0.7	1°	2	0.77	45	4	2	★	1
MS2MT**D0070T0130**	0.7	1° 30'	2	0.8	45	4	2	★	1
MS2MT**D0070T0200**	0.7	2°	2	0.84	45	4	2	★	1
MS2MT**D0070T0300**	0.7	3°	2	0.91	45	4	2	★	1
MS2MT**D0070T0400**	0.7	4°	2	0.98	45	4	2	★	1
MS2MT**D0070T0500**	0.7	5°	2	1.05	45	4	2	★	1
MS2MT**D0070T0700**	0.7	7°	2	1.19	45	4	2	★	1
MS2MT**D0070T1000**	0.7	10°	2	1.41	45	4	2	★	2
MS2MT**D0080T0030**	0.8	30'	3	0.85	45	4	2	★	1
MS2MT**D0080T0100**	0.8	1°	3	0.9	45	4	2	★	1
MS2MT**D0080T0130**	0.8	1° 30'	3	0.96	45	4	2	★	1
MS2MT**D0080T0200**	0.8	2°	3	1.01	45	4	2	★	1
MS2MT**D0080T0230**	0.8	2° 30'	3	1.06	45	4	2	★	1
MS2MT**D0080T0300**	0.8	3°	3	1.11	45	4	2	★	1
MS2MT**D0080T0400**	0.8	4°	3	1.22	45	4	2	★	1
MS2MT**D0080T0500**	0.8	5°	3	1.32	45	4	2	★	1
MS2MT**D0080T0700**	0.8	7°	3	1.54	45	4	2	★	1
MS2MT**D0080T1000**	0.8	10°	3	1.86	45	4	2	★	2
MS2MT**D0090T0030**	0.9	30'	3	0.95	45	4	2	★	1
MS2MT**D0090T0100**	0.9	1°	3	1	45	4	2	★	1
MS2MT**D0090T0130**	0.9	1° 30'	3	1.06	45	4	2	★	1
MS2MT**D0090T0200**	0.9	2°	3	1.11	45	4	2	★	1
MS2MT**D0090T0300**	0.9	3°	3	1.21	45	4	2	★	1
MS2MT**D0090T0400**	0.9	4°	3	1.32	45	4	2	★	1
MS2MT**D0090T0500**	0.9	5°	3	1.42	45	4	2	★	1
MS2MT**D0090T0700**	0.9	7°	3	1.64	45	4	2	★	1
MS2MT**D0090T1000**	0.9	10°	3	1.96	45	4	2	★	2
MS2MT**D0100T0030**	1	30'	4	1.07	45	4	2	★	1
MS2MT**D0100T0100**	1	1°	4	1.14	45	4	2	★	1
MS2MT**D0100T0130**	1	1° 30'	4	1.21	45	4	2	★	1
MS2MT**D0100T0200**	1	2°	4	1.28	45	4	2	★	1
MS2MT**D0100T0230**	1	2° 30'	4	1.35	45	4	2	★	1
MS2MT**D0100T0300**	1	3°	4	1.42	45	4	2	★	1
MS2MT**D0100T0400**	1	4°	4	1.56	45	4	2	★	1
MS2MT**D0100T0500**	1	5°	4	1.7	45	4	2	★	1

★ : Inventory maintained in Japan.

Unit : mm

Order Number	DC	B7	APMX	DC_2	LF	DCON	No. of Flutes	Stock	Type
MS2MTD0100T0700	1	7°	4	1.98	45	4	2	★	1
MS2MT**D0100T1000**	1	10°	4	2.41	45	4	2	★	2
MS2MT**D0150T0030**	1.5	30'	5	1.59	45	4	2	★	1
MS2MT**D0150T0100**	1.5	1°	5	1.67	45	4	2	★	1
MS2MT**D0150T0130**	1.5	1° 30'	5	1.76	45	4	2	★	1
MS2MT**D0150T0200**	1.5	2°	5	1.85	45	4	2	★	1
MS2MT**D0150T0230**	1.5	2° 30'	5	1.94	45	4	2	★	1
MS2MT**D0150T0300**	1.5	3°	5	2.02	45	4	2	★	1
MS2MT**D0150T0400**	1.5	4°	5	2.2	45	4	2	★	1
MS2MT**D0150T0500**	1.5	5°	5	2.37	45	4	2	★	1
MS2MT**D0150T0700**	1.5	7°	5	2.73	45	4	2	★	1
MS2MT**D0150T1000**	1.5	10°	5	3.26	45	4	2	★	2
MS2MT**D0200T0030**	2	30'	6	2.1	45	4	2	★	1
MS2MT**D0200T0100**	2	1°	6	2.21	45	4	2	★	1
MS2MT**D0200T0130**	2	1° 30'	6	2.31	45	4	2	★	1
MS2MT**D0200T0200**	2	2°	6	2.42	45	4	2	★	1
MS2MT**D0200T0230**	2	2° 30'	6	2.52	45	4	2	★	1
MS2MT**D0200T0300**	2	3°	6	2.63	45	4	2	★	1
MS2MT**D0200T0400**	2	4°	6	2.84	45	4	2	★	1
MS2MT**D0200T0500**	2	5°	6	3.05	45	4	2	★	1
MS2MT**D0200T0700**	2	7°	6	3.47	45	4	2	★	2
MS2MT**D0200T1000**	2	10°	6	4.12	50	6	2	★	2
MS2MT**D0250T0030**	2.5	30'	8	2.64	45	4	2	★	1
MS2MT**D0250T0100**	2.5	1°	8	2.78	45	4	2	★	1
MS2MT**D0250T0130**	2.5	1° 30'	8	2.92	45	4	2	★	1
MS2MT**D0250T0200**	2.5	2°	8	3.06	45	4	2	★	1
MS2MT**D0250T0230**	2.5	2° 30'	8	3.2	45	4	2	★	1
MS2MT**D0250T0300**	2.5	3°	8	3.34	45	4	2	★	1
MS2MT**D0250T0400**	2.5	4°	8	3.62	45	4	2	★	2
MS2MT**D0250T0500**	2.5	5°	8	3.9	45	4	2	★	2
MS2MT**D0250T0700**	2.5	7°	8	4.46	50	4	2	★	3
MS2MT**D0250T1000**	2.5	10°	8	5.32	50	6	2	★	2
MS2MT**D0300T0030**	3	30'	10	3.17	50	6	2	★	1
MS2MT**D0300T0100**	3	1°	10	3.35	50	6	2	★	1
MS2MT**D0300T0130**	3	1° 30'	10	3.52	50	6	2	★	1
MS2MT**D0300T0200**	3	2°	10	3.7	50	6	2	★	1
MS2MT**D0300T0300**	3	3°	10	4.05	50	6	2	★	1
MS2MT**D0300T0400**	3	4°	10	4.4	50	6	2	★	1
MS2MT**D0300T0500**	3	5°	10	4.75	50	6	2	★	1
MS2MT**D0300T0700**	3	7°	10	5.46	50	6	2	★	2
MS2MT**D0300T1000**	3	10°	10	6.53	50	6	2	★	3
MS2MT**D0400T0030**	4	30'	15	4.26	50	6	2	★	1
MS2MT**D0400T0100**	4	1°	15	4.52	50	6	2	★	1
MS2MT**D0400T0130**	4	1° 30'	15	4.79	50	6	2	★	1
MS2MT**D0400T0200**	4	2°	15	5.05	50	6	2	★	1
MS2MT**D0400T0300**	4	3°	15	5.57	50	6	2	★	1
MS2MT**D0400T0400**	4	4°	15	6.1	55	6	2	★	3
MS2MT**D0400T0500**	4	5°	15	6.62	55	6	2	★	3
MS2MT**D0400T0700**	4	7°	15	7.68	55	6	2	★	3
MS2MT**D0400T1000**	4	10°	15	9.29	60	8	2	★	3
MS2MT**D0500T0030**	5	30'	20	5.35	55	6	2	★	1

MS2MT

Taper end mill, Medium cut length, 2 flute

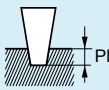
Unit : mm

Order Number	DC	B7	APMX	DC_2	LF	DCON	No. of Flutes	Stock	Type
MS2MTD0500T0100	5	1°	20	5.7	55	6	2	★	1
MS2MT**D0500T0130**	5	1° 30'	20	6.05	55	6	2	★	3
MS2MT**D0500T0200**	5	2°	20	6.4	55	6	2	★	3
MS2MT**D0500T0300**	5	3°	20	7.1	55	6	2	★	3
MS2MT**D0500T0400**	5	4°	20	7.8	60	6	2	★	3
MS2MT**D0500T0500**	5	5°	20	8.5	60	8	2	★	3
MS2MT**D0500T0700**	5	7°	20	9.91	70	10	2	★	2
MS2MT**D0500T1000**	5	10°	20	12.05	80	12	2	★	3
MS2MT**D0600T0030**	6	30'	20	6.35	60	6	2	★	3
MS2MT**D0600T0100**	6	1°	20	6.7	60	6	2	★	3
MS2MT**D0600T0130**	6	1° 30'	20	7.05	60	6	2	★	3
MS2MT**D0600T0200**	6	2°	20	7.4	60	6	2	★	3
MS2MT**D0600T0300**	6	3°	20	8.1	65	8	2	★	3
MS2MT**D0600T0500**	6	5°	20	9.5	70	8	2	★	3
MS2MT**D0800T0030**	8	30'	25	8.44	70	8	2	★	3
MS2MT**D0800T0100**	8	1°	25	8.87	70	8	2	★	3
MS2MT**D0800T0130**	8	1° 30'	25	9.31	70	8	2	★	3
MS2MT**D0800T0200**	8	2°	25	9.75	70	8	2	★	3
MS2MT**D0800T0300**	8	3°	25	10.62	75	10	2	★	3
MS2MT**D0800T0500**	8	5°	25	12.37	95	12	2	★	3
MS2MT**D1000T0030**	10	30'	35	10.61	90	10	2	★	3
MS2MT**D1000T0100**	10	1°	35	11.22	90	10	2	★	3
MS2MT**D1000T0130**	10	1° 30'	35	11.83	90	10	2	★	3
MS2MT**D1000T0200**	10	2°	35	12.44	95	12	2	★	3
MS2MT**D1000T0300**	10	3°	35	13.67	95	12	2	★	3
MS2MT**D1000T0500**	10	5°	35	16.12	95	16	2	★	3

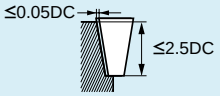
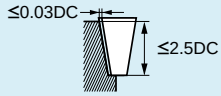
★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Slotting

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.				Hardened steel (45−55HRC) AISI H13 etc.			
DC (mm)	Revolution (min^{-1})	Table feed		Depth of cut (mm)	Revolution (min^{-1})	Table feed		Depth of cut (mm)	Revolution (min^{-1})	Table feed		Depth of cut (mm)
		(mm/min)	(IPM)			(mm/min)	(IPM)			(mm/min)	(IPM)	
0.2	40000	320	12.6	0.005	40000	180	7.1	0.004	40000	100	3.9	0.002
0.3	40000	400	15.7	0.006	40000	220	8.7	0.005	35000	130	5.1	0.003
0.4	40000	450	17.7	0.008	40000	270	10.6	0.006	31000	150	5.9	0.004
0.5	37000	500	19.7	0.010	32000	320	12.6	0.008	25000	160	6.3	0.005
0.6	32000	530	20.9	0.013	26000	340	13.4	0.010	21000	170	6.7	0.006
0.7	27000	560	22.0	0.015	23000	380	15.0	0.011	18000	180	7.1	0.007
0.8	24000	610	24.0	0.018	20000	410	16.1	0.013	16000	210	8.3	0.008
0.9	21000	610	24.0	0.020	18000	450	17.7	0.015	14000	210	8.3	0.009
1	19000	610	24.0	0.025	16000	450	17.7	0.020	13000	210	8.3	0.010
1.5	13000	720	28.3	0.040	11000	540	21.3	0.030	8500	270	10.6	0.015
Depth of cut	 Please refer to the list.											

Shoulder milling

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Hardened steel (45−55HRC) AISI H13 etc.		
DC (mm)	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed	
		(mm/min)	(IPM)		(mm/min)	(IPM)		(mm/min)	(IPM)
2	9500	720	28.3	8000	540	21.3	6400	300	11.8
2.5	7800	800	31.5	6300	540	21.3	5000	300	11.8
3	6400	800	31.5	5300	540	21.3	4200	300	11.8
4	4800	800	31.5	4000	540	21.3	3200	300	11.8
5	3800	800	31.5	3200	540	21.3	2500	300	11.8
6	3200	800	31.5	2600	540	21.3	2100	300	11.8
8	2400	700	27.6	2000	480	18.9	1600	270	10.6
10	1900	600	23.6	1600	410	16.1	1300	240	9.4
Depth of cut									

DC:End point diameter

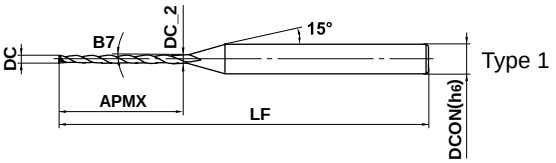
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MS4LT

Taper end mill, Long cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○			





Type 1

DC<0.5	DC≥0.5			
0 - 0.020	0 - 0.040			
±5'				
DCON=3	4≤DCON≤6			
0 - 0.006	0 - 0.008			

● 4 flute taper end mill for rib milling.

Unit : mm

Order Number	DC	B7	APMX	DC_2	LF	DCON	No. of Flutes	Stock	Type
MS4LTD0020T0030L02	0.2	30'	2	0.23	40	3	4	★	1
MS4LT**D0020T0100L02**	0.2	1°	2	0.27	40	3	4	★	1
MS4LT**D0020T0130L02**	0.2	1° 30'	2	0.3	40	3	4	★	1
MS4LT**D0020T0200L02**	0.2	2°	2	0.34	40	3	4	★	1
MS4LT**D0030T0030L03**	0.3	30'	3	0.35	40	3	4	★	1
MS4LT**D0030T0100L03**	0.3	1°	3	0.4	40	3	4	★	1
MS4LT**D0030T0130L03**	0.3	1° 30'	3	0.46	40	3	4	★	1
MS4LT**D0030T0200L03**	0.3	2°	3	0.51	40	3	4	★	1
MS4LT**D0040T0030L04**	0.4	30'	4	0.47	40	3	4	★	1
MS4LT**D0040T0100L04**	0.4	1°	4	0.54	40	3	4	★	1
MS4LT**D0040T0130L04**	0.4	1° 30'	4	0.61	40	3	4	★	1
MS4LT**D0040T0200L04**	0.4	2°	4	0.68	40	3	4	★	1
MS4LT**D0050T0030L04**	0.5	30'	4	0.57	40	3	4	●	1
MS4LT**D0050T0030L06**	0.5	30'	6	0.6	40	3	4	●	1
MS4LT**D0050T0100L04**	0.5	1°	4	0.64	40	3	4	●	1
MS4LT**D0050T0100L06**	0.5	1°	6	0.71	40	3	4	●	1
MS4LT**D0050T0130L04**	0.5	1° 30'	4	0.71	40	3	4	●	1
MS4LT**D0050T0130L06**	0.5	1° 30'	6	0.81	40	3	4	●	1
MS4LT**D0050T0200L04**	0.5	2°	4	0.78	40	3	4	★	1
MS4LT**D0050T0200L06**	0.5	2°	6	0.92	40	3	4	★	1
MS4LT**D0060T0030L04**	0.6	30'	4	0.67	40	3	4	★	1
MS4LT**D0060T0030L06**	0.6	30'	6	0.7	40	3	4	★	1
MS4LT**D0060T0100L04**	0.6	1°	4	0.74	40	3	4	★	1
MS4LT**D0060T0100L06**	0.6	1°	6	0.81	40	3	4	★	1
MS4LT**D0060T0130L04**	0.6	1° 30'	4	0.81	40	3	4	★	1
MS4LT**D0060T0130L06**	0.6	1° 30'	6	0.91	40	3	4	★	1
MS4LT**D0060T0200L04**	0.6	2°	4	0.88	40	3	4	★	1
MS4LT**D0060T0200L06**	0.6	2°	6	1.02	40	3	4	★	1
MS4LT**D0070T0030L06**	0.7	30'	6	0.8	40	3	4	★	1
MS4LT**D0070T0030L08**	0.7	30'	8	0.84	45	3	4	★	1
MS4LT**D0070T0100L06**	0.7	1°	6	0.91	40	3	4	★	1

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	DC	B7	APMX	DC_2	LF	DCON	No. of Flutes	Stock	Type
MS4LTD0070T0100L08	0.7	1°	8	0.98	45	3	4	★	1
MS4LTD0070T0130L06	0.7	1° 30'	6	1.01	40	3	4	★	1
MS4LTD0070T0130L08	0.7	1° 30'	8	1.12	45	3	4	★	1
MS4LTD0070T0200L06	0.7	2°	6	1.12	40	3	4	★	1
MS4LTD0070T0200L08	0.7	2°	8	1.26	45	3	4	★	1
MS4LTD0080T0015L04	0.8	15'	4	0.83	45	4	4	★	1
MS4LTD0080T0015L06	0.8	15'	6	0.85	45	4	4	★	1
MS4LTD0080T0015L08	0.8	15'	8	0.87	45	4	4	★	1
MS4LTD0080T0015L10	0.8	15'	10	0.89	45	4	4	★	1
MS4LTD0080T0030L04	0.8	30'	4	0.87	45	4	4	★	1
MS4LTD0080T0030L06	0.8	30'	6	0.9	45	4	4	●	1
MS4LTD0080T0030L08	0.8	30'	8	0.94	45	4	4	●	1
MS4LTD0080T0030L10	0.8	30'	10	0.97	45	4	4	●	1
MS4LTD0080T0030L12	0.8	30'	12	1.01	50	4	4	●	1
MS4LTD0080T0100L04	0.8	1°	4	0.94	45	4	4	★	1
MS4LTD0080T0100L06	0.8	1°	6	1.01	45	4	4	●	1
MS4LTD0080T0100L08	0.8	1°	8	1.08	45	4	4	●	1
MS4LTD0080T0100L10	0.8	1°	10	1.15	45	4	4	●	1
MS4LTD0080T0100L12	0.8	1°	12	1.22	50	4	4	●	1
MS4LTD0080T0130L04	0.8	1° 30'	4	1.01	45	4	4	★	1
MS4LTD0080T0130L06	0.8	1° 30'	6	1.11	45	4	4	★	1
MS4LTD0080T0130L08	0.8	1° 30'	8	1.22	45	4	4	★	1
MS4LTD0080T0130L10	0.8	1° 30'	10	1.32	45	4	4	★	1
MS4LTD0080T0130L12	0.8	1° 30'	12	1.43	50	4	4	★	1
MS4LTD0080T0200L04	0.8	2°	4	1.08	45	4	4	★	1
MS4LTD0080T0200L06	0.8	2°	6	1.22	45	4	4	★	1
MS4LTD0080T0200L08	0.8	2°	8	1.36	45	4	4	★	1
MS4LTD0080T0200L10	0.8	2°	10	1.5	45	4	4	★	1
MS4LTD0080T0200L12	0.8	2°	12	1.64	50	4	4	★	1
MS4LTD0100T0015L06	1	15'	6	1.05	45	4	4	★	1
MS4LTD0100T0015L08	1	15'	8	1.07	45	4	4	★	1
MS4LTD0100T0015L10	1	15'	10	1.09	45	4	4	★	1
MS4LTD0100T0015L12	1	15'	12	1.1	50	4	4	★	1
MS4LTD0100T0030L06	1	30'	6	1.1	45	4	4	●	1
MS4LTD0100T0030L08	1	30'	8	1.14	45	4	4	●	1
MS4LTD0100T0030L10	1	30'	10	1.17	45	4	4	●	1
MS4LTD0100T0030L12	1	30'	12	1.21	50	4	4	●	1
MS4LTD0100T0100L06	1	1°	6	1.21	45	4	4	●	1
MS4LTD0100T0100L08	1	1°	8	1.28	45	4	4	●	1
MS4LTD0100T0100L10	1	1°	10	1.35	45	4	4	●	1
MS4LTD0100T0100L12	1	1°	12	1.42	50	4	4	●	1
MS4LTD0100T0100L16	1	1°	16	1.56	55	4	4	●	1
MS4LTD0100T0130L06	1	1° 30'	6	1.31	45	4	4	●	1
MS4LTD0100T0130L08	1	1° 30'	8	1.42	45	4	4	●	1
MS4LTD0100T0130L10	1	1° 30'	10	1.52	45	4	4	●	1
MS4LTD0100T0130L12	1	1° 30'	12	1.63	50	4	4	●	1
MS4LTD0100T0130L16	1	1° 30'	16	1.84	55	4	4	●	1
MS4LTD0100T0200L06	1	2°	6	1.42	45	4	4	★	1
MS4LTD0100T0200L08	1	2°	8	1.56	45	4	4	★	1
MS4LTD0100T0200L10	1	2°	10	1.7	45	4	4	★	1
MS4LTD0100T0200L12	1	2°	12	1.84	50	4	4	★	1

MS4LT

Taper end mill, Long cut length, 4 flute

Unit : mm

Order Number	DC	B7	APMX	DC_2	LF	DCON	No. of Flutes	Stock	Type
MS4LTD0100T0200L16	1	2°	16	2.12	55	4	4	★	1
MS4LT**D0120T0015L06**	1.2	15'	6	1.25	45	4	4	★	1
MS4LT**D0120T0015L10**	1.2	15'	10	1.29	45	4	4	★	1
MS4LT**D0120T0015L12**	1.2	15'	12	1.3	50	4	4	★	1
MS4LT**D0120T0015L16**	1.2	15'	16	1.34	55	4	4	★	1
MS4LT**D0120T0030L06**	1.2	30'	6	1.3	45	4	4	★	1
MS4LT**D0120T0030L10**	1.2	30'	10	1.37	45	4	4	★	1
MS4LT**D0120T0030L12**	1.2	30'	12	1.41	50	4	4	★	1
MS4LT**D0120T0030L16**	1.2	30'	16	1.48	55	4	4	★	1
MS4LT**D0120T0100L06**	1.2	1°	6	1.41	45	4	4	★	1
MS4LT**D0120T0100L10**	1.2	1°	10	1.55	45	4	4	★	1
MS4LT**D0120T0100L12**	1.2	1°	12	1.62	50	4	4	★	1
MS4LT**D0120T0100L16**	1.2	1°	16	1.76	55	4	4	★	1
MS4LT**D0120T0100L20**	1.2	1°	20	1.9	55	4	4	★	1
MS4LT**D0120T0130L06**	1.2	1° 30'	6	1.51	45	4	4	★	1
MS4LT**D0120T0130L10**	1.2	1° 30'	10	1.72	45	4	4	★	1
MS4LT**D0120T0130L12**	1.2	1° 30'	12	1.83	50	4	4	★	1
MS4LT**D0120T0130L16**	1.2	1° 30'	16	2.04	55	4	4	★	1
MS4LT**D0120T0130L20**	1.2	1° 30'	20	2.25	55	4	4	★	1
MS4LT**D0120T0200L06**	1.2	2°	6	1.62	45	4	4	★	1
MS4LT**D0120T0200L10**	1.2	2°	10	1.9	45	4	4	★	1
MS4LT**D0120T0200L12**	1.2	2°	12	2.04	50	4	4	★	1
MS4LT**D0120T0200L16**	1.2	2°	16	2.32	55	4	4	★	1
MS4LT**D0120T0200L20**	1.2	2°	20	2.6	55	4	4	★	1
MS4LT**D0130T0030L12**	1.3	30'	12	1.51	50	4	4	★	1
MS4LT**D0130T0100L12**	1.3	1°	12	1.72	50	4	4	★	1
MS4LT**D0130T0130L12**	1.3	1° 30'	12	1.93	50	4	4	★	1
MS4LT**D0130T0200L12**	1.3	2°	12	2.14	50	4	4	★	1
MS4LT**D0140T0030L12**	1.4	30'	12	1.61	50	4	4	★	1
MS4LT**D0140T0100L12**	1.4	1°	12	1.82	50	4	4	★	1
MS4LT**D0140T0130L12**	1.4	1° 30'	12	2.03	50	4	4	★	1
MS4LT**D0140T0200L12**	1.4	2°	12	2.24	50	4	4	★	1
MS4LT**D0150T0015L06**	1.5	15'	6	1.55	45	4	4	★	1
MS4LT**D0150T0015L08**	1.5	15'	8	1.57	45	4	4	★	1
MS4LT**D0150T0015L10**	1.5	15'	10	1.59	45	4	4	★	1
MS4LT**D0150T0015L12**	1.5	15'	12	1.6	50	4	4	★	1
MS4LT**D0150T0015L16**	1.5	15'	16	1.64	55	4	4	★	1
MS4LT**D0150T0015L20**	1.5	15'	20	1.67	55	4	4	★	1
MS4LT**D0150T0030L06**	1.5	30'	6	1.6	45	4	4	★	1
MS4LT**D0150T0030L08**	1.5	30'	8	1.64	45	4	4	★	1
MS4LT**D0150T0030L10**	1.5	30'	10	1.67	45	4	4	●	1
MS4LT**D0150T0030L12**	1.5	30'	12	1.71	50	4	4	★	1
MS4LT**D0150T0030L16**	1.5	30'	16	1.78	55	4	4	●	1
MS4LT**D0150T0030L20**	1.5	30'	20	1.85	55	4	4	★	1
MS4LT**D0150T0100L06**	1.5	1°	6	1.71	45	4	4	★	1
MS4LT**D0150T0100L08**	1.5	1°	8	1.78	45	4	4	★	1
MS4LT**D0150T0100L10**	1.5	1°	10	1.85	45	4	4	●	1
MS4LT**D0150T0100L12**	1.5	1°	12	1.92	50	4	4	★	1
MS4LT**D0150T0100L16**	1.5	1°	16	2.06	55	4	4	●	1
MS4LT**D0150T0100L20**	1.5	1°	20	2.2	55	4	4	★	1
MS4LT**D0150T0100L25**	1.5	1°	25	2.37	60	4	4	★	1

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	DC	B7	APMX	DC_2	LF	DCON	No. of Flutes	Stock	Type
MS4LTD0150T0130L06	1.5	1° 30'	6	1.81	45	4	4	★	1
MS4LTD0150T0130L08	1.5	1° 30'	8	1.92	45	4	4	★	1
MS4LTD0150T0130L10	1.5	1° 30'	10	2.02	45	4	4	★	1
MS4LTD0150T0130L12	1.5	1° 30'	12	2.13	50	4	4	★	1
MS4LTD0150T0130L16	1.5	1° 30'	16	2.34	55	4	4	★	1
MS4LTD0150T0130L20	1.5	1° 30'	20	2.55	55	4	4	★	1
MS4LTD0150T0130L25	1.5	1° 30'	25	2.81	60	4	4	★	1
MS4LTD0150T0200L06	1.5	2°	6	1.92	45	4	4	★	1
MS4LTD0150T0200L08	1.5	2°	8	2.06	45	4	4	★	1
MS4LTD0150T0200L10	1.5	2°	10	2.2	45	4	4	★	1
MS4LTD0150T0200L12	1.5	2°	12	2.34	50	4	4	★	1
MS4LTD0150T0200L16	1.5	2°	16	2.62	55	4	4	★	1
MS4LTD0150T0200L20	1.5	2°	20	2.9	55	4	4	★	1
MS4LTD0150T0200L25	1.5	2°	25	3.25	60	4	4	★	1
MS4LTD0160T0030L08	1.6	30'	8	1.74	45	4	4	★	1
MS4LTD0160T0030L12	1.6	30'	12	1.81	50	4	4	★	1
MS4LTD0160T0030L16	1.6	30'	16	1.88	55	4	4	★	1
MS4LTD0160T0030L20	1.6	30'	20	1.95	55	4	4	★	1
MS4LTD0160T0100L08	1.6	1°	8	1.88	45	4	4	★	1
MS4LTD0160T0100L12	1.6	1°	12	2.02	50	4	4	★	1
MS4LTD0160T0100L16	1.6	1°	16	2.16	55	4	4	★	1
MS4LTD0160T0100L20	1.6	1°	20	2.3	55	4	4	★	1
MS4LTD0160T0130L08	1.6	1° 30'	8	2.02	45	4	4	★	1
MS4LTD0160T0130L12	1.6	1° 30'	12	2.23	50	4	4	★	1
MS4LTD0160T0130L16	1.6	1° 30'	16	2.44	55	4	4	★	1
MS4LTD0160T0130L20	1.6	1° 30'	20	2.65	55	4	4	★	1
MS4LTD0160T0200L08	1.6	2°	8	2.16	45	4	4	★	1
MS4LTD0160T0200L12	1.6	2°	12	2.44	50	4	4	★	1
MS4LTD0160T0200L16	1.6	2°	16	2.72	55	4	4	★	1
MS4LTD0160T0200L20	1.6	2°	20	3	55	4	4	★	1
MS4LTD0180T0015L08	1.8	15'	8	1.87	45	4	4	★	1
MS4LTD0180T0015L16	1.8	15'	16	1.94	55	4	4	★	1
MS4LTD0180T0015L24	1.8	15'	24	2.01	60	4	4	★	1
MS4LTD0180T0030L08	1.8	30'	8	1.94	45	4	4	★	1
MS4LTD0180T0030L16	1.8	30'	16	2.08	55	4	4	★	1
MS4LTD0180T0030L24	1.8	30'	24	2.22	60	4	4	★	1
MS4LTD0180T0100L08	1.8	1°	8	2.08	45	4	4	★	1
MS4LTD0180T0100L16	1.8	1°	16	2.36	55	4	4	★	1
MS4LTD0180T0100L24	1.8	1°	24	2.64	60	4	4	★	1
MS4LTD0180T0130L08	1.8	1° 30'	8	2.22	45	4	4	★	1
MS4LTD0180T0130L16	1.8	1° 30'	16	2.64	55	4	4	★	1
MS4LTD0180T0130L24	1.8	1° 30'	24	3.06	60	4	4	★	1
MS4LTD0180T0200L08	1.8	2°	8	2.36	45	4	4	★	1
MS4LTD0180T0200L16	1.8	2°	16	2.92	55	4	4	★	1
MS4LTD0180T0200L24	2	2°	24	3.48	60	4	4	★	1
MS4LTD0200T0015L08	2	15'	8	2.07	45	4	4	★	1
MS4LTD0200T0015L10	2	15'	10	2.09	45	4	4	★	1
MS4LTD0200T0015L12	2	15'	12	2.1	50	4	4	★	1
MS4LTD0200T0015L16	2	15'	16	2.14	55	4	4	★	1
MS4LTD0200T0015L20	2	15'	20	2.17	55	4	4	★	1
MS4LTD0200T0015L25	2	15'	25	2.22	60	4	4	★	1

MS4LT

Taper end mill, Long cut length, 4 flute

Unit : mm

Order Number	DC	B7	APMX	DC_2	LF	DCON	No. of Flutes	Stock	Type
MS4LTD0200T0030L08	2	30'	8	2.14	45	4	4	★	1
MS4LTD0200T0030L10	2	30'	10	2.17	45	4	4	●	1
MS4LTD0200T0030L12	2	30'	12	2.21	50	4	4	★	1
MS4LTD0200T0030L16	2	30'	16	2.28	55	4	4	★	1
MS4LTD0200T0030L20	2	30'	20	2.35	55	4	4	●	1
MS4LTD0200T0030L25	2	30'	25	2.44	60	4	4	★	1
MS4LTD0200T0030L30	2	30'	30	2.52	65	4	4	★	1
MS4LTD0200T0100L08	2	1°	8	2.28	45	4	4	★	1
MS4LTD0200T0100L10	2	1°	10	2.35	45	4	4	●	1
MS4LTD0200T0100L12	2	1°	12	2.42	50	4	4	★	1
MS4LTD0200T0100L16	2	1°	16	2.56	55	4	4	●	1
MS4LTD0200T0100L20	2	1°	20	2.7	55	4	4	●	1
MS4LTD0200T0100L25	2	1°	25	2.87	60	4	4	★	1
MS4LTD0200T0100L30	2	1°	30	3.05	65	4	4	★	1
MS4LTD0200T0130L08	2	1° 30'	8	2.42	45	4	4	★	1
MS4LTD0200T0130L10	2	1° 30'	10	2.52	45	4	4	●	1
MS4LTD0200T0130L12	2	1° 30'	12	2.63	50	4	4	★	1
MS4LTD0200T0130L16	2	1° 30'	16	2.84	55	4	4	●	1
MS4LTD0200T0130L20	2	1° 30'	20	3.05	55	4	4	●	1
MS4LTD0200T0130L25	2	1° 30'	25	3.31	60	4	4	★	1
MS4LTD0200T0130L30	2	1° 30'	30	3.57	65	4	4	★	1
MS4LTD0200T0200L08	2	2°	8	2.56	45	4	4	★	1
MS4LTD0200T0200L10	2	2°	10	2.7	45	4	4	★	1
MS4LTD0200T0200L12	2	2°	12	2.84	50	4	4	★	1
MS4LTD0200T0200L16	2	2°	16	3.12	55	4	4	★	1
MS4LTD0200T0200L20	2	2°	20	3.4	55	4	4	★	1
MS4LTD0200T0200L25	2	2°	25	3.75	60	4	4	★	1
MS4LTD0200T0200L30	2	2°	30	4.1	65	6	4	★	1
MS4LTD0200T0300L12	2	3°	12	3.26	50	4	4	★	1
MS4LTD0200T0300L16	2	3°	16	3.68	55	4	4	★	1
MS4LTD0200T0300L20	2	3°	20	4.1	55	6	4	★	1
MS4LTD0200T0300L25	2	3°	25	4.62	60	6	4	★	1
MS4LTD0200T0300L30	2	3°	30	5.14	65	6	4	★	1
MS4LTD0250T0030L10	2.5	30'	10	2.67	45	4	4	★	1
MS4LTD0250T0030L16	2.5	30'	16	2.78	50	4	4	★	1
MS4LTD0250T0030L20	2.5	30'	20	2.85	55	4	4	★	1
MS4LTD0250T0030L25	2.5	30'	25	2.94	60	4	4	★	1
MS4LTD0250T0030L30	2.5	30'	30	3.02	65	4	4	★	1
MS4LTD0250T0100L10	2.5	1°	10	2.85	45	4	4	★	1
MS4LTD0250T0100L16	2.5	1°	16	3.06	50	4	4	★	1
MS4LTD0250T0100L20	2.5	1°	20	3.2	55	4	4	★	1
MS4LTD0250T0100L25	2.5	1°	25	3.37	60	4	4	★	1
MS4LTD0250T0100L30	2.5	1°	30	3.55	65	4	4	★	1
MS4LTD0250T0130L10	2.5	1° 30'	10	3.02	45	4	4	★	1
MS4LTD0250T0130L16	2.5	1° 30'	16	3.34	50	4	4	★	1
MS4LTD0250T0130L20	2.5	1° 30'	20	3.55	55	4	4	★	1
MS4LTD0250T0130L25	2.5	1° 30'	25	3.81	60	4	4	★	1
MS4LTD0250T0130L30	2.5	1° 30'	30	4.07	65	6	4	★	1
MS4LTD0250T0200L10	2.5	2°	10	3.2	45	4	4	★	1
MS4LTD0250T0200L16	2.5	2°	16	3.62	50	4	4	★	1
MS4LTD0250T0200L20	2.5	2°	20	3.9	55	4	4	★	1

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	DC	B7	APMX	DC_2	LF	DCON	No. of Flutes	Stock	Type
MS4LTD0250T0200L25	2.5	2°	25	4.25	60	6	4	★	1
MS4LT**D0250T0200L30**	2.5	2°	30	4.6	65	6	4	★	1
MS4LT**D0300T0030L25**	3	30'	25	3.44	65	6	4	★	1
MS4LT**D0300T0030L40**	3	30'	40	3.7	80	6	4	★	1
MS4LT**D0300T0100L25**	3	1°	25	3.87	65	6	4	★	1
MS4LT**D0300T0100L40**	3	1°	40	4.4	80	6	4	★	1
MS4LT**D0300T0130L25**	3	1° 30'	25	4.31	65	6	4	★	1
MS4LT**D0300T0130L40**	3	1° 30'	40	5.09	80	6	4	★	1
MS4LT**D0300T0200L25**	3	2°	25	4.75	65	6	4	★	1
MS4LT**D0300T0200L40**	3	2°	40	5.79	80	6	4	★	1

MS4LT

Taper end mill, Long cut length, 4 flute

RECOMMENDED CUTTING CONDITIONS

Work material			Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.				Hardened steel (45−55HRC) AISI H13 etc.			
DC (mm)	PRFRAD (mm)	APMX (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
0.2	—	2	20000−40000	200−500	7.9−19.7	0.001	20000−40000	150−300	5.9−11.8	0.001
0.3	—	3	20000−40000	200−500	7.9−19.7	0.002	20000−40000	150−300	5.9−11.8	0.001
0.4	—	4	20000−40000	200−500	7.9−19.7	0.003	20000−36000	150−300	5.9−11.8	0.002
0.5	—	4	20000−38000	200−500	7.9−19.7	0.01	16000−29000	200−400	7.9−15.8	0.005
		6				0.005				0.003
0.6	R 0.3	4	18000−32000	250−600	9.9−23.6	0.01	13000−24000	200−400	7.9−15.8	0.005
		6				0.007				0.004
0.7	—	6	16000−27000	250−600	9.9−23.6	0.015	11000−20000	200−400	7.9−15.8	0.008
		8				0.01				0.005
0.8	R 0.4	4	14000−24000	250−600	9.9−23.6	0.03	10000−18000	200−400	7.9−15.8	0.015
		8				0.02				0.01
		12				0.013				0.007
1.0	R 0.5	6	11000−19000	300−800	11.8−31.5	0.03	8000−14000	200−500	7.9−19.7	0.015
		10				0.02				0.01
		16				0.015				0.008
1.2	R 0.6	6	9200−16000	300−800	11.8−31.5	0.04	6600−12000	200−500	7.9−19.7	0.02
		10				0.03				0.015
		16				0.02				0.01
1.3	—	12	8500−15000	300−800	11.8−31.5	0.03	6100−11000	200−500	7.9−19.7	0.015
1.4	—	12	8000−14000	300−800	11.8−31.5	0.035	5700−10000	200−500	7.9−19.7	0.018
1.5	R 0.75	6	7500−13000	300−800	11.8−31.5	0.06	5300−9500	200−500	7.9−19.7	0.03
		10				0.04				0.02
		16				0.03				0.015
		25				0.015				0.008
1.6	—	8	7000−12000	300−800	11.8−31.5	0.06	5000−9000	200−500	7.9−19.7	0.03
		12				0.045				0.025
		16				0.035				0.02
		20				0.025				0.015
1.8	R 0.9	8	6200−11000	300−800	11.8−31.5	0.08	4400−8000	200−500	7.9−19.7	0.04
		16				0.05				0.03
		24				0.03				0.015
2.0	R 1	8	5500−9500	300−800	11.8−31.5	0.1	4000−7200	200−500	7.9−19.7	0.05
		12				0.07				0.04
		20				0.04				0.02
		30				0.02				0.01
2.5	—	10	4400−7600	300−800	11.8−31.5	0.1	3200−5700	200−500	7.9−19.7	0.05
		20				0.06				0.03
		30				0.03				0.015
3.0	—	25	3700−6400	300−800	11.8−31.5	0.08	2700−4800	200−500	7.9−19.7	0.04
		40				0.04				0.02

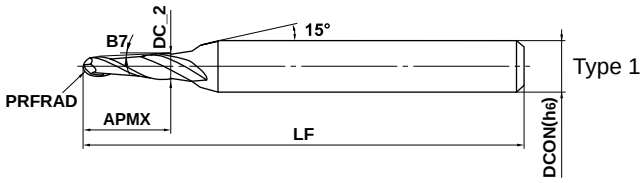
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MS2MTB

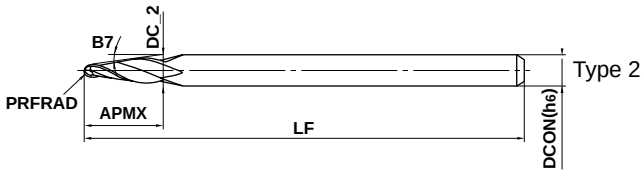
Ball nose taper end mill, Medium cut length, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Titanium Alloy Heat Resistant Alloy	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

R	0.2≤PRFRAD≤1.5				
	±0.01				
	±5'				
h6	4≤DCON≤6				
	0 - 0.008				

● 2 flute taper ball nose end mill.

Unit : mm

Order Number	PRFRAD	B7	APMX	DC_2	LF	DCON	No. of Flutes	Stock	Type
MS2MTBR0020T0300	0.2	3°	3	0.69	40	4	2	●	1
MS2MTB**R0020T0500**	0.2	5°	3	0.89	40	4	2	●	1
MS2MTB**R0020T0700**	0.2	7°	3	1.09	40	4	2	●	1
MS2MTB**R0020T1000**	0.2	10°	3	1.39	40	4	2	●	1
MS2MTB**R0030T0300**	0.3	3°	3	0.88	40	4	2	●	1
MS2MTB**R0030T0500**	0.3	5°	3	1.07	40	4	2	●	1
MS2MTB**R0030T0700**	0.3	7°	3	1.27	40	4	2	●	1
MS2MTB**R0030T1000**	0.3	10°	3	1.56	40	4	2	●	1
MS2MTB**R0050T0030**	0.5	30'	3	1.04	40	4	2	●	1
MS2MTB**R0050T0100**	0.5	1°	3	1.09	40	4	2	●	1
MS2MTB**R0050T0130**	0.5	1° 30'	3	1.13	40	4	2	●	1
MS2MTB**R0050T0200**	0.5	2°	3	1.18	40	4	2	●	1
MS2MTB**R0050T0300**	0.5	3°	3	1.26	40	4	2	●	1
MS2MTB**R0050T0500**	0.5	5°	3	1.44	40	4	2	●	1
MS2MTB**R0050T0700**	0.5	7°	6	2.36	45	4	2	●	1
MS2MTB**R0075T0030**	0.75	30'	6	1.59	40	4	2	●	1
MS2MTB**R0075T0100**	0.75	1°	6	1.68	40	4	2	●	1
MS2MTB**R0075T0130**	0.75	1° 30'	6	1.78	40	4	2	●	1
MS2MTB**R0075T0200**	0.75	2°	6	1.87	40	4	2	●	1
MS2MTB**R0075T0300**	0.75	3°	6	2.05	40	4	2	●	1
MS2MTB**R0075T0700**	0.75	7°	6	2.8	40	4	2	●	1
MS2MTB**R0100T0030**	1	30'	8	2.12	45	4	2	●	1
MS2MTB**R0100T0100**	1	1°	8	2.24	45	4	2	●	1
MS2MTB**R0100T0130**	1	1° 30'	8	2.37	45	4	2	●	1
MS2MTB**R0100T0200**	1	2°	8	2.49	45	4	2	●	1
MS2MTB**R0100T0300**	1	3°	8	2.74	45	4	2	●	1
MS2MTB**R0100T0400**	1	4°	8	2.98	45	4	2	●	1
MS2MTB**R0100T0500**	1	5°	8	3.23	45	4	2	●	1
MS2MTB**R0100T0700**	1	7°	8	3.73	50	6	2	●	1
MS2MTB**R0125T0030**	1.25	30'	10	2.65	45	4	2	●	1
MS2MTB**R0125T0100**	1.25	1°	10	2.81	45	4	2	●	1

● : Inventory maintained.

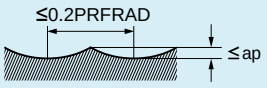
MS2MTB

Ball nose taper end mill, Medium cut length, 2 flute

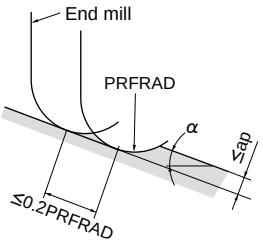
Unit : mm

Order Number	PRFRAD	B7	APMX	DC_2	LF	DCON	No. of Flutes	Stock	Type
MS2MTBR0125T0130	1.25	1° 30'	10	2.96	45	4	2	●	1
MS2MTB**R0125T0200**	1.25	2°	10	3.11	45	4	2	●	1
MS2MTB**R0125T0300**	1.25	3°	10	3.42	45	4	2	●	1
MS2MTB**R0125T0400**	1.25	4°	10	3.73	50	6	2	●	1
MS2MTB**R0125T0500**	1.25	5°	10	4.04	50	6	2	●	1
MS2MTB**R0125T0700**	1.25	7°	14.5	5.77	60	6	2	●	2
MS2MTB**R0150T0700**	1.5	7°	12.5	5.72	60	6	2	●	2

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.							Hardened steel (45−55HRC) AISI H13 etc.						
PRFRAD (mm)	α≤15°			α>15°			Depth of cut ap (mm)	α≤15°			α>15°			Depth of cut ap (mm)
	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)		Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	
R 0.1	40000	300	11.8	40000	250	9.8	0.003	40000	300	11.8	40000	250	9.8	0.003
R 0.15	40000	500	19.7	40000	350	13.8	0.007	40000	500	19.7	40000	350	13.8	0.007
R 0.2	40000	1600	63.0	40000	1200	47.2	0.02	40000	1300	51.2	40000	950	37.4	0.015
R 0.25	40000	2400	94.5	40000	1400	55.1	0.025	40000	1900	74.8	40000	1100	43.3	0.020
R 0.3	40000	3200	126.0	40000	1600	63.0	0.03	40000	2500	98.4	40000	1300	51.2	0.025
R 0.4	40000	4800	189.0	40000	2400	94.5	0.05	40000	4000	157.5	40000	1900	74.8	0.04
R 0.5	40000	5600	220.5	40000	3200	126.0	0.06	40000	5600	220.5	40000	3000	118.1	0.05
R 0.75	40000	6500	255.9	40000	4000	157.5	0.09	40000	6500	255.9	32000	3200	126.0	0.08
R 1	40000	6500	255.9	39000	4700	185.0	0.11	40000	6500	255.9	31000	3500	137.8	0.11
R 1.25	40000	7000	275.6	33000	4500	177.2	0.12	36000	6500	255.9	26000	3500	137.8	0.12
R 1.5	40000	7500	295.3	27000	4300	169.3	0.13	32000	6000	236.2	22000	3400	133.9	0.13
R 2	32000	7500	295.3	20000	3600	141.7	0.15	25000	6000	236.2	16000	2700	106.3	0.15
R 2.5	25000	6000	236.2	16000	2900	114.2	0.20	20000	5400	212.6	13000	2300	90.6	0.20
R 3	21000	5800	228.3	13000	2600	102.4	0.25	17000	4700	185.0	10000	2000	78.7	0.25
R 4	16000	4500	177.2	10000	2000	78.7	0.30	13000	3600	141.7	8000	1500	59.1	0.30
R 5	13000	3600	141.7	8000	1700	66.9	0.50	10000	2900	114.2	6400	1200	47.2	0.50
R 6	9000	2500	98.4	6000	1300	51.2	0.50	7200	2000	78.7	4800	1000	39.4	0.50
Depth of cut														

1) α is the inclination of the machined surface.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.



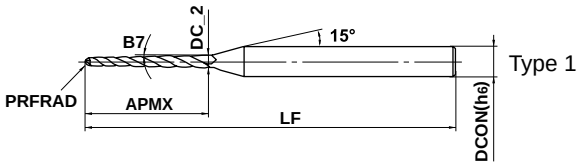
● : Inventory maintained. ★ : Inventory maintained in Japan.

MS4LTB

Ball nose, 4 flute, Taper, For rib milling

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





R	0.3≤PRFRAD≤1				
	±0.03				
	±5'				
h6	4≤DCON≤6				
	0 - 0.008				

● 4 flute taper ball nose end mill for rib milling.

Unit : mm

Order Number	PRFRAD	B7	APMX	DC_2	LF	DCON	No. of Flutes	Stock	Type
MS4LTBR0030T0030L04	0.3	30'	4	0.66	45	4	4	★	1
MS4LTBR0030T0030L06	0.3	30'	6	0.70	45	4	4	★	1
MS4LTBR0030T0100L04	0.3	1°	4	0.73	45	4	4	★	1
MS4LTBR0030T0100L06	0.3	1°	6	0.80	45	4	4	★	1
MS4LTBR0030T0130L04	0.3	1° 30'	4	0.79	45	4	4	★	1
MS4LTBR0030T0130L06	0.3	1° 30'	6	0.90	45	4	4	★	1
MS4LTBR0030T0200L04	0.3	2°	4	0.86	45	4	4	★	1
MS4LTBR0030T0200L06	0.3	2°	6	1.00	45	4	4	★	1
MS4LTBR0040T0030L06	0.4	30'	6	0.90	50	4	4	★	1
MS4LTBR0040T0030L08	0.4	30'	8	0.93	50	4	4	★	1
MS4LTBR0040T0030L10	0.4	30'	10	0.97	50	4	4	★	1
MS4LTBR0040T0100L06	0.4	1°	6	1.00	50	4	4	★	1
MS4LTBR0040T0100L08	0.4	1°	8	1.07	50	4	4	★	1
MS4LTBR0040T0100L10	0.4	1°	10	1.14	50	4	4	★	1
MS4LTBR0040T0130L06	0.4	1° 30'	6	1.09	50	4	4	★	1
MS4LTBR0040T0130L08	0.4	1° 30'	8	1.20	50	4	4	★	1
MS4LTBR0040T0130L10	0.4	1° 30'	10	1.30	50	4	4	★	1
MS4LTBR0040T0200L06	0.4	2°	6	1.19	50	4	4	★	1
MS4LTBR0040T0200L08	0.4	2°	8	1.33	50	4	4	★	1
MS4LTBR0040T0200L10	0.4	2°	10	1.47	50	4	4	★	1
MS4LTBR0050T0030L08	0.5	30'	8	1.13	50	4	4	★	1
MS4LTBR0050T0030L10	0.5	30'	10	1.17	50	4	4	★	1
MS4LTBR0050T0030L12	0.5	30'	12	1.20	50	4	4	★	1
MS4LTBR0050T0030L16	0.5	30'	16	1.27	55	4	4	★	1
MS4LTBR0050T0100L08	0.5	1°	8	1.26	50	4	4	★	1
MS4LTBR0050T0100L10	0.5	1°	10	1.33	50	4	4	★	1
MS4LTBR0050T0100L12	0.5	1°	12	1.40	50	4	4	★	1
MS4LTBR0050T0100L16	0.5	1°	16	1.54	55	4	4	★	1
MS4LTBR0050T0130L08	0.5	1° 30'	8	1.39	50	4	4	★	1
MS4LTBR0050T0130L10	0.5	1° 30'	10	1.50	50	4	4	★	1
MS4LTBR0050T0130L12	0.5	1° 30'	12	1.60	50	4	4	★	1

MS4LTB

Ball nose, 4 flute, Taper, For rib milling

Unit : mm

Order Number	PRFRAD	B7	APMX	DC_2	LF	DCON	No. of Flutes	Stock	Type
MS4LTBR0050T0130L16	0.5	1° 30'	16	1.81	55	4	4	★	1
MS4LTB**R0050T0200L08**	0.5	2°	8	1.52	50	4	4	★	1
MS4LTB**R0050T0200L10**	0.5	2°	10	1.66	50	4	4	★	1
MS4LTB**R0050T0200L12**	0.5	2°	12	1.80	50	4	4	★	1
MS4LTB**R0050T0200L16**	0.5	2°	16	2.08	55	4	4	★	1
MS4LTB**R0060T0030L08**	0.6	30'	8	1.33	50	4	4	★	1
MS4LTB**R0060T0030L10**	0.6	30'	10	1.36	50	4	4	★	1
MS4LTB**R0060T0030L12**	0.6	30'	12	1.40	50	4	4	★	1
MS4LTB**R0060T0030L16**	0.6	30'	16	1.47	55	4	4	★	1
MS4LTB**R0060T0100L08**	0.6	1°	8	1.46	50	4	4	★	1
MS4LTB**R0060T0100L10**	0.6	1°	10	1.53	50	4	4	★	1
MS4LTB**R0060T0100L12**	0.6	1°	12	1.60	50	4	4	★	1
MS4LTB**R0060T0100L16**	0.6	1°	16	1.74	55	4	4	★	1
MS4LTB**R0060T0130L08**	0.6	1° 30'	8	1.59	50	4	4	★	1
MS4LTB**R0060T0130L10**	0.6	1° 30'	10	1.69	50	4	4	★	1
MS4LTB**R0060T0130L12**	0.6	1° 30'	12	1.80	50	4	4	★	1
MS4LTB**R0060T0130L16**	0.6	1° 30'	16	2.01	55	4	4	★	1
MS4LTB**R0060T0200L08**	0.6	2°	8	1.72	50	4	4	★	1
MS4LTB**R0060T0200L10**	0.6	2°	10	1.86	50	4	4	★	1
MS4LTB**R0060T0200L12**	0.6	2°	12	2.00	50	4	4	★	1
MS4LTB**R0060T0200L16**	0.6	2°	16	2.28	55	4	4	★	1
MS4LTB**R0075T0030L08**	0.75	30'	8	1.63	50	4	4	★	1
MS4LTB**R0075T0030L10**	0.75	30'	10	1.66	50	4	4	★	1
MS4LTB**R0075T0030L12**	0.75	30'	12	1.70	50	4	4	★	1
MS4LTB**R0075T0030L16**	0.75	30'	16	1.77	55	4	4	★	1
MS4LTB**R0075T0030L20**	0.75	30'	20	1.84	60	4	4	★	1
MS4LTB**R0075T0100L08**	0.75	1°	8	1.75	50	4	4	★	1
MS4LTB**R0075T0100L10**	0.75	1°	10	1.82	50	4	4	★	1
MS4LTB**R0075T0100L12**	0.75	1°	12	1.89	50	4	4	★	1
MS4LTB**R0075T0100L16**	0.75	1°	16	2.03	55	4	4	★	1
MS4LTB**R0075T0100L20**	0.75	1°	20	2.17	60	4	4	★	1
MS4LTB**R0075T0130L08**	0.75	1° 30'	8	1.88	50	4	4	★	1
MS4LTB**R0075T0130L10**	0.75	1° 30'	10	1.98	50	4	4	★	1
MS4LTB**R0075T0130L12**	0.75	1° 30'	12	2.09	50	4	4	★	1
MS4LTB**R0075T0130L16**	0.75	1° 30'	16	2.30	55	4	4	★	1
MS4LTB**R0075T0130L20**	0.75	1° 30'	20	2.51	60	4	4	★	1
MS4LTB**R0075T0200L08**	0.75	2°	8	2.01	50	4	4	★	1
MS4LTB**R0075T0200L10**	0.75	2°	10	2.15	50	4	4	★	1
MS4LTB**R0075T0200L12**	0.75	2°	12	2.29	50	4	4	★	1
MS4LTB**R0075T0200L16**	0.75	2°	16	2.57	55	4	4	★	1
MS4LTB**R0075T0200L20**	0.75	2°	20	2.84	60	4	4	★	1
MS4LTB**R0090T0030L08**	0.9	30'	8	1.92	50	4	4	★	1
MS4LTB**R0090T0030L10**	0.9	30'	10	1.96	50	4	4	★	1
MS4LTB**R0090T0030L12**	0.9	30'	12	1.99	50	4	4	★	1
MS4LTB**R0090T0030L16**	0.9	30'	16	2.06	55	4	4	★	1
MS4LTB**R0090T0030L20**	0.9	30'	20	2.13	60	4	4	★	1
MS4LTB**R0090T0100L08**	0.9	1°	8	2.05	50	4	4	★	1
MS4LTB**R0090T0100L10**	0.9	1°	10	2.12	50	4	4	★	1
MS4LTB**R0090T0100L12**	0.9	1°	12	2.19	50	4	4	★	1
MS4LTB**R0090T0100L16**	0.9	1°	16	2.33	55	4	4	★	1
MS4LTB**R0090T0100L20**	0.9	1°	20	2.47	60	4	4	★	1

★ : Inventory maintained in Japan.

Unit : mm

Order Number	PRFRAD	B7	APMX	DC_2	LF	DCON	No. of Flutes	Stock	Type
MS4LTBR0090T0130L08	0.9	1° 30'	8	2.17	50	4	4	★	1
MS4LTB**R0090T0130L10**	0.9	1° 30'	10	2.28	50	4	4	★	1
MS4LTB**R0090T0130L12**	0.9	1° 30'	12	2.38	50	4	4	★	1
MS4LTB**R0090T0130L16**	0.9	1° 30'	16	2.59	55	4	4	★	1
MS4LTB**R0090T0130L20**	0.9	1° 30'	20	2.80	60	4	4	★	1
MS4LTB**R0090T0200L08**	0.9	2°	8	2.30	50	4	4	★	1
MS4LTB**R0090T0200L10**	0.9	2°	10	2.44	50	4	4	★	1
MS4LTB**R0090T0200L12**	0.9	2°	12	2.58	50	4	4	★	1
MS4LTB**R0090T0200L16**	0.9	2°	16	2.86	55	4	4	★	1
MS4LTB**R0090T0200L20**	0.9	2°	20	3.13	60	4	4	★	1
MS4LTB**R0100T0030L10**	1	30'	10	2.16	50	4	4	★	1
MS4LTB**R0100T0030L12**	1	30'	12	2.19	50	4	4	★	1
MS4LTB**R0100T0030L16**	1	30'	16	2.26	55	4	4	★	1
MS4LTB**R0100T0030L20**	1	30'	20	2.33	60	4	4	★	1
MS4LTB**R0100T0030L25**	1	30'	25	2.42	65	4	4	★	1
MS4LTB**R0100T0030L30**	1	30'	30	2.51	65	4	4	★	1
MS4LTB**R0100T0100L10**	1	1°	10	2.31	50	4	4	★	1
MS4LTB**R0100T0100L12**	1	1°	12	2.38	50	4	4	★	1
MS4LTB**R0100T0100L16**	1	1°	16	2.52	55	4	4	★	1
MS4LTB**R0100T0100L20**	1	1°	20	2.66	60	4	4	★	1
MS4LTB**R0100T0100L25**	1	1°	25	2.84	65	4	4	★	1
MS4LTB**R0100T0100L30**	1	1°	30	3.01	65	4	4	★	1
MS4LTB**R0100T0130L10**	1	1° 30'	10	2.47	50	4	4	★	1
MS4LTB**R0100T0130L12**	1	1° 30'	12	2.58	50	4	4	★	1
MS4LTB**R0100T0130L16**	1	1° 30'	16	2.79	55	4	4	★	1
MS4LTB**R0100T0130L20**	1	1° 30'	20	3.00	60	4	4	★	1
MS4LTB**R0100T0130L25**	1	1° 30'	25	3.26	65	6	4	★	1
MS4LTB**R0100T0130L30**	1	1° 30'	30	3.52	65	6	4	★	1
MS4LTB**R0100T0200L10**	1	2°	10	2.63	50	4	4	★	1
MS4LTB**R0100T0200L12**	1	2°	12	2.77	50	4	4	★	1
MS4LTB**R0100T0200L16**	1	2°	16	3.05	55	4	4	★	1
MS4LTB**R0100T0200L20**	1	2°	20	3.33	60	4	4	★	1
MS4LTB**R0100T0200L25**	1	2°	25	3.68	65	6	4	★	1
MS4LTB**R0100T0200L30**	1	2°	30	4.03	65	6	4	★	1

MS4LTB

Ball nose, 4 flute, Taper, For rib milling

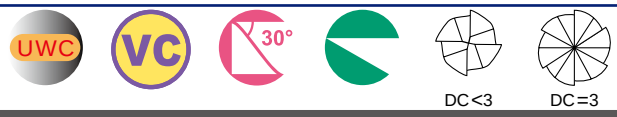
RECOMMENDED CUTTING CONDITIONS

Work material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.				Hardened steel (45—55HRC) AISI H13 etc.			
PRFRAD (mm)	**APMX** (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
R0.3	4	18000—32000	250—600	9.8—23.6	0.01	13000—24000	200—400	7.9—15.7	0.005
	6				0.007				0.004
R0.4	6	14000—24000	250—600	9.8—23.6	0.025	10000—18000	200—400	7.9—15.7	0.013
	8				0.02				0.01
	10				0.015				0.008
R0.5	8	11000—19000	300—800	11.8—31.5	0.025	8000—14000	200—500	7.9—19.7	0.013
	10				0.02				0.01
	12				0.018				0.009
	16				0.015				0.008
R0.6	8	9200—16000	300—800	11.8—31.5	0.035	6600—12000	200—500	7.9—19.7	0.018
	10				0.03				0.015
	12				0.027				0.013
	16				0.02				0.01
R0.75	8	7500—13000	300—800	11.8—31.5	0.05	5300—9500	200—500	7.9—19.7	0.025
	10				0.04				0.02
	12				0.035				0.018
	16				0.03				0.015
	20				0.02				0.01
R0.9	8	6200—11000	300—800	11.8—31.5	0.08	4400—8000	200—500	7.9—19.7	0.04
	10				0.07				0.035
	12				0.06				0.035
	16				0.05				0.03
	20				0.04				0.02
R1	10	5500—9500	300—800	11.8—31.5	0.08	4000—7200	200—500	7.9—19.7	0.045
	12				0.07				0.04
	16				0.05				0.03
	20				0.04				0.02
	25				0.03				0.015
	30				0.02				0.01

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

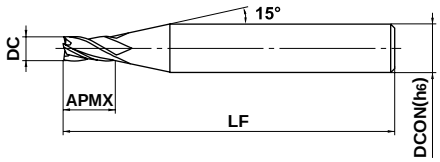
VCMDSC

End mill, Medium cut length, 4—6 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				





Type 1

0.5≤DC≤3				
0 - 0.020				
DCON=6				
0 - 0.008				

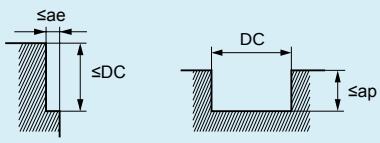
h6

● 4—6 flute end mill with sharp corner geometry for hardened steel milling.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VCMDSCD0050	0.5	1	45	6	4	★	1
VCMDSC**D0100**	1	2.5	45	6	4	★	1
VCMDSC**D0150**	1.5	4	45	6	4	★	1
VCMDSC**D0200**	2	6	45	6	4	★	1
VCMDSC**D0250**	2.5	8	45	6	4	★	1
VCMDSC**D0300**	3	8	45	6	6	★	1

RECOMMENDED CUTTING CONDITIONS

Work material	Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ae, ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ae, ap (mm)
0.5	40000	2000	78.7	0.03	30000	600	23.6	0.02
1	40000	3000	118.1	0.05	20000	900	35.4	0.03
1.5	40000	5000	196.9	0.08	18000	1100	43.3	0.05
2	40000	5600	220.5	0.10	16000	1300	51.2	0.06
3	34000	5600	220.5	0.15	13000	1600	63.0	0.09
Depth of cut								

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) The above condition are for shoulder milling. In slotting with over ϕ3, please set the revolution, feed rate and depth of cut at 20—40% of above value.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

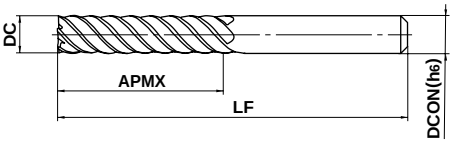
★ : **Inventory maintained in Japan.**

VCLD

End mill, Long cut length, 6 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				





Type 1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

h6

● 6 flute end mill with long cutting length for hardened steel milling.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VCLDD0600	6	26	70	6	6	★	1
VCLDD0800	8	36	90	8	6	★	1
VCLDD1000	10	46	100	10	6	★	1
VCLDD1200	12	56	110	12	6	★	1
VCLDD1600	16	66	130	16	6	★	1
VCLDD2000	20	76	140	20	6	★	1
VCLDD2500	25	92	180	25	6	★	1

RECOMMENDED CUTTING CONDITIONS

Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Hardened steel (45—55HRC) AISI H13 etc.			Hardened steel (55—62HRC) AISI D2 etc.			Hardened steel (62—70HRC) AISI W1, AISI M2 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
6	2100	450	17.7	1600	330	13.0	1300	240	9.4	1100	190	7.5
8	1600	430	16.9	1200	310	12.2	1000	230	9.1	800	170	6.7
10	1300	420	16.5	960	290	11.4	800	220	8.7	640	150	5.9
12	1100	380	15.0	800	260	10.2	660	200	7.9	530	140	5.5
16	800	310	12.2	600	220	8.7	500	160	6.3	400	120	4.7
20	640	270	10.6	480	190	7.5	400	140	5.5	320	110	4.3
25	510	230	9.1	380	160	6.3	320	120	4.7	260	90	3.5
Depth of cut	≤0.01DC 3DC—4DC						≤0.005DC 3DC—4DC					

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

★ : Inventory maintained in Japan.

VCMH

End mill, Medium cut length, 3—4 flute, High helix angle







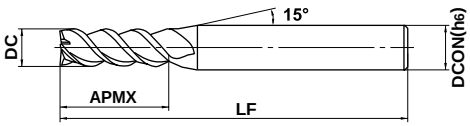


DC≤18

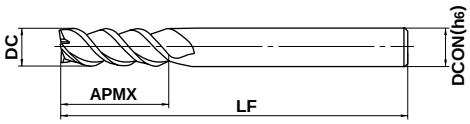
DC≥20

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	○		◎	◎		

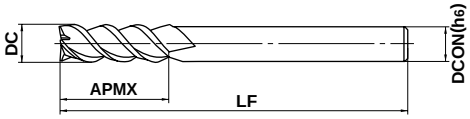




Type 1



Type 2



Type 3



DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● 3—4 flute end mill for milling difficult-to-cut and soft materials.

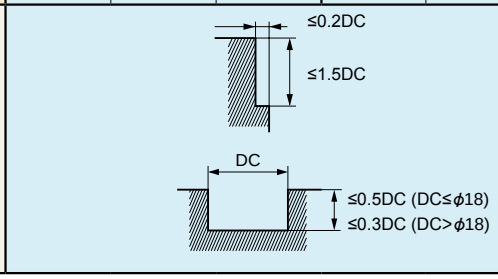
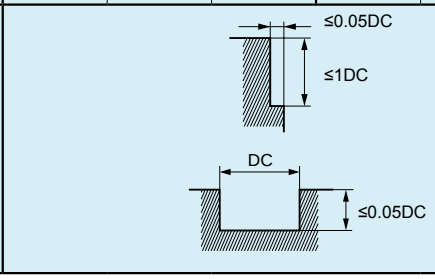
Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VCMHD0300	3	8	45	6	3	★	1
VCMH**D0400**	4	11	45	6	3	★	1
VCMH**D0500**	5	13	50	6	3	★	1
VCMH**D0600**	6	13	50	6	3	★	2
VCMH**D0700**	7	16	60	8	3	★	1
VCMH**D0800**	8	19	60	8	3	★	2
VCMH**D0900**	9	19	70	10	3	★	1
VCMH**D1000**	10	22	70	10	3	★	2
VCMH**D1100**	11	22	75	12	3	★	1
VCMH**D1200**	12	26	75	12	3	★	2
VCMH**D1300**	13	26	75	12	3	★	3
VCMH**D1400**	14	26	75	12	3	★	3
VCMH**D1500**	15	30	80	16	3	★	1
VCMH**D1600**	16	32	90	16	3	★	2
VCMH**D1800**	18	32	90	16	3	★	3
VCMH**D2000**	20	38	100	20	4	★	2
VCMH**D2500**	25	45	120	25	4	★	2

VCMH

End mill, Medium cut length, 3—4 flute, High helix angle

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45—55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
3	5300	130	5.1	4400	100	3.9	2400	50	2.0	1500	25	1.0
4	4400	220	8.7	3700	160	6.3	2000	80	3.1	1300	40	1.6
5	3600	260	10.2	3000	190	7.5	1700	100	3.9	1100	50	2.0
6	3200	280	11.0	2700	200	7.9	1500	100	3.9	1000	50	2.0
8	2400	300	11.8	2000	210	8.3	1200	110	4.3	800	45	1.8
10	1900	290	11.4	1600	210	8.3	960	115	4.5	640	45	1.8
12	1600	250	9.8	1300	170	6.7	800	95	3.7	530	40	1.6
16	1200	180	7.1	1000	130	5.1	600	70	2.8	400	30	1.2
18	1100	170	6.7	900	120	4.7	530	65	2.6	350	25	1.0
20	960	190	7.5	800	140	5.5	480	75	3.0	320	25	1.0
25	760	150	5.9	640	110	4.3	380	60	2.4	260	20	0.8
Depth of cut												

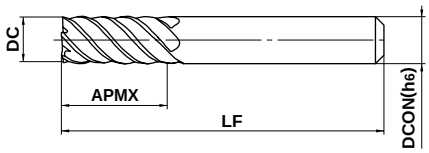
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) The above table shows cutting conditions for shoulder milling. For slotting, please set the revolution at 80 — 100% and the feed rate at 60—80% of the table figure. Please set the revolution rate at 60% and the feed rate at 40% when slotting austenitic stainless steels.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VC6MH

End mill, Medium cut length, 6 flute, High helix angle

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		◎	◎		





Type 1

DC≤12	DC>12			
0 - 0.02	0 - 0.03			
DCON=6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

h6

● 6 flute end mill for milling difficult-to-cut and soft materials.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VC6MHD0600	6	13	50	6	6	★	1
VC6MH**D0800**	8	19	60	8	6	★	1
VC6MH**D1000**	10	22	70	10	6	★	1
VC6MH**D1200**	12	26	75	12	6	★	1
VC6MH**D1600**	16	32	90	16	6	★	1
VC6MH**D2000**	20	38	100	20	6	★	1
VC6MH**D2500**	25	45	120	25	6	★	1

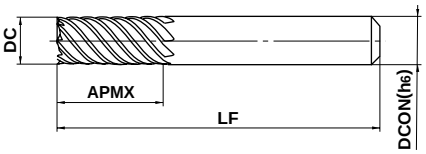
★ : Inventory maintained in Japan.

VC8MH

End mill, Medium cut length, 8 flute, High helix angle

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		◎	◎		





Type 1

20≤DC≤25					
0 - 0.03					
20≤DCON≤25					
0 - 0.013					

h6

● 8 flute end mill for milling difficult-to-cut and soft materials.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VC8MHD2000	20	38	100	20	8	★	1
VC8MHD2500	25	45	120	25	8	★	1

VC6MH

End mill, Medium cut length, 6 flute, High helix angle

VC8MH

End mill, Medium cut length, 8 flute, High helix angle

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
6	10600	2900	114.2	8000	2000	78.7	4200	900	35.4	2100	320	12.6
8	8000	2900	114.2	6000	2000	78.7	3200	900	35.4	1600	300	11.8
10	6400	2700	106.3	4800	2000	78.7	2500	870	34.3	1300	260	10.2
12	5300	2700	106.3	4000	2000	78.7	2100	830	32.7	1100	230	9.1
16	4000	2200	86.6	3000	1600	63.0	1600	740	29.1	800	180	7.1
20	3200	1900	74.8	2400	1400	55.1	1300	710	28.0	640	150	5.9
25	2500	1600	63.0	1900	1200	47.2	1000	560	22.0	510	120	4.7
Depth of cut	≤0.1DC ≤1DC			≤0.05DC ≤1DC								

1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

● : Inventory maintained. ★ : Inventory maintained in Japan.

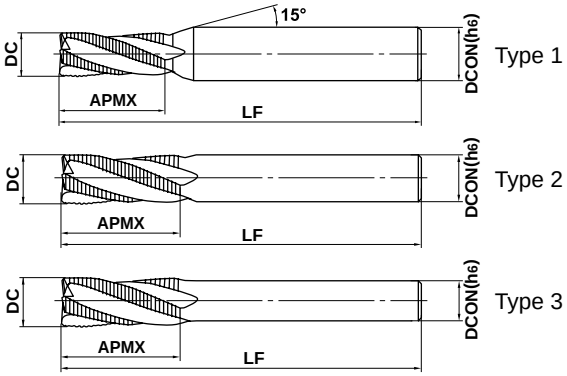
VCSFPR

Roughing end mill, Short cut length, 3—4 flute

UWC VC 20° DC<8 DC≥8

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		◎	◎		





h6

DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● 3—4 flute roughing end mill for general steel, difficult-to-cut and hardened materials.

Unit : mm

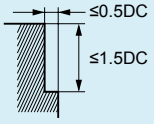
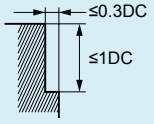
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VCSFPRD0300	3	6	50	6	3	★	1
VCSFPR**D0400**	4	8	50	6	3	★	1
VCSFPR**D0500**	5	10	50	6	3	●	1
VCSFPR**D0600**	6	12	50	6	3	●	2
VCSFPR**D0700**	7	17	60	8	3	●	1
VCSFPR**D0800**	8	17	60	8	4	●	2
VCSFPR**D0900**	9	22	70	10	4	●	1
VCSFPR**D1000S08**	10	22	90	8	4	★	3
VCSFPR**D1000**	10	22	70	10	4	●	2
VCSFPR**D1200S10**	12	27	100	10	4	★	3
VCSFPR**D1200**	12	27	75	12	4	●	2
VCSFPR**D1400**	14	27	75	12	4	●	3
VCSFPR**D1600**	16	33	90	16	4	●	2
VCSFPR**D1800**	18	33	90	16	4	●	3
VCSFPR**D2000**	20	38	100	20	4	●	2

VCSFPR

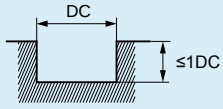
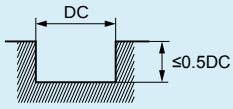
Roughing end mill, Short cut length, 3—4 flute

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45—55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
3	16000	960	37.8	13000	640	25.2	6400	260	10.2	5300	100	3.9	4200	70	2.8
4	12000	960	37.8	9500	640	25.2	4800	260	10.2	4000	100	3.9	3200	70	2.8
5	9500	960	37.8	7600	640	25.2	3800	260	10.2	3200	100	3.9	2500	70	2.8
6	8000	960	37.8	6400	680	26.8	3200	290	11.4	2700	110	4.3	2100	75	3.0
8	6000	1050	41.3	4800	760	29.9	2400	340	13.4	2000	140	5.5	1600	95	3.7
10	4800	1050	41.3	3800	760	29.9	1900	340	13.4	1600	150	5.9	1300	105	4.1
12	4000	960	37.8	3200	700	27.6	1600	320	12.6	1300	150	5.9	1100	110	4.3
16	3000	840	33.1	2400	620	24.4	1200	300	11.8	1000	150	5.9	800	110	4.3
20	2400	760	29.9	1900	560	22.0	1000	300	11.8	800	140	5.5	600	100	3.9
Depth of cut															

Slotting

Work material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45—55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
3	13000	720	28.3	11000	480	18.9	4800	190	7.5	3200	50	2.0	2100	25	1.0
4	9500	720	28.3	8000	480	18.9	3600	190	7.5	2400	50	2.0	1600	25	1.0
5	7600	720	28.3	6400	480	18.9	3200	190	7.5	1900	50	2.0	1300	25	1.0
6	6400	720	28.3	5300	480	18.9	2700	200	7.9	1600	55	2.2	1100	30	1.2
8	4800	800	31.5	4000	520	20.5	2000	220	8.7	1200	70	2.8	800	35	1.4
10	3800	800	31.5	3200	520	20.5	1600	220	8.7	1000	70	2.8	600	35	1.4
12	3200	750	29.5	2700	520	20.5	1300	210	8.3	800	75	3.0	500	40	1.6
16	2400	620	24.4	2000	450	17.7	1000	180	7.1	600	75	3.0	400	45	1.8
20	1900	540	21.3	1600	400	15.7	800	160	6.3	500	70	2.8	300	40	1.6
Depth of cut															

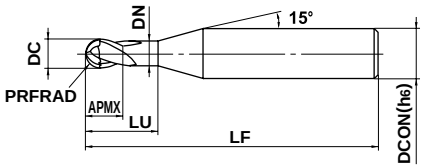
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VC2ESB

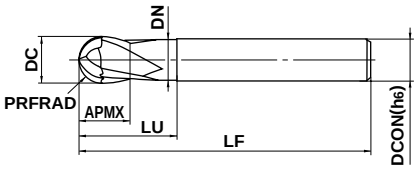
Ball nose, Extra short cut length, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	○	○	○		





Type 1



Type 2

R					
	0.15≤PRFRAD≤6				
	±0.01				
	0.3≤DC≤12				
	0 - 0.020				
h6	4≤DCON≤6	8≤DCON≤10	DCON=12		
	0 - 0.008	0 - 0.009	0 - 0.011		

● The optimal series for milling in compact machining center.

Unit : mm

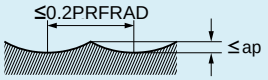
Order Number	PRFRAD	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VC2ESBR0015N006	0.15	0.3	0.3	0.6	0.27	30	4	2	●	1
VC2ESB**R0020N008**	0.2	0.4	0.4	0.8	0.36	30	4	2	●	1
VC2ESB**R0030N012**	0.3	0.6	0.6	1.2	0.56	30	4	2	●	1
VC2ESB**R0040N016**	0.4	0.8	0.8	1.6	0.76	30	4	2	●	1
VC2ESB**R0050**	0.5	1	1	—	—	30	4	2	●	1
VC2ESB**R0050N025**	0.5	1	1	2.5	0.94	30	4	2	●	1
VC2ESB**R0075**	0.75	1.5	1.5	—	—	30	4	2	●	1
VC2ESB**R0075N040**	0.75	1.5	1.5	4	1.44	30	4	2	●	1
VC2ESB**R0100**	1	2	2	—	—	40	6	2	●	1
VC2ESB**R0100N060**	1	2	2	6	1.9	40	6	2	●	1
VC2ESB**R0150**	1.5	3	3	—	—	40	6	2	●	1
VC2ESB**R0150N080**	1.5	3	3	8	2.9	40	6	2	●	1
VC2ESB**R0200**	2	4	4	—	—	40	6	2	●	1
VC2ESB**R0200N080**	2	4	4	8	3.9	40	6	2	●	1
VC2ESB**R0250**	2.5	5	5	—	—	40	6	2	●	1
VC2ESB**R0250N120**	2.5	5	5	12	4.9	40	6	2	●	1
VC2ESB**R0300**	3	6	6	—	—	40	6	2	●	2
VC2ESB**R0300N130**	3	6	6	13	5.85	40	6	2	●	2
VC2ESB**R0350**	3.5	7	7	—	—	50	6	2	●	1
VC2ESB**R0400**	4	8	8	—	—	50	6	2	●	2
VC2ESB**R0500**	5	10	10	—	—	60	10	2	●	2
VC2ESB**R0600**	6	12	12	—	—	65	12	2	●	2

● : Inventory maintained.

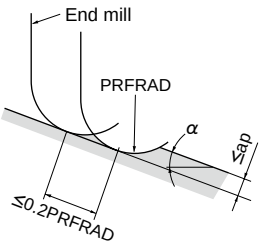
VC2ESB

Ball nose, Extra short cut length, 2 flute

RECOMMENDED CUTTING CONDITIONS

Work material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.							Hardened steel (45−55HRC) AISI H13 etc.						
PRFRAD (mm)	α≤15°			α>15°			Depth of cut ap (mm)	α≤15°			α>15°			Depth of cut ap (mm)
	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed			Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		
		(mm/min)	(IPM)		(mm/min)	(IPM)			(mm/min)	(IPM)		(mm/min)	(IPM)	
R 0.5	40000	5600	220.5	40000	3200	126.0	0.06	40000	5600	220.5	40000	3000	118.1	0.06
R 0.75	40000	6500	256.0	40000	3200	126.0	0.09	40000	6500	256.0	32000	3200	126.0	0.09
R 1	40000	6500	256.0	39000	3800	149.6	0.11	40000	6500	256.0	31000	3500	137.8	0.11
R 1.5	40000	7500	295.3	27000	4300	169.3	0.13	32000	6000	236.2	22000	3400	133.9	0.13
R 2	32000	7500	295.3	20000	3600	141.7	0.15	25000	6000	236.2	16000	2700	106.3	0.15
R 2.5	25000	6000	236.2	16000	2900	114.2	0.20	20000	5400	212.6	13000	2300	90.6	0.20
R 3	21000	5800	228.3	13000	2600	102.4	0.25	17000	4700	185.0	10000	2000	78.7	0.25
R 4	16000	4500	177.2	10000	2000	78.7	0.30	13000	3600	141.7	8000	1500	59.1	0.30
R 5	13000	3600	141.7	8000	1700	66.9	0.50	10000	2900	114.2	6400	1200	47.2	0.50
R 6	9000	2500	98.5	6000	1300	51.2	0.50	7200	2000	78.7	4800	1000	39.4	0.50
Depth of cut														

1) α is the inclination of the machined surface.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.



VC2PSB MIRACLE NOVA

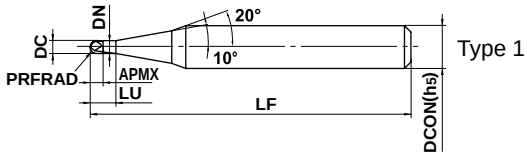
Ball nose, Short cut length, 2 flute, High precision

UWC VC 0° 30°

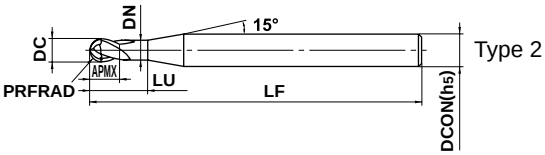
PRFRAD<0.5 PRFRAD≥0.5 PRFRAD<0.5 PRFRAD≥0.5

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎		○	○		

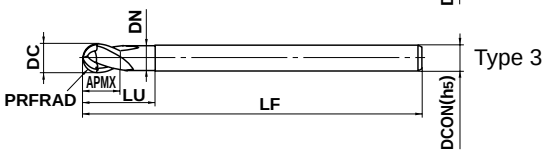




Type 1



Type 2



Type 3

R					
0.05≤PRFRAD≤6					
±0.005					
0.1≤DC≤12					
0 - 0.01					
h5	DCON=6	8≤DCON≤10	DCON=12		
	0 - 0.005	0 - 0.006	0 - 0.008		

● MIRACLE NOVA, radial tolerance of ±0.005mm, diameter tolerance 0– -0.01mm and a shank tolerance of h5.

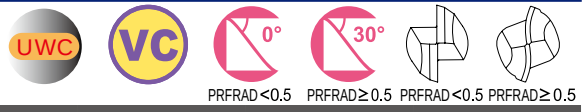
Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VC2PSBR0005	0.05	0.1	0.2	—	—	50	6	2	●	1
VC2PSB**R0010**	0.1	0.2	0.2	0.5	0.17	50	6	2	●	1
VC2PSB**R0015**	0.15	0.3	0.3	0.8	0.27	50	6	2	●	1
VC2PSB**R0020**	0.2	0.4	0.4	1	0.36	50	6	2	●	1
VC2PSB**R0025**	0.25	0.5	0.5	1.3	0.46	50	6	2	●	1
VC2PSB**R0030**	0.3	0.6	0.6	1.5	0.56	50	6	2	●	1
VC2PSB**R0035**	0.35	0.7	0.7	1.8	0.66	50	6	2	●	1
VC2PSB**R0040**	0.4	0.8	0.8	2	0.76	50	6	2	●	1
VC2PSB**R0045**	0.45	0.9	0.9	2.3	0.86	50	6	2	●	1
VC2PSB**R0050**	0.5	1	1.5	2.5	0.94	50	6	2	●	2
VC2PSB**R0060**	0.6	1.2	1.8	3	1.14	50	6	2	★	2
VC2PSB**R0070**	0.7	1.4	2.1	3.5	1.34	50	6	2	★	2
VC2PSB**R0075**	0.75	1.5	2.3	3.8	1.44	50	6	2	●	2
VC2PSB**R0080**	0.8	1.6	2.4	4	1.54	50	6	2	★	2
VC2PSB**R0090**	0.9	1.8	2.7	4.5	1.74	50	6	2	★	2
VC2PSB**R0100**	1	2	3	5	1.90	50	6	2	●	2
VC2PSB**R0150**	1.5	3	4.5	7.5	2.90	70	6	2	●	2
VC2PSB**R0200**	2	4	6	10	3.90	70	6	2	●	2
VC2PSB**R0250**	2.5	5	7.5	12.5	4.90	80	6	2	●	2
VC2PSB**R0300**	3	6	9	15	5.85	80	6	2	●	3
VC2PSB**R0400**	4	8	12	20	7.85	90	8	2	●	3
VC2PSB**R0500**	5	10	15	25	9.70	100	10	2	●	3
VC2PSB**R0600**	6	12	18	30	11.70	110	12	2	●	3

● : Inventory maintained. ★ : Inventory maintained in Japan.

VC2PSBP MIRACLE NOVA

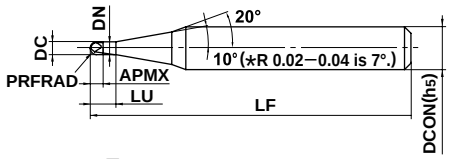
Ball nose, Short cut length, 2 flute, Ultra high precision



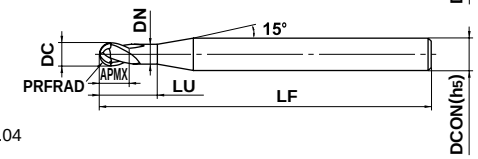
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎		○	○		



Inspection reports regarding the R accuracy of the VC2PSBP are supplied with the tool.

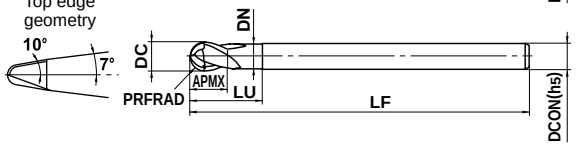


Type 1



Type 2

R0.02−0.04
Top edge geometry



Type 3

R				
0.02≤PRFRAD≤6				
±0.002				
0.1≤DC≤12				
0 - 0.01				
h5	DCON=6	8≤DCON≤10	DCON=12	
	0 - 0.005	0 - 0.006	0 - 0.008	

● MIRACLE NOVA, radial tolerance of ±0.002mm, diameter tolerance 0− -0.01mm and a shank tolerance of h5.

Unit : mm

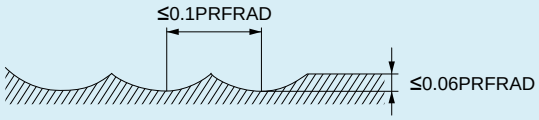
Order Number	PRFRAD	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VC2PSBPR0002	0.02	—	0.06	—	—	50	6	2	□	1
VC2PSBP**R0003**	0.03	—	0.09	—	—	50	6	2	□	1
VC2PSBP**R0004**	0.04	—	0.12	—	—	50	6	2	□	1
VC2PSBP**R0005**	0.05	0.1	0.2	—	—	50	6	2	★	1
VC2PSBP**R0010**	0.1	0.2	0.2	0.5	0.17	50	6	2	★	1
VC2PSBP**R0015**	0.15	0.3	0.3	0.8	0.27	50	6	2	★	1
VC2PSBP**R0020**	0.2	0.4	0.4	1	0.36	50	6	2	★	1
VC2PSBP**R0025**	0.25	0.5	0.5	1.3	0.46	50	6	2	★	1
VC2PSBP**R0030**	0.3	0.6	0.6	1.5	0.56	50	6	2	★	1
VC2PSBP**R0035**	0.35	0.7	0.7	1.8	0.66	50	6	2	★	1
VC2PSBP**R0040**	0.4	0.8	0.8	2	0.76	50	6	2	★	1
VC2PSBP**R0045**	0.45	0.9	0.9	2.3	0.86	50	6	2	★	1
VC2PSBP**R0050**	0.5	1	1.5	2.5	0.94	50	6	2	★	2
VC2PSBP**R0060**	0.6	1.2	1.8	3	1.14	50	6	2	★	2
VC2PSBP**R0070**	0.7	1.4	2.1	3.5	1.34	50	6	2	★	2
VC2PSBP**R0075**	0.75	1.5	2.3	3.8	1.44	50	6	2	★	2
VC2PSBP**R0080**	0.8	1.6	2.4	4	1.54	50	6	2	★	2
VC2PSBP**R0090**	0.9	1.8	2.7	4.5	1.74	50	6	2	★	2
VC2PSBP**R0100**	1	2	3	5	1.9	50	6	2	★	2
VC2PSBP**R0150**	1.5	3	4.5	7.5	2.9	70	6	2	★	2
VC2PSBP**R0200**	2	4	6	10	3.9	70	6	2	★	2
VC2PSBP**R0250**	2.5	5	7.5	12.5	4.9	80	6	2	★	2
VC2PSBP**R0300**	3	6	9	15	5.85	80	6	2	★	3
VC2PSBP**R0400**	4	8	12	20	7.85	90	8	2	★	3
VC2PSBP**R0500**	5	10	15	25	9.7	100	10	2	★	3
VC2PSBP**R0600**	6	12	18	30	11.7	110	12	2	★	3

(Inspection reports with VC2PSBP.)

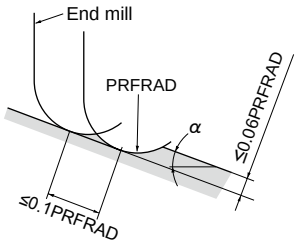
ULTRA HIGH PRECISION
[±0.002mm]

★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.

RECOMMENDED CUTTING CONDITIONS

Work material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.						Hardened steel (45—55HRC) AISI H13 etc.					
PRFRAD (mm)	α≤15°			α>15°			α≤15°			α>15°		
	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed	
		(mm/min)	(IPM)		(mm/min)	(IPM)		(mm/min)	(IPM)		(mm/min)	(IPM)
R0.05	40000	200	7.9	—	—	—	40000	170	6.7	—	—	—
R0.1	40000	600	23.6	40000	400	15.7	40000	600	23.6	40000	400	15.7
R0.15	40000	900	35.4	40000	600	23.6	40000	900	35.4	40000	600	23.6
R0.2	40000	1000	39.4	40000	700	27.6	40000	1000	39.4	40000	700	27.6
R0.25	40000	1500	59.1	40000	1000	39.4	40000	1500	59.1	40000	1000	39.4
R0.3	40000	2000	78.7	40000	1500	59.1	40000	2000	78.7	40000	1500	59.1
R0.35	40000	2800	110.2	40000	2100	82.7	40000	2800	110.2	37000	1800	70.9
R0.4	40000	2800	110.2	40000	2100	82.7	40000	2800	110.2	35000	1800	70.9
R0.45	40000	3200	126.0	38000	2200	86.6	38000	3000	118.1	32000	1800	70.9
R0.5	40000	3200	126.0	35000	2200	86.6	35000	3000	118.1	30000	1800	70.9
R0.75	40000	3600	141.7	30000	2300	90.6	32000	3000	118.1	25000	1800	70.9
R1	35000	3500	137.8	25000	2200	86.6	28000	2800	110.2	20000	1700	66.9
R1.5	30000	3400	133.9	23000	2200	86.6	24000	2600	102.4	16000	1500	59.1
R2	25000	3400	133.9	20000	2200	86.6	20000	2600	102.4	14000	1500	59.1
R2.5	23000	3400	133.9	17000	2200	86.6	18000	2600	102.4	12000	1500	59.1
R3	20000	3400	133.9	15000	2200	86.6	16000	2600	102.4	10000	1400	55.1
R4	15000	3000	118.1	12500	2000	78.7	10000	2000	78.7	7500	1200	47.2
R5	12000	3000	118.1	10000	2000	78.7	8000	2000	78.7	6000	1200	47.2
R6	10000	2600	102.4	8300	1800	70.9	6600	1700	66.9	5000	1100	43.3
Depth of cut												

1) α is the inclination of the machined surface.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

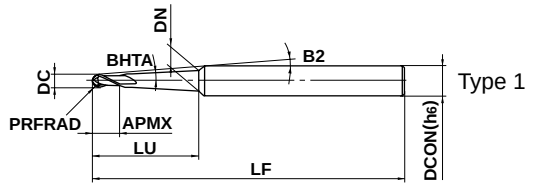


VCXB

Ball nose, 2 flute, Taper neck

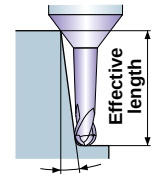
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	○	○	○		

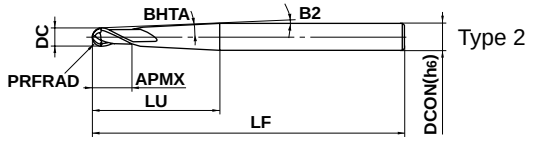




Type 1

Effective length for inclined angle





Type 2

R			
0.5≤PRFRAD≤6			
±0.01			
1≤DC≤12			
0 - 0.020			
h6 DCON=6	8≤DCON≤10	12≤DCON≤16	
0 - 0.008	0 - 0.009	0 - 0.011	

● Ball nose end mill with taper neck.

Unit : mm

Order Number	PRFRAD	DC	BHTA	APMX	LU	B2	DN	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 1°	2°	3°
VCXBR0050T0100L016	0.5	1	1°	2	16	6.6°	1.38	50	6	2	●	1	16.2	17	18
VCXBR0050T0100L021	0.5	1	1°	2	21	5.4°	1.56	60	6	2	●	1	21.2	22.3	23.5
VCXBR0050T0100L026	0.5	1	1°	2	26	4.6°	1.73	70	6	2	●	1	26.2	27.6	29.1
VCXBR0050T0130	0.5	1	1° 30'	2	23	5.1°	1.97	60	6	2	●	1	—	23.9	25.2
VCXBR0050T0300	0.5	1	3°	2	42	3.4°	5.08	80	6	2	●	1	—	—	42.4
VCXBR0050T0500	0.5	1	5°	2	23	5.8°	4.46	60	6	2	●	1	—	—	—
VCXBR0100T0100L021	1	2	1°	4	21	4.6°	2.43	50	6	2	●	1	21.3	22.4	23.6
VCXBR0100T0100L031	1	2	1°	4	31	3.4°	2.78	60	6	2	●	1	31.3	33	34.8
VCXBR0100T0100L041	1	2	1°	4	41	2.7°	3.13	70	6	2	●	1	41.3	43.5	★
VCXBR0100T0130	1	2	1° 30'	4	23	4.4°	2.8	60	6	2	●	1	—	24.1	25.4
VCXBR0100T0300	1	2	3°	4	41	2.9°	5.71	80	6	2	●	1	—	—	★
VCXBR0100T0500	1	2	5°	4	23	4.9°	5.02	60	6	2	●	1	—	—	—
VCXBR0150T0100L031	1.5	3	1°	6	31	2.7°	3.71	60	6	2	●	1	31.4	33	★
VCXBR0150T0100L041	1.5	3	1°	6	41	2.1°	4.06	70	6	2	●	1	41.4	43.5	★
VCXBR0150T0100L051	1.5	3	1°	6	51	1.7°	4.41	80	6	2	●	1	51.4	★	★
VCXBR0150T0130	1.5	3	1° 30'	6	52	1.7°	5.21	90	6	2	●	1	—	★	★
VCXBR0150T0300	1.5	3	3°	6	32	2.8°	5.56	70	6	2	●	1	—	—	★
VCXBR0200T0100L036	2	4	1°	8	36	1.7°	4.81	70	6	2	●	1	36.5	★	★
VCXBR0200T0100L046	2	4	1°	8	46	1.3°	5.16	80	6	2	●	1	46.5	★	★
VCXBR0200T0100L060	2	4	1°	8	60	1°	5.65	90	6	2	●	1	60.5	★	★
VCXBR0200T0130	2	4	1° 30'	8	49	1.3°	5.95	90	6	2	●	1	—	★	★
VCXBR0200T0300	2	4	3°	8	28	2.2°	—	70	6	2	●	2	—	—	★
VCXBR0250T0100L036	2.5	5	1°	10	36	0.9°	5.71	80	6	2	●	1	★	★	★
VCXBR0250T0100L065	2.5	5	1°	10	65	1.4°	6.72	110	8	2	●	1	65.6	★	★
VCXBR0250T0130	2.5	5	1° 30'	10	61	1.5°	7.42	110	8	2	★	1	—	★	★
VCXBR0250T0300	2.5	5	3°	10	41	2.3°	—	90	8	2	★	2	—	—	★
VCXBR0300T0100L051	3	6	1°	12	51	1.2°	7.11	90	8	2	●	1	51.8	★	★
VCXBR0300T0100L065	3	6	1°	12	65	1°	7.6	110	8	2	●	1	65.8	★	★
VCXBR0300T0100L092	3	6	1°	12	92	1.3°	8.54	140	10	2	●	1	92.8	★	★
VCXBR0300T0130	3	6	1° 30'	12	53	1.2°	7.85	110	8	2	●	1	—	★	★
VCXBR0300T0300	3	6	3°	12	34	1.9°	—	90	8	2	●	2	—	—	★

★ No interference

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	PRFRAD	DC	BHTA	APMX	LU	B2	DN	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle		
													1°	2°	3°
VCXBR0400T0100L068	4	8	1°	14	68	0.9°	9.64	110	10	2	★	1	*	*	*
VCXBR0400T0100L092	4	8	1°	14	92	1.3°	10.47	140	12	2	★	1	92.8	*	*
VCXBR0400T0130	4	8	1° 30'	14	55	1.2°	9.85	120	10	2	★	1	—	*	*
VCXBR0400T0300	4	8	3°	14	36	1.8°	—	100	10	2	★	2	—	—	*
VCXBR0500T0100L070	5	10	1°	18	70	0.9°	11.76	130	12	2	★	1	*	*	*
VCXBR0500T0100L100	5	10	1°	18	100	1.8°	12.8	160	16	2	★	1	100.7	*	*
VCXBR0500T0130	5	10	1° 30'	18	59	1.1°	—	130	12	2	★	2	—	*	*
VCXBR0500T0300	5	10	3°	18	40	1.7°	—	110	12	2	★	2	—	—	*
VCXBR0600T0100L070	6	12	1°	22	70	1.8°	13.62	140	16	2	★	1	70.9	*	*
VCXBR0600T0100L100	6	12	1°	22	100	1.2°	14.66	160	16	2	★	1	100.9	*	*
VCXBR0600T0130	6	12	1° 30'	22	83	1.5°	15.08	160	16	2	★	1	—	*	*
VCXBR0600T0300	6	12	3°	22	63	2.1°	—	140	16	2	★	2	—	—	*

* No interference

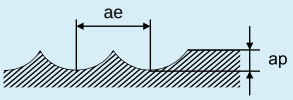
VCXB

Ball nose, 2 flute, Taper neck

RECOMMENDED CUTTING CONDITIONS

Work material					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Hardened steel (45—55HRC) AISI H13 etc.		
PRFRAD (mm)	**DN**	**LU** (mm)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
R0.5	1°	16	0.02	0.1	22000	530	20.9	12000	230	9.1
	1°	21	0.01							
	1°	26	0.01							
	1° 30'	23	0.02							
	3°	42	0.05							
	5°	23	0.05							
R1	1°	21	0.05	0.2	18000	570	22.4	10000	260	10.2
	1°	31	0.04							
	1°	41	0.03							
	1° 30'	23	0.1							
	3°	41	0.1							
	5°	23	0.1							
R2	1°	36	0.2	0.8	14000	670	26.4	6000	200	7.9
	1°	46	0.15							
	1°	60	0.1							
	1° 30'	49	0.2							
	3°	28	0.2							
R3	1°	51	0.3	1.2	10000	840	33.1	5000	220	8.7
	1°	65	0.2							
	1°	92	0.1							
	1° 30'	53	0.3							
	3°	34	0.3							
R4	1° 30'	55	0.4	1.6	8000	840	33.1	4000	270	10.6
	3°	36	0.4							
R5	1°	70	0.4	2	6000	840	33.1	3000	310	12.2
	1°	100	0.3							
	1° 30'	59	0.5							
	3°	40	0.5							
R6	1°	70	0.6	2.4	5000	900	35.4	2500	340	13.4
	1°	100	0.4							
	1° 30'	83	0.6							
	3°	63	0.6							

Depth of cut



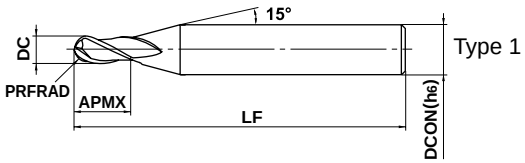
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VC3MB

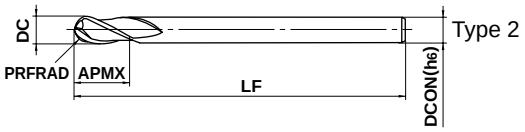
Ball nose end mill, Medium cut length, 3 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	○	○	○		





Type 1



Type 2

R				
PRFRAD≤6	PRFRAD≥8			
±0.01	±0.02			
DC≤12	DC>12			
0 - 0.020	0 - 0.030			
h6				
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● 3 flute ball nose end mill for efficient machining.

Unit : mm

Order Number	PRFRAD	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VC3MBR0100	1	2	6	60	6	3	●	1
VC3MB**R0150**	1.5	3	8	70	6	3	●	1
VC3MB**R0200**	2	4	8	70	6	3	●	1
VC3MB**R0250**	2.5	5	12	80	6	3	●	1
VC3MB**R0300**	3	6	12	80	6	3	●	2
VC3MB**R0400**	4	8	14	90	8	3	●	2
VC3MB**R0500**	5	10	18	100	10	3	●	2
VC3MB**R0600**	6	12	22	110	12	3	●	2
VC3MB**R0800**	8	16	30	140	16	3	●	2
VC3MB**R1000**	10	20	38	160	20	3	●	2

● : Inventory maintained.

VC3MB

Ball nose end mill, Medium cut length, 3 flute

RECOMMENDED CUTTING CONDITIONS

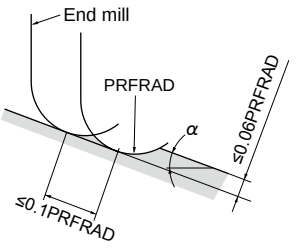
Roughing

Work material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.						Hardened steel (45−55HRC) AISI H13 etc.					
PRFRAD (mm)	α≤15°			α>15°			α≤15°			α>15°		
	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
R1	32000	3000	118.1	25000	1170	46.1	18000	1440	56.7	16000	640	25.2
R2	18500	3700	145.7	14500	1460	57.5	11000	1760	69.3	9200	740	29.1
R3	13000	4000	157.5	10000	1500	59.1	7700	1920	75.6	6400	800	31.5
R4	10000	5000	196.9	8000	2000	78.7	6000	2300	90.6	4800	920	36.2
R5	8000	5000	196.9	6500	2000	78.7	4800	2200	86.6	3800	870	34.3
R6	6600	4600	181.1	5300	1800	70.9	4000	2100	82.7	3200	840	33.1
R8	5000	4000	157.5	4000	1600	63.0	3000	1700	66.9	2400	680	26.8
R10	4000	3600	141.7	3200	1440	56.7	2400	1400	55.1	1900	550	21.7
Depth of cut	≤0.5PRFRAD ≤0.2PRFRAD											

Finishing

Work material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.						Hardened steel (45−55HRC) AISI H13 etc.					
PRFRAD (mm)	α≤15°			α>15°			α≤15°			α>15°		
	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
R1	32000	3200	126.0	32000	1500	59.1	25000	2000	78.7	20000	800	31.5
R2	25500	5000	196.9	20000	2000	78.7	17000	2700	106.3	13000	1000	39.4
R3	20000	6100	240.2	15000	2200	86.6	13000	3200	126.0	10000	1200	47.2
R4	15000	7500	295.3	11000	2700	106.3	10000	3800	149.6	7500	1400	55.1
R5	12000	7500	295.3	9000	2700	106.3	8000	3700	145.7	6000	1400	55.1
R6	10000	7000	275.6	7500	2500	98.4	6600	3500	137.8	5000	1300	51.2
R8	7500	6000	236.2	5600	2200	86.6	5000	2800	110.2	3700	1000	39.4
R10	6000	5400	212.6	4500	2000	78.7	4000	2300	90.6	3000	900	35.4
Depth of cut	≤0.1PRFRAD ≤0.06PRFRAD											

1) α is the inclination of the machined surface.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.



VC4MB

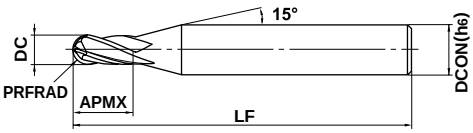
Ball nose, Medium cut length, 4 flute

UWC VC 20° 30°

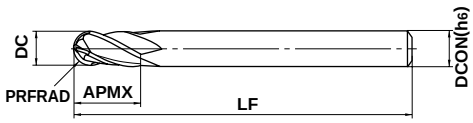
PRFRAD<3 PRFRAD≥3

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎	○	○		

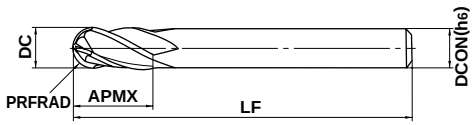




Type 1



Type 2



Type 3

R

PRFRAD≤6	PRFRAD≥7			
±0.01	±0.02			

DC≤12	DC>12			
0 - 0.020	0 - 0.030			

h6

DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● Best for high efficiency milling of hardened steels and milling in high-speed machining centers.

Unit : mm

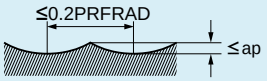
Order Number	PRFRAD	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VC4MBR0050	0.5	1	2.5	50	6	4	●	1
VC4MB**R0075**	0.75	1.5	4	50	6	4	●	1
VC4MB**R0100**	1	2	6	60	6	4	●	1
VC4MB**R0150**	1.5	3	8	70	6	4	●	1
VC4MB**R0200**	2	4	8	70	6	4	●	1
VC4MB**R0250**	2.5	5	12	80	6	4	●	1
VC4MB**R0300**	3	6	12	80	6	4	●	2
VC4MB**R0400**	4	8	14	90	8	4	●	2
VC4MB**R0500**	5	10	18	100	10	4	●	2
VC4MB**R0600**	6	12	22	110	12	4	●	2
VC4MB**R0700**	7	14	26	120	12	4	★	3
VC4MB**R0800**	8	16	30	140	16	4	●	2
VC4MB**R0900**	9	18	34	140	16	4	★	3
VC4MB**R1000**	10	20	38	160	20	4	★	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

VC4MB

Ball nose, Medium cut length, 4 flute

RECOMMENDED CUTTING CONDITIONS

Work material	Alloy steel, Tool steel, Pre-hardened steel, Hardened steel (−55HRC) AISI H13, AISI W1-10, AISI P21 etc.							Hardened steel (55−62HRC) AISI D2 etc.						
PRFRAD (mm)	α≤15°			α>15°			Depth of cut ap (mm)	α≤15°			α>15°			Depth of cut ap (mm)
	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed			Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		
		(mm/min)	(IPM)		(mm/min)	(IPM)			(mm/min)	(IPM)		(mm/min)	(IPM)	
R 0.5	40000	8000	315.0	40000	3800	149.6	0.06	40000	5600	220.5	40000	3100	122.0	0.05
R 0.75	40000	9600	378.0	40000	4800	189.0	0.09	40000	7200	283.5	38000	4200	165.4	0.08
R 1	40000	9600	378.0	40000	5600	220.5	0.11	40000	8000	315.0	28000	3100	122.0	0.10
R 1.5	40000	12000	472.4	32000	5600	220.5	0.13	32000	7700	303.1	19000	2900	114.2	0.12
R 2	32000	11000	433.1	24000	4700	185.0	0.15	24000	6200	244.1	14000	2500	98.4	0.13
R 2.5	25000	9000	354.3	19000	3800	149.6	0.20	19000	5300	208.7	12000	2200	86.6	0.15
R 3	21000	8400	330.7	15000	3400	133.9	0.25	16000	4800	189.0	9600	2000	78.7	0.20
R 4	16000	6400	252.0	12000	2600	102.4	0.30	12000	3600	141.7	7200	1600	63.0	0.20
R 5	13000	5200	204.7	9600	2200	86.6	0.50	10000	3200	126.0	5800	1300	51.2	0.20
R 6	9000	3600	141.7	7200	1700	66.9	0.50	7000	2200	86.6	4300	940	37.0	0.30
R 8	7500	2400	94.5	5000	1500	59.1	0.50	5000	1100	43.3	3100	600	23.6	0.30
R 10	6000	2000	78.7	4000	1300	51.2	0.50	4000	900	35.4	2500	500	19.7	0.30
Depth of cut														

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VCPSRB MIRACLE ORBIT

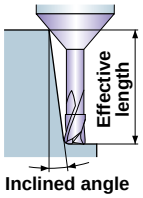
Corner radius, Short cut length, 2-4 flute, High precision type

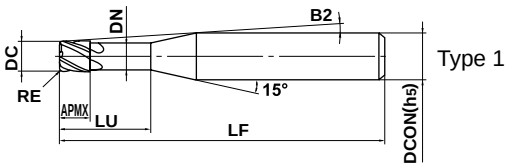
UWC VC 30° DC≤1.5 DC≥2

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎	◎	○	○		

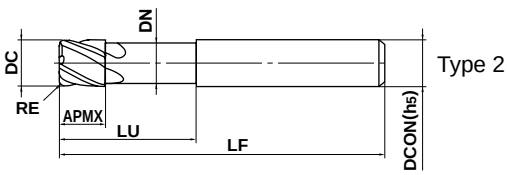


Effective length for inclined angle





Type 1



Type 2

R				
	0.05≤RE≤5			
	±0.01			
	0.6≤DC≤12			
	0 - 0.01			
h5	DCON=6	8≤DCON≤10	DCON=12	
	0 - 0.005	0 - 0.006	0 - 0.008	

● Radius tolerance : R ±0.01mm, Diameter tolerance : 0—-0.01mm Suitable for high precision and high efficient machining of die & mold.

Unit : mm

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												30'	1°	2°	3°
VCPSRBD0060N02R005	0.6	0.05	0.6	2	0.56	12.6°	50	6	2	★	1	2.1	2.2	2.4	2.6
VCPSRBD0060N02R01	0.6	0.1	0.6	2	0.56	12.6°	50	6	2	★	1	2.1	2.2	2.3	2.6
VCPSRBD0060N02R02	0.6	0.2	0.6	2	0.56	12.7°	50	6	2	★	1	2.1	2.2	2.2	2.5
VCPSRBD0060N04R01	0.6	0.1	0.6	4	0.56	10.9°	50	6	2	★	1	4.2	4.4	4.7	5.1
VCPSRBD0060N04R02	0.6	0.2	0.6	4	0.56	11°	50	6	2	★	1	4.2	4.3	4.7	5
VCPSRBD0080N04R005	0.8	0.05	0.8	4	0.76	10.7°	50	6	2	★	1	4.2	4.4	4.7	5.1
VCPSRBD0080N04R01	0.8	0.1	0.8	4	0.76	10.8°	50	6	2	★	1	4.2	4.4	4.7	5.1
VCPSRBD0080N04R02	0.8	0.2	0.8	4	0.76	10.8°	50	6	2	★	1	4.2	4.3	4.7	5
VCPSRBD0080N04R03	0.8	0.3	0.8	4	0.76	10.9°	50	6	2	★	1	4.2	4.3	4.6	5
VCPSRBD0080N06R01	0.8	0.1	0.8	6	0.76	9.4°	50	6	2	★	1	6.3	6.5	7	7.5
VCPSRBD0080N06R02	0.8	0.2	0.8	6	0.76	9.5°	50	6	2	★	1	6.3	6.5	7	7.5
VCPSRBD0080N06R03	0.8	0.3	0.8	6	0.76	9.5°	50	6	2	★	1	6.3	6.5	6.9	7.5
VCPSRBD0080N08R03	0.8	0.3	0.8	8	0.76	8.5°	50	6	2	★	1	8.3	8.6	9.2	10
VCPSRBD0100N04R005	1	0.05	1	4	0.94	10.5°	50	6	2	★	1	4.2	4.5	4.8	5.3
VCPSRBD0100N04R01	1	0.1	1	4	0.94	10.5°	50	6	2	★	1	4.2	4.5	4.8	5.3
VCPSRBD0100N04R02	1	0.2	1	4	0.94	10.6°	50	6	2	★	1	4.2	4.5	4.7	5.3
VCPSRBD0100N04R03	1	0.3	1	4	0.94	10.6°	50	6	2	★	1	4.2	4.5	4.6	5.2
VCPSRBD0100N04R04	1	0.4	1	4	0.94	10.7°	50	6	2	★	1	4.2	4.5	4.4	5.2
VCPSRBD0100N06R01	1	0.1	1	6	0.94	9.2°	50	6	2	★	1	6.4	6.7	7.2	7.8
VCPSRBD0100N06R02	1	0.2	1	6	0.94	9.2°	50	6	2	★	1	6.4	6.7	7.2	7.7
VCPSRBD0100N06R03	1	0.3	1	6	0.94	9.3°	50	6	2	★	1	6.3	6.6	7.2	7.7
VCPSRBD0100N06R04	1	0.4	1	6	0.94	9.4°	50	6	2	★	1	6.3	6.6	7.1	7.7
VCPSRBD0100N10R03	1	0.3	1	10	0.94	7.4°	50	6	2	★	1	10.5	10.9	11.8	12.7
VCPSRBD0100N10R04	1	0.4	1	10	0.94	7.4°	50	6	2	★	1	10.5	10.9	11.7	12.7
VCPSRBD0120N06R05	1.2	0.5	1.2	6	1.14	9.3°	50	6	2	★	1	6.3	6.6	7.1	7.7
VCPSRBD0120N10R05	1.2	0.5	1.2	10	1.14	7.3°	50	6	2	★	1	10.5	10.9	11.7	12.6
VCPSRBD0120N15R05	1.2	0.5	1.2	15	1.14	5.8°	50	6	2	★	1	15.7	16.3	17.5	18.9
VCPSRBD0150N04R01	1.5	0.1	1.5	4	1.44	10.2°	50	6	2	★	1	4.2	4.5	4.8	5.3
VCPSRBD0150N04R02	1.5	0.2	1.5	4	1.44	10.2°	50	6	2	★	1	4.2	4.5	4.7	5.3
VCPSRBD0150N04R03	1.5	0.3	1.5	4	1.44	10.3°	50	6	2	★	1	4.2	4.5	4.6	5.2
VCPSRBD0150N04R05	1.5	0.5	1.5	4	1.44	10.5°	50	6	2	●	1	4.2	4.4	4.3	5.2

● : Inventory maintained. ★ : Inventory maintained in Japan.

VCPSRB MIRACLE ORBIT

Corner radius, Short cut length, 2-4 flute, High precision type

Unit : mm

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												30'	1°	2°	3°
VCPSRBD0150N06R01	1.5	0.1	1.5	6	1.44	8.8°	50	6	2	★	1	6.4	6.7	7.2	7.8
VCPSRB**D0150N06R02**	1.5	0.2	1.5	6	1.44	8.9°	50	6	2	★	1	6.4	6.7	7.2	7.7
VCPSRB**D0150N06R03**	1.5	0.3	1.5	6	1.44	8.9°	50	6	2	★	1	6.3	6.6	7.2	7.7
VCPSRB**D0150N06R05**	1.5	0.5	1.5	6	1.44	9°	50	6	2	●	1	6.3	6.6	7.1	7.7
VCPSRB**D0150N10R01**	1.5	0.1	1.5	10	1.44	6.9°	50	6	2	★	1	10.6	11	11.8	12.7
VCPSRB**D0150N10R02**	1.5	0.2	1.5	10	1.44	7°	50	6	2	★	1	10.5	11	11.8	12.7
VCPSRB**D0150N10R03**	1.5	0.3	1.5	10	1.44	7°	50	6	2	★	1	10.5	10.9	11.8	12.7
VCPSRB**D0150N10R05**	1.5	0.5	1.5	10	1.44	7.1°	50	6	2	●	1	10.5	10.9	11.7	12.6
VCPSRB**D0150N15R01**	1.5	0.1	1.5	15	1.44	5.5°	50	6	2	★	1	15.8	16.3	17.5	18.9
VCPSRB**D0150N15R02**	1.5	0.2	1.5	15	1.44	5.5°	50	6	2	★	1	15.8	16.3	17.5	18.9
VCPSRB**D0150N15R03**	1.5	0.3	1.5	15	1.44	5.5°	50	6	2	★	1	15.7	16.3	17.5	18.9
VCPSRB**D0150N15R05**	1.5	0.5	1.5	15	1.44	5.7°	50	6	2	★	1	15.7	16.3	17.4	18.6
VCPSRB**D0150N20R03**	1.5	0.3	1.5	20	1.44	4.7°	60	6	2	★	1	20.9	21.6	22.9	24.5
VCPSRB**D0150N20R05**	1.5	0.5	1.5	20	1.44	4.8°	60	6	2	★	1	20.9	21.5	22.8	24.2
VCPSRB**D0200N06R01**	2	0.1	2	6	1.9	9.4°	50	6	4	★	1	6.3	6.6	6.9	7.5
VCPSRB**D0200N06R02**	2	0.2	2	6	1.9	9.7°	50	6	4	★	1	6.3	6.6	6.8	7.4
VCPSRB**D0200N06R03**	2	0.3	2	6	1.9	10°	50	6	4	★	1	6.3	6.6	6.7	7.4
VCPSRB**D0200N06R05**	2	0.5	2	6	1.9	10.3°	50	6	4	●	1	6.3	6.5	6.5	7.4
VCPSRB**D0200N10R01**	2	0.1	2	10	1.9	7.6°	50	6	4	★	1	10.5	10.9	11.4	12
VCPSRB**D0200N10R02**	2	0.2	2	10	1.9	7.7°	50	6	4	★	1	10.5	10.8	11.2	12
VCPSRB**D0200N10R03**	2	0.3	2	10	1.9	7.8°	50	6	4	★	1	10.5	10.8	11.1	11.9
VCPSRB**D0200N10R05**	2	0.5	2	10	1.9	8°	50	6	4	●	1	10.5	10.8	10.9	11.9
VCPSRB**D0200N15R01**	2	0.1	2	15	1.9	5.9°	50	6	4	★	1	15.7	16.1	16.8	17.5
VCPSRB**D0200N15R02**	2	0.2	2	15	1.9	5.9°	50	6	4	★	1	15.7	16.1	16.7	17.5
VCPSRB**D0200N15R03**	2	0.3	2	15	1.9	6°	50	6	4	★	1	15.7	16.1	16.6	17.4
VCPSRB**D0200N15R05**	2	0.5	2	15	1.9	6.1°	50	6	4	●	1	15.6	16.1	16.3	17.4
VCPSRB**D0200N20R03**	2	0.3	2	20	1.9	4.8°	60	6	4	★	1	20.8	21.4	21.9	22.9
VCPSRB**D0200N20R05**	2	0.5	2	20	1.9	4.9°	60	6	4	★	1	20.8	21.4	21.7	22.9
VCPSRB**D0200N25R03**	2	0.3	2	25	1.9	4°	60	6	4	★	1	26	26.6	27.5	28.3
VCPSRB**D0200N25R05**	2	0.5	2	25	1.9	4°	60	6	4	★	1	26	26.6	27	28.2
VCPSRB**D0250N08R01**	2.5	0.1	2.5	8	2.4	8.6°	50	6	4	★	1	8.4	8.7	9.2	9.9
VCPSRB**D0250N08R02**	2.5	0.2	2.5	8	2.4	8.7°	50	6	4	★	1	8.4	8.7	9	9.9
VCPSRB**D0250N08R03**	2.5	0.3	2.5	8	2.4	8.8°	50	6	4	★	1	8.4	8.7	8.9	9.9
VCPSRB**D0250N08R05**	2.5	0.5	2.5	8	2.4	9°	50	6	4	★	1	8.4	8.7	8.7	9.9
VCPSRB**D0250N08R10**	2.5	1	2.5	8	2.4	9.4°	50	6	4	●	1	8.3	8.7	8.2	9.9
VCPSRB**D0250N15R03**	2.5	0.3	2.5	15	2.4	5.5°	50	6	4	★	1	15.7	16.1	16.6	17.5
VCPSRB**D0250N15R05**	2.5	0.5	2.5	15	2.4	5.6°	50	6	4	★	1	15.6	16.1	16.3	17.5
VCPSRB**D0250N15R10**	2.5	1	2.5	15	2.4	5.7°	50	6	4	●	1	15.6	16.1	15.8	17.5
VCPSRB**D0300N10R01**	3	0.1	3	10	2.9	6.6°	60	6	4	★	1	10.5	10.9	11.4	12.3
VCPSRB**D0300N10R02**	3	0.2	3	10	2.9	6.6°	60	6	4	★	1	10.5	10.8	11.2	12.3
VCPSRB**D0300N10R03**	3	0.3	3	10	2.9	6.6°	60	6	4	★	1	10.5	10.8	11.1	12.3
VCPSRB**D0300N10R05**	3	0.5	3	10	2.9	6.7°	60	6	4	●	1	10.5	10.8	10.9	12.4
VCPSRB**D0300N10R10**	3	1	3	10	2.9	7°	60	6	4	●	1	10.4	10.8	10.4	12.4
VCPSRB**D0300N15R01**	3	0.1	3	15	2.9	4.8°	60	6	4	★	1	15.7	16.1	16.8	17.7
VCPSRB**D0300N15R02**	3	0.2	3	15	2.9	4.8°	60	6	4	★	1	15.7	16.1	16.7	17.8
VCPSRB**D0300N15R03**	3	0.3	3	15	2.9	4.8°	60	6	4	★	1	15.7	16.1	16.6	17.8
VCPSRB**D0300N15R05**	3	0.5	3	15	2.9	4.8°	60	6	4	●	1	15.6	16.1	16.3	17.8
VCPSRB**D0300N15R10**	3	1	3	15	2.9	5°	60	6	4	●	1	15.6	16.1	15.8	17.8
VCPSRB**D0300N20R01**	3	0.1	3	20	2.9	3.7°	60	6	4	★	1	20.8	21.4	22.1	23.1
VCPSRB**D0300N20R02**	3	0.2	3	20	2.9	3.7°	60	6	4	★	1	20.8	21.4	22	23.1
VCPSRB**D0300N20R03**	3	0.3	3	20	2.9	3.8°	60	6	4	★	1	20.8	21.4	21.9	23.2
VCPSRB**D0300N20R05**	3	0.5	3	20	2.9	3.8°	60	6	4	●	1	20.8	21.4	21.7	23.2

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												30'	1°	2°	3°
VCPSRBD0300N20R10	3	1	3	20	2.9	3.9°	60	6	4	●	1	20.8	21.3	21.2	23.2
VCPSRB**D0300N30R03**	3	0.3	3	30	2.9	2.6°	70	6	4	★	1	31.1	31.8	32.5	*
VCPSRB**D0300N30R05**	3	0.5	3	30	2.9	2.6°	70	6	4	★	1	31.1	31.8	32.2	*
VCPSRB**D0400N12R01**	4	0.1	4	12	3.9	3.8°	60	6	4	★	1	12.5	13	13.5	15.1
VCPSRB**D0400N12R02**	4	0.2	4	12	3.9	3.8°	60	6	4	★	1	12.5	13	13.4	15.2
VCPSRB**D0400N12R03**	4	0.3	4	12	3.9	3.8°	60	6	4	★	1	12.5	13	13.3	15.2
VCPSRB**D0400N12R05**	4	0.5	4	12	3.9	3.9°	60	6	4	●	1	12.5	13	13.1	15.3
VCPSRB**D0400N12R10**	4	1	4	12	3.9	4°	60	6	4	●	1	12.5	12.9	12.6	15.3
VCPSRB**D0400N20R01**	4	0.1	4	20	3.9	2.5°	60	6	4	★	1	20.8	21.4	22.1	*
VCPSRB**D0400N20R02**	4	0.2	4	20	3.9	2.5°	60	6	4	★	1	20.8	21.4	22	*
VCPSRB**D0400N20R03**	4	0.3	4	20	3.9	2.5°	60	6	4	★	1	20.8	21.4	21.9	*
VCPSRB**D0400N20R05**	4	0.5	4	20	3.9	2.5°	60	6	4	●	1	20.8	21.4	21.7	*
VCPSRB**D0400N20R10**	4	1	4	20	3.9	2.6°	60	6	4	●	1	20.8	21.3	21.2	*
VCPSRB**D0400N30R03**	4	0.3	4	30	3.9	1.8°	70	6	4	★	1	31.1	31.8	*	*
VCPSRB**D0400N30R05**	4	0.5	4	30	3.9	1.8°	70	6	4	●	1	31.1	31.8	*	*
VCPSRB**D0400N30R10**	4	1	4	30	3.9	1.8°	70	6	4	●	1	31.1	31.8	*	*
VCPSRB**D0500N15R05**	5	0.5	5	15	4.9	1.6°	60	6	4	★	1	15.6	16.1	*	*
VCPSRB**D0500N15R10**	5	1	5	15	4.9	1.6°	60	6	4	★	1	15.6	16.1	*	*
VCPSRB**D0500N30R05**	5	0.5	5	30	4.9	0.9°	70	6	4	★	1	31.1	*	*	*
VCPSRB**D0500N30R10**	5	1	5	30	4.9	0.9°	70	6	4	★	1	31.1	*	*	*
VCPSRB**D0600N18R01**	6	0.1	6	18	5.85	—	70	6	4	★	2	*	*	*	*
VCPSRB**D0600N18R02**	6	0.2	6	18	5.85	—	70	6	4	★	2	*	*	*	*
VCPSRB**D0600N18R03**	6	0.3	6	18	5.85	—	70	6	4	★	2	*	*	*	*
VCPSRB**D0600N18R05**	6	0.5	6	18	5.85	—	70	6	4	●	2	*	*	*	*
VCPSRB**D0600N18R10**	6	1	6	18	5.85	—	70	6	4	●	2	*	*	*	*
VCPSRB**D0600N18R20**	6	2	6	18	5.85	—	70	6	4	●	2	*	*	*	*
VCPSRB**D0600N41R05**	6	0.5	6	41	5.85	—	90	6	4	★	2	*	*	*	*
VCPSRB**D0600N50R10**	6	1	6	50	5.85	—	90	6	4	★	2	*	*	*	*
VCPSRB**D0800N24R01**	8	0.1	8	24	7.85	—	90	8	4	★	2	*	*	*	*
VCPSRB**D0800N24R02**	8	0.2	8	24	7.85	—	90	8	4	★	2	*	*	*	*
VCPSRB**D0800N24R03**	8	0.3	8	24	7.85	—	90	8	4	★	2	*	*	*	*
VCPSRB**D0800N24R05**	8	0.5	8	24	7.85	—	90	8	4	●	2	*	*	*	*
VCPSRB**D0800N24R10**	8	1	8	24	7.85	—	90	8	4	●	2	*	*	*	*
VCPSRB**D0800N24R20**	8	2	8	24	7.85	—	90	8	4	●	2	*	*	*	*
VCPSRB**D0800N24R30**	8	3	8	24	7.85	—	90	8	4	●	2	*	*	*	*
VCPSRB**D0800N50R10**	8	1	8	50	7.85	—	90	8	4	★	2	*	*	*	*
VCPSRB**D0800N50R30**	8	3	8	50	7.85	—	90	8	4	★	2	*	*	*	*
VCPSRB**D1000N30R03**	10	0.3	10	30	9.7	—	100	10	4	★	2	*	*	*	*
VCPSRB**D1000N30R05**	10	0.5	10	30	9.7	—	100	10	4	●	2	*	*	*	*
VCPSRB**D1000N30R10**	10	1	10	30	9.7	—	100	10	4	●	2	*	*	*	*
VCPSRB**D1000N30R20**	10	2	10	30	9.7	—	100	10	4	●	2	*	*	*	*
VCPSRB**D1000N30R30**	10	3	10	30	9.7	—	100	10	4	●	2	*	*	*	*
VCPSRB**D1000N30R40**	10	4	10	30	9.7	—	100	10	4	●	2	*	*	*	*
VCPSRB**D1000N50R10**	10	1	10	50	9.7	—	100	10	4	★	2	*	*	*	*
VCPSRB**D1000N50R30**	10	3	10	50	9.7	—	100	10	4	★	2	*	*	*	*
VCPSRB**D1200N36R03**	12	0.3	12	36	11.7	—	110	12	4	★	2	*	*	*	*
VCPSRB**D1200N36R05**	12	0.5	12	36	11.7	—	110	12	4	●	2	*	*	*	*
VCPSRB**D1200N36R10**	12	1	12	36	11.7	—	110	12	4	●	2	*	*	*	*
VCPSRB**D1200N36R20**	12	2	12	36	11.7	—	110	12	4	●	2	*	*	*	*
VCPSRB**D1200N36R30**	12	3	12	36	11.7	—	110	12	4	●	2	*	*	*	*
VCPSRB**D1200N36R40**	12	4	12	36	11.7	—	110	12	4	●	2	*	*	*	*
VCPSRB**D1200N36R50**	12	5	12	36	11.7	—	110	12	4	●	2	*	*	*	*

* No interference

VCPSRB MIRACLE ORBIT

Corner radius, Short cut length, 2-4 flute, High precision type

RECOMMENDED CUTTING CONDITIONS

Work material		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Hardened steel (45—55HRC) AISI H13 etc.			Hardened steel (55—62HRC) AISI D2 etc.		
DC (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
0.6	2	48000	200—600	7.9— 23.6	40000	160—500	6.3— 19.7	22000	80—250	3.1— 9.8
	4	48000	160—500	6.3— 19.7	40000	100—300	3.9— 11.8	22000	50—150	2.0— 5.9
0.8	4	48000	240—750	9.4— 29.5	32000	160—500	6.3— 19.7	19000	80—250	3.1— 9.8
	6	38000	190—600	7.5— 23.6	26000	130—400	5.1— 15.7	16000	70—200	2.8— 7.9
	8	29000	150—450	5.9— 17.7	19000	100—300	3.9— 11.8	12000	50—150	2.0— 5.9
1	4	48000	270—900	10.6— 35.4	32000	180—600	7.1— 23.6	19000	90—300	3.5—11.8
	6	38000	220—720	8.7— 28.3	26000	150—480	5.9— 18.9	16000	70—240	2.8— 9.4
	10	29000	160—540	6.3— 21.3	19000	110—360	4.3— 14.2	12000	60—180	2.4— 7.1
1.2	6	48000	300—900	11.8— 35.4	32000	200—600	7.9— 23.6	19000	100—300	3.9—11.8
	10	38000	240—720	9.4— 28.3	26000	160—480	6.3— 18.9	15000	80—240	3.1— 9.4
	15	29000	180—540	7.1— 21.3	19000	120—360	4.7— 14.2	12000	60—180	2.4— 7.1
1.5	4	41000	300—900	11.8— 35.4	27000	200—600	7.9— 23.6	16000	100—300	3.9—11.8
	6	32000	240—720	9.4— 28.3	22000	160—480	6.3— 18.9	13000	80—240	3.1— 9.4
	10	24000	180—540	7.1— 21.3	16000	120—360	4.7— 14.2	10000	60—180	2.4— 7.1
2	6	36000	600—2000	23.6— 78.7	24000	400—1300	15.7— 51.2	14000	200—650	7.9—25.6
	10	29000	480—1600	18.9— 63.0	19000	320—1000	12.6— 39.4	12000	160—520	6.3—20.5
	15	22000	360—1200	14.2— 47.2	14000	240—780	9.4— 30.7	9000	120—390	4.7—15.4
2.5	8	33000	750—2400	29.5— 94.5	22000	500—1600	19.7— 63.0	13000	250—800	9.8—31.5
	15	20000	450—1400	17.7— 55.1	13000	300—960	11.8— 37.8	8000	150—480	5.9—18.9
3	10	30000	900—3000	35.4—118.1	20000	600—2000	23.6— 78.7	12000	300—1000	11.8—39.4
	15	24000	720—2400	28.3— 94.5	16000	480—1600	18.9— 63.0	10000	240—800	9.4—31.5
	20	18000	540—1800	21.3— 70.9	12000	360—1200	14.2— 47.2	7000	180—600	7.1—23.6
4	12	26000	1200—4500	47.2—177.2	17000	800—3000	31.5—118.1	10000	400—1500	15.7—59.1
	20	20000	960—2000	37.8— 78.7	14000	640—2000	25.2— 78.7	8000	320—2000	12.6—78.7
	30	15000	720—1000	28.3— 39.4	10000	480—1000	18.9— 39.4	6000	240—1000	9.4—39.4
5	15	20000	1200—4800	47.2—189.0	13000	780—3120	30.7—122.8	10000	520—2000	20.5—78.7
	30	12000	720—1900	28.3— 74.8	8000	480—1600	18.9— 63.0	7000	360—1120	14.2—44.1
6	18	20000	1600—7500	63.0—295.3	13000	1100—5000	43.3—196.9	8000	550—2500	21.7—98.4
	41	15000	900—2400	35.4— 94.5	12000	720—1600	28.3— 63.0	10000	600—1200	23.6—47.2
	50	10000	600—1200	23.6— 47.2	8000	480—800	18.9— 31.5	6000	360—530	14.2—20.9
8	24	15000	1900—7500	74.8—295.3	10000	1300—5000	51.2—196.9	6000	650—2500	25.6—98.4
	50	10000	1300—2400	51.2— 94.5	8000	1000—2200	39.4— 86.6	3000	320—600	12.6—23.6
10	30	12000	1600—7500	63.0—295.3	8000	1100—5000	43.3—196.9	5000	550—2500	21.7—98.4
	50	10000	1300—3200	51.2—126.0	7000	950—2200	37.4— 86.6	2500	280—600	11.0—23.6
12	36	10000	1500—7500	59.1—295.3	7000	1000—5000	39.4—196.9	4000	500—2500	19.7—98.4
Depth of cut		≤0.2RE (DC≤ϕ2) ≤0.4RE (DC>ϕ2) ≤0.1mm (DC≤ϕ1.5) ≤0.2mm (DC=ϕ2 to ϕ5) ≤0.5mm (DC≥ϕ6)						≤0.1RE (DC≤ϕ2) ≤0.2RE (DC>ϕ2) ≤0.05mm (DC≤ϕ1.5) ≤0.1mm (DC=ϕ2 to ϕ5) ≤0.3mm (DC≥ϕ6)		

1) The cutting conditions above are a guide only to machining with cutting edges with a corner radius. When machining with peripheral cutting edges, use the minimum feed rate as a guide.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) When contour milling, cutting conditions can vary greatly due to the geometry of the workpiece and depth of cut.
4) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VCPSRB MIRACLE ORBIT

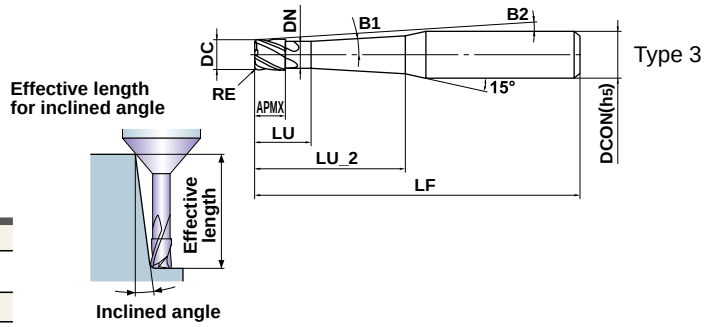
Corner radius, Short cut length, 2-4 flute, Taper neck, High precision

UWC VC 30° DC=1.5 DC≥2

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎	◎	○	○		

Taper neck type





R	0.5≤RE≤3				
	±0.01				
	1.5≤DC≤12				
	0 - 0.01				
h5	DCON=6	8≤DCON≤10	12≤DCON≤16		
	0 - 0.005	0 - 0.006	0 - 0.008		

● Radius tolerance : R ±0.01mm, Diameter tolerance : 0—-0.01mm Suitable for high precision and high efficient machining of die & mold.

Unit : mm

Order Number	DC	RE	BHTA	APMX	LU_2	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 1°	2°	3°
VCPSRBD0150N03L06R05	1.5	0.5	1° 30'	1.5	6	3	1.44	9°	50	6	2	●	3	—	7.1	7.7
VCPSRB**D0150N03L10R05**	1.5	0.5	1° 30'	1.5	10	3	1.44	7.2°	50	6	2	●	3	—	11.3	12.2
VCPSRB**D0200N04L10R05**	2	0.5	1° 30'	2	10	4	1.9	6.7°	60	6	4	●	3	—	11.5	12.4
VCPSRB**D0200N04L15R05**	2	0.5	1° 30'	2	15	4	1.9	5.3°	60	6	4	●	3	—	16.7	18
VCPSRB**D0250N05L12R10**	2.5	1	1° 30'	2.5	12	5	2.4	5.6°	60	6	4	●	3	—	14.2	15.3
VCPSRB**D0250N05L20R10**	2.5	1	1° 30'	2.5	20	5	2.4	4°	60	6	4	●	3	—	22.5	24.2
VCPSRB**D0300N06L15R05**	3	0.5	1° 30'	3	15	6	2.9	4.4°	60	6	4	●	3	—	16.9	18.2
VCPSRB**D0300N06L20R05**	3	0.5	1° 30'	3	20	6	2.9	3.6°	60	6	4	●	3	—	22.1	23.8
VCPSRB**D0300N06L15R10**	3	1	1° 30'	3	15	6	2.9	4.4°	60	6	4	●	3	—	17.4	18.7
VCPSRB**D0300N06L20R10**	3	1	1° 30'	3	20	6	2.9	3.6°	60	6	4	●	3	—	22.6	24.4
VCPSRB**D0400N08L20R10**	4	1	1° 30'	4	20	8	3.9	2.6°	60	6	4	●	3	—	22.8	✶
VCPSRB**D0400N08L30R10**	4	1	1° 30'	4	30	8	3.9	1.9°	70	6	4	●	3	—	✶	✶
VCPSRB**D0500N08L40R05**	5	0.5	1°	5	40	8	4.9	2°	90	8	4	★	3	41.2	✶	✶
VCPSRB**D0500N08L60R05**	5	0.5	1°	5	60	8	4.9	1.4°	110	8	4	★	3	61.2	✶	✶
VCPSRB**D0500N08L40R10**	5	1	1°	5	40	8	4.9	2°	90	8	4	★	3	41.7	✶	✶
VCPSRB**D0500N08L60R10**	5	1	1°	5	60	8	4.9	1.4°	110	8	4	★	3	61.7	✶	✶
VCPSRB**D0600N08L40R20**	6	2	1°	6	40	8	5.85	1.4°	70	8	4	●	3	42.8	✶	✶
VCPSRB**D0600N08L60R20**	6	2	1°	6	60	8	5.85	1°	100	8	4	★	3	✶	✶	✶
VCPSRB**D0800N10L53R20**	8	2	1°	8	53	10	7.85	1.1°	90	10	4	●	3	55.9	✶	✶
VCPSRB**D0800N10L70R20**	8	2	1°	8	70	10	7.85	1.6°	130	12	4	★	3	72.9	✶	✶
VCPSRB**D1000N12L55R30**	10	3	1°	10	55	12	9.7	1.1°	100	12	4	●	3	59.4	✶	✶
VCPSRB**D1000N12L70R30**	10	3	1°	10	70	12	9.7	0.9°	130	12	4	★	3	✶	✶	✶
VCPSRB**D1200N24L70R30**	12	3	1°	12	70	24	11.7	1.6°	130	16	4	★	3	75.2	✶	✶

✶ No interference

VCPSRB MIRACLE ORBIT

Corner radius, Short cut length, 2-4 flute, High precision type

RECOMMENDED CUTTING CONDITIONS

Taper neck type

Work material			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Hardened steel (45—55HRC) AISI H13 etc.			Hardened steel (55—62HRC) AISI D2 etc.		
DC (mm)	BHTA	LU_2 (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
1.5	1° 30'	6	36000	270—810	10.6— 31.9	24000	180—540	7.1— 21.3	15000	90—270	3.5— 10.6
1.5	1° 30'	10	28000	210—630	8.3— 24.8	19000	140—420	5.5— 16.5	11000	70—210	2.8— 8.3
2	1° 30'	10	32000	540—1800	21.3— 70.9	22000	360—1200	14.2— 47.2	13000	180—590	7.1— 23.2
2	1° 30'	15	25000	420—1400	16.5— 55.1	17000	280—910	11.0— 35.8	10000	140—460	5.5— 18.1
2.5	1° 30'	12	26000	600—1900	23.6— 74.8	18000	400—1300	15.7— 51.2	11000	200—640	7.9— 25.2
2.5	1° 30'	20	20000	450—140	17.7— 5.5	13000	300—960	11.8— 37.8	8000	150—480	5.9— 18.9
3	1° 30'	15	27000	810—2700	31.9—106.3	18000	540—1800	21.3— 70.9	11000	270—900	10.6— 35.4
3	1° 30'	20	21000	630—2100	24.8— 82.7	14000	420—1400	16.5— 55.1	8000	210—700	8.3— 27.6
4	1° 30'	20	23000	1080—3000	42.5—118.1	15000	720—3000	28.3—118.1	9000	360—3000	14.2—118.1
4	1° 30'	30	18000	840—1500	33.1— 59.1	12000	560—1500	22.0— 59.1	7000	280—1500	11.0— 59.1
5	1°	40	10000	520—1400	20.5— 55.1	7000	420—840	16.5— 33.1	5000	260—600	10.2— 23.6
5	1°	60	7000	360—840	14.2— 33.1	5000	300—500	11.8— 19.7	4000	210—400	8.3— 15.7
6	1°	40	20000	1650—4500	65.0—177.2	13000	1100—3000	43.3—118.1	8000	550—1500	21.7— 59.1
8	1°	53	15000	1950—4500	76.8—177.2	10000	1300—3000	51.2—118.1	6000	650—1500	25.6— 59.1
10	1°	55	12000	1650—4500	65.0—177.2	8000	1100—3000	43.3—118.1	5000	550—1500	21.7— 59.1
Depth of cut			≤0.2RE (DC≤φ2) ≤0.4RE (DC>φ2) ≤0.1mm (DC≤φ1.5) ≤0.2mm (DC=φ2 to φ5) ≤0.5mm (DC≥φ6)			≤0.1RE (DC≤φ2) ≤0.2RE (DC>φ2) ≤0.05mm (DC≤φ1.5) ≤0.1mm (DC=φ2 toφ5) ≤0.3mm (DC≥φ6)					

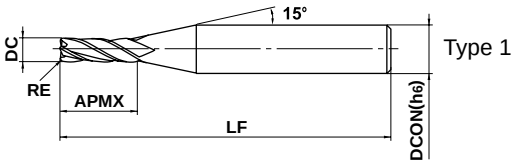
1) The cutting conditions above are a guide only to machining with cutting edges with a corner radius. When machining with peripheral cutting edges, use the minimum feed rate as a guide.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) When contour milling, cutting conditions can vary greatly due to the geometry of the workpiece and depth of cut.
4) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VC4JRB

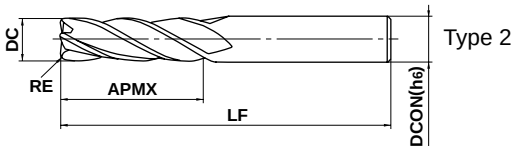
Corner radius end mill, Semi long cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	○	○	○		





Type 1



Type 2

h6

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● 4 flute corner radius end mill for longer reach applications.

Unit : mm

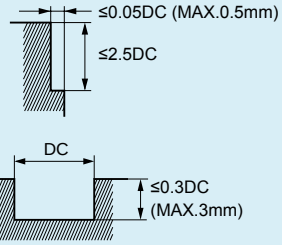
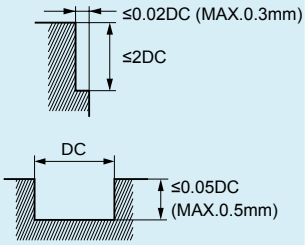
Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VC4JRBD0300R0030	3	0.3	12	50	6	4	★	1
VC4JRB**D0400R0030**	4	0.3	15	50	6	4	★	1
VC4JRB**D0400R0050**	4	0.5	15	50	6	4	★	1
VC4JRB**D0500R0030**	5	0.3	20	60	6	4	★	1
VC4JRB**D0500R0050**	5	0.5	20	60	6	4	★	1
VC4JRB**D0600R0030**	6	0.3	20	60	6	4	★	2
VC4JRB**D0600R0050**	6	0.5	20	60	6	4	★	2
VC4JRB**D0600R0100**	6	1	20	60	6	4	★	2
VC4JRB**D0800R0030**	8	0.3	25	70	8	4	★	2
VC4JRB**D0800R0050**	8	0.5	25	70	8	4	★	2
VC4JRB**D0800R0100**	8	1	25	70	8	4	★	2
VC4JRB**D0800R0150**	8	1.5	25	70	8	4	★	2
VC4JRB**D0800R0200**	8	2	25	70	8	4	★	2
VC4JRB**D1000R0030**	10	0.3	30	90	10	4	★	2
VC4JRB**D1000R0050**	10	0.5	30	90	10	4	★	2
VC4JRB**D1000R0100**	10	1	30	90	10	4	★	2
VC4JRB**D1000R0150**	10	1.5	30	90	10	4	★	2
VC4JRB**D1000R0200**	10	2	30	90	10	4	★	2
VC4JRB**D1200R0050**	12	0.5	30	90	12	4	★	2
VC4JRB**D1200R0100**	12	1	30	90	12	4	★	2
VC4JRB**D1200R0150**	12	1.5	30	90	12	4	★	2
VC4JRB**D1200R0200**	12	2	30	90	12	4	★	2
VC4JRB**D1600R0050**	16	0.5	50	110	16	4	★	2
VC4JRB**D1600R0100**	16	1	50	110	16	4	★	2
VC4JRB**D1600R0150**	16	1.5	50	110	16	4	★	2
VC4JRB**D1600R0200**	16	2	50	110	16	4	★	2
VC4JRB**D2000R0050**	20	0.5	55	110	20	4	★	2
VC4JRB**D2000R0100**	20	1	55	110	20	4	★	2
VC4JRB**D2000R0150**	20	1.5	55	110	20	4	★	2
VC4JRB**D2000R0200**	20	2	55	110	20	4	★	2

★ : Inventory maintained in Japan.

VC4JRB

Corner radius end mill, Semi long cut length, 4 flute

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
3	4200	110	4.3	3400	95	3.7	2600	70	2.8	2100	50	2.0
4	3400	140	5.5	2700	110	4.3	2100	85	3.3	1700	60	2.4
5	2900	170	6.7	2300	140	5.5	1800	100	3.9	1500	70	2.8
6	2500	200	7.9	2000	170	6.7	1500	130	5.1	1300	85	3.3
8	1900	220	8.7	1500	170	6.7	1200	150	5.9	1000	85	3.3
10	1600	220	8.7	1300	170	6.7	950	130	5.1	800	85	3.3
12	1300	170	6.7	1100	150	5.9	800	100	3.9	670	70	2.8
16	1000	140	5.5	820	110	4.3	600	80	3.1	500	50	2.0
20	800	110	4.3	650	85	3.3	480	70	2.8	400	40	1.6
Depth of cut												

1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) The above table shows cutting conditions for shoulder milling. For slotting, please reduce the feed rate only to 50% of the table figure. Please set the revolution rate at 60% and the feed rate at 40% when slotting austenitic stainless steels.
4) When drilling, please set the feed rate at 1/3 or below of the above value.
5) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

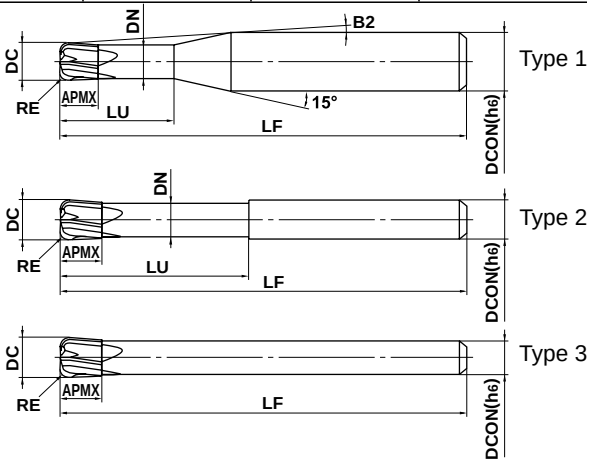
VCHFRB

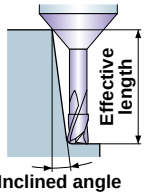
High feed corner radius, 4 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎	○		○		







R			
0.5≤RE≤3			
±0.015			
DC≤12	DC>12		
0 - 0.02	0 - 0.03		
h6	DCON=6	8≤DCON≤10	12≤DCON≤16
	0 - 0.008	0 - 0.009	0 - 0.011

● Suitable for high feed and efficient machining of die & mold.

Unit : mm

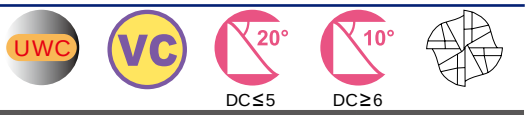
Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
VCHFRBD0200R050N06	2	0.5	2	6	1.9	8.7°	50	6	4	★	1	6.2	6.5	6.9	7.5
VCHFRBD0200R050N10	2	0.5	2	10	1.9	6.7°	70	6	4	★	1	10.4	10.8	11.5	12.4
VCHFRBD0300R075N09	3	0.75	3	9	2.9	6.2°	50	6	4	★	1	9.4	9.7	10.4	11.1
VCHFRBD0300R075N15	3	0.75	3	15	2.9	4.3°	70	6	4	★	1	15.6	16.1	17.3	18.6
VCHFRBD0400R100N12	4	1	4	12	3.9	3.9°	50	6	4	★	1	12.4	12.8	13.7	14.7
VCHFRBD0400R100N20	4	1	4	20	3.9	2.6°	70	6	4	★	1	20.7	21.4	22.9	*
VCHFRBD0500R120N15	5	1.2	5	15	4.9	1.9°	70	6	4	★	1	15.5	16	*	*
VCHFRBD0600R150N18	6	1.5	6	18	5.85	—	50	6	4	★	2	*	*	*	*
VCHFRBD0600R150N30	6	1.5	6	30	5.85	—	90	6	4	★	2	*	*	*	*
VCHFRBD0700R150A050	7	1.5	7	—	—	—	50	6	4	★	3	*	*	*	*
VCHFRBD0700R150A080	7	1.5	7	—	—	—	80	6	4	★	3	*	*	*	*
VCHFRBD0800R200N24	8	2	8	24	7.85	—	60	8	4	★	2	*	*	*	*
VCHFRBD0800R200N40	8	2	8	40	7.85	—	90	8	4	★	2	*	*	*	*
VCHFRBD0900R200A065	9	2	9	—	—	—	65	8	4	★	3	*	*	*	*
VCHFRBD0900R200A100	9	2	9	—	—	—	100	8	4	★	3	*	*	*	*
VCHFRBD1000R200N30	10	2	10	30	9.7	—	70	10	4	★	2	*	*	*	*
VCHFRBD1000R200N50	10	2	10	50	9.7	—	100	10	4	★	2	*	*	*	*
VCHFRBD1100R200A070	11	2	11	—	—	—	70	10	4	★	3	*	*	*	*
VCHFRBD1100R200A110	11	2	11	—	—	—	110	10	4	★	3	*	*	*	*
VCHFRBD1200R300N36	12	3	12	36	11.7	—	75	12	4	★	2	*	*	*	*
VCHFRBD1200R300N60	12	3	12	60	11.7	—	110	12	4	★	2	*	*	*	*
VCHFRBD1300R300A075	13	3	13	—	—	—	75	12	4	★	3	*	*	*	*
VCHFRBD1300R300A120	13	3	13	—	—	—	120	12	4	★	3	*	*	*	*
VCHFRBD1600R300N80	16	3	16	80	15.5	—	140	16	4	★	2	*	*	*	*

* No interference

★ : Inventory maintained in Japan.

VCHFRB

High feed corner radius, taper neck, 4 flute

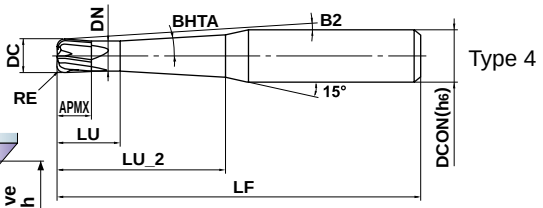


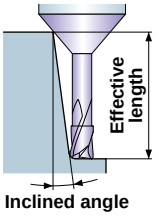
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎	○	○	○		

Taper neck type



Effective length for inclined angle





R		
0.5≤RE≤3		
±0.015		

DC≤12	DC>12	
0 - 0.02	0 - 0.03	

h6		
DCON=6	8≤DCON≤10	12≤DCON≤16
0 - 0.008	0 - 0.009	0 - 0.011

● Suitable for high feed and efficient machining of die & mold.

Unit : mm

Order Number	DC	RE	BHTA	APMX	LU_2	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 1°	2°	3°
VCHFRBD0200R050N12	2	0.5	1°	2	12	4	1.9	6°	70	6	4	★	4	12.9	13.9	15
VCHFRB**D0200R050N16**	2	0.5	1°	2	16	4	1.9	5°	70	6	4	★	4	16.9	18.2	19.6
VCHFRB**D0200R050N20**	2	0.5	1°	2	20	4	1.9	4.3°	70	6	4	★	4	20.9	22.5	24.3
VCHFRB**D0300R075N18**	3	0.75	1°	3	18	6	2.9	3.8°	80	6	4	★	4	19.3	20.7	22.3
VCHFRB**D0300R075N24**	3	0.75	1°	3	24	6	2.9	3°	80	6	4	★	4	25.3	27.2	✶
VCHFRB**D0300R075N30**	3	0.75	1°	3	30	6	2.9	2.6°	80	6	4	★	4	31.3	33.6	✶
VCHFRB**D0400R100N24**	4	1	1°	4	24	8	3.9	2.2°	90	6	4	★	4	25.7	27.6	✶
VCHFRB**D0400R100N32**	4	1	1°	4	32	8	3.9	1.7°	90	6	4	★	4	33.7	✶	✶
VCHFRB**D0400R100N40**	4	1	1°	4	40	8	3.9	1.4°	90	6	4	★	4	41.7	✶	✶
VCHFRB**D0500R120N30**	5	1.2	1°	5	30	8	4.9	1°	90	6	4	★	4	✶	✶	✶
VCHFRB**D0500R120N40**	5	1.2	1°	5	40	8	4.9	2°	90	8	4	★	4	41.9	✶	✶
VCHFRB**D0500R120N50**	5	1.2	1°	5	50	8	4.9	1.7°	110	8	4	★	4	51.9	✶	✶
VCHFRB**D0600R150N50**	6	1.5	1°	6	50	16	5.85	1.2°	110	8	4	★	4	52.9	✶	✶
VCHFRB**D0600R150N67**	6	1.5	1°	6	67	16	5.85	0.9°	130	8	4	★	4	✶	✶	✶
VCHFRB**D0800R200N70**	8	2	1°	8	70	18	7.85	0.9°	120	10	4	★	4	✶	✶	✶
VCHFRB**D0800R200N90**	8	2	1°	8	90	18	7.85	1.3°	150	12	4	★	4	93.5	✶	✶
VCHFRB**D1000R200N80**	10	2	1°	10	80	20	9.7	2°	140	16	4	★	4	83.9	✶	✶
VCHFRB**D1000R200N110**	10	2	1°	10	110	20	9.7	1.5°	160	16	4	★	4	113.9	✶	✶
VCHFRB**D1200R300N110**	12	3	1°	12	110	24	11.7	1.1°	160	16	4	★	4	115.2	✶	✶

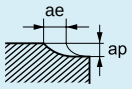
✶ No interference

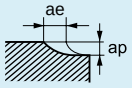
★ : Inventory maintained in Japan.

VCHFRB

High feed corner radius, 4 flute

RECOMMENDED CUTTING CONDITIONS

Work material		Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.				
DC (mm)	RE (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
2	R 0.5	33000	10000	393.7	0.08	0.8	27000	8400	330.7	0.05	0.8
3	R 0.75	22000	11000	433.1	0.12	1.2	18000	9000	354.3	0.08	1.2
4	R 1	17000	12000	472.4	0.15	1.5	14000	9500	374.0	0.12	1.5
5	R 1.2	13000	13000	511.8	0.20	2.0	11000	11000	433.1	0.15	2.0
6	R 1.5	11000	13000	511.8	0.25	2.5	9000	11000	433.1	0.15	2.5
7	R 1.5	9400	13000	511.8	0.25	3.0	7800	11000	433.1	0.15	3.0
8	R 2	8200	13000	511.8	0.30	3.0	7000	11000	433.1	0.20	3.0
9	R 2	7300	13000	511.8	0.30	4.0	6000	11000	433.1	0.20	4.0
10	R 2	6500	13000	511.8	0.30	4.5	5500	11000	433.1	0.20	4.5
11	R 2	6000	12000	472.4	0.30	5.5	5000	10000	393.7	0.20	5.5
12	R 3	5500	12000	472.4	0.45	4.5	4600	10000	393.7	0.30	4.5
13	R 3	5000	12000	472.4	0.45	5.5	4200	10000	393.7	0.30	5.5
16	R 3	4100	10000	393.7	0.45	7.5	3400	8800	346.5	0.30	7.5
Depth of cut											

Work material		Hardened steel (45−55HRC) AISI H13 etc.					Hardened steel (55−62HRC) AISI D2 etc.				
DC (mm)	RE (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
2	R 0.5	24000	7500	295.3	0.04	0.8	16000	3000	118.1	0.03	0.8
3	R 0.75	16000	8500	334.6	0.06	1.2	11000	3300	129.9	0.05	1.2
4	R 1	12000	8800	346.5	0.08	1.5	8000	3500	137.8	0.07	1.5
5	R 1.2	9600	9500	374.0	0.10	2.0	6400	3800	149.6	0.08	2.0
6	R 1.5	8000	9600	378.0	0.10	2.5	5300	3800	149.6	0.10	2.5
7	R 1.5	6900	9600	378.0	0.10	3.0	4600	3800	149.6	0.10	3.0
8	R 2	6000	9600	378.0	0.15	3.0	4000	3800	149.6	0.13	3.0
9	R 2	5300	9500	374.0	0.15	4.0	3800	3800	149.6	0.13	4.0
10	R 2	4800	9500	374.0	0.15	4.5	3200	3800	149.6	0.13	4.5
11	R 2	4500	9000	354.3	0.15	5.5	2900	3500	137.8	0.13	5.5
12	R 3	4100	9000	354.3	0.25	4.5	2700	3500	137.8	0.20	4.5
13	R 3	3700	8900	350.4	0.25	5.5	2500	3500	137.8	0.20	5.5
16	R 3	3000	7800	307.1	0.25	7.5	2000	3200	126.0	0.20	7.5
Depth of cut											

Coefficients respective of tool overhang

Type	Overhang	Revolution	Feed rate	Depth of cut ap
Straight	L/D≤5	100%	100%	100%
	L/D=6	90%	80%	80%
	L/D=7	80%	70%	70%
Taper neck	L/D=6	100%	100%	100%
	L/D=8	90%	80%	80%
	L/D≥10	80%	70%	70%

1) The above table shows cutting conditions when machining with the corner radius cutting edge.
2) This table shows the cutting conditions with less than 5D overhang length. In the case of longer overhangs, the revolution and the feed rate should be reduced proportionately.
3) If the depth of cut is smaller than this table, feed rate can be increased.
4) Using air blow or mist is recommended.
5) When contour milling, cutting conditions can vary greatly due to the geometry of the workpiece and depth of cut.
6) When machining inclinations in the Z direction, set the inclination angle at 2° and reduce the feed rate by 50%.
7) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VCHFRB – Inch sizes

High feed corner radius, 4 flute





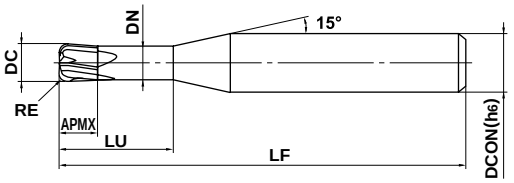


DC≤3/16

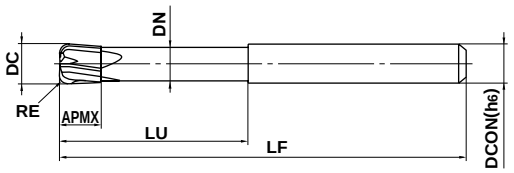

DC≥1/4


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎	○		○		





Type 1



Type 2

R	.030"≤RE≤.120"				
	±.0006"				
	DC>.5000"				
	0 -.0008"				
h6	.2500"≤DCON≤.3750"	DCON=.5000"			
	0 -.00035"	0 -.00043"			

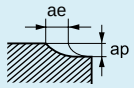
● Suitable for high feed and efficient machining of die & mold.

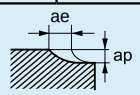
Unit : inch

Order Number	DC	RE	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VCHFRBD1/8N3DR0.03	.1250	.030	.125	.375	.1191	2.250	.2500	4	●	1
VCHFRB**D1/8N5DR0.03**	.1250	.030	.125	.625	.1191	2.250	.2500	4	●	1
VCHFRB**D3/16N3DR0.05**	.1875	.050	.188	.563	.1796	2.250	.2500	4	●	1
VCHFRB**D3/16N5DR0.05**	.1875	.050	.188	.938	.1796	2.250	.2500	4	●	1
VCHFRB**D1/4N3DR0.06**	.2500	.060	.250	.750	.2421	3.000	.2500	4	●	2
VCHFRB**D1/4N5DR0.06**	.2500	.060	.250	1.250	.2421	3.000	.2500	4	●	2
VCHFRB**D3/8N3DR0.08**	.3750	.080	.375	1.125	.3612	4.000	.3750	4	●	2
VCHFRB**D3/8N5DR0.08**	.3750	.080	.375	1.875	.3612	4.000	.3750	4	●	2
VCHFRB**D1/2N3DR0.12**	.5000	.120	.500	1.500	.4843	5.000	.5000	4	●	2

● : Inventory maintained.

RECOMMENDED CUTTING CONDITIONS

Work material		Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.				
DC (inch)	**RE** (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
.1250	R .030	21000	11000	433	.0045	.049	17000	9000	354	.0032	.049
.1875	R .050	14000	13000	512	.0075	.066	12000	11000	433	.0053	.066
.2500	R .060	10000	13000	512	.0090	.098	8600	11000	433	.0063	.098
.3750	R .080	6800	13000	512	.0120	.161	5700	11000	433	.0084	.161
.5000	R .120	5100	12000	472	.0180	.195	4300	10000	394	.0126	.195
Depth of cut											

Work material		Hardened steel (45−55HRC) AISI H13 etc.					Hardened steel (55−62HRC) AISI D2 etc.				
DC (inch)	**RE** (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
.1250	R .030	15000	8500	335	.0025	.049	10000	3200	126	.0020	.049
.1875	R .050	10000	9300	366	.0042	.066	6700	3700	146	.0034	.066
.2500	R .060	7600	9600	378	.0050	.098	5000	3800	150	.0040	.098
.3750	R .080	5000	9500	374	.0067	.161	3300	3600	142	.0054	.161
.5000	R .120	3800	8900	350	.0101	.195	2500	3400	134	.0081	.195
Depth of cut											

Coefficients respective of tool overhang

Type	Overhang	Revolution	Feed rate	Depth of cut ap
Straight	L/D≤5	100%	100%	100%
	L/D=6	90%	80%	80%
	L/D=7	80%	70%	70%
Taper neck	L/D=6	100%	100%	100%
	L/D=8	90%	80%	80%
	L/D≥10	80%	70%	70%

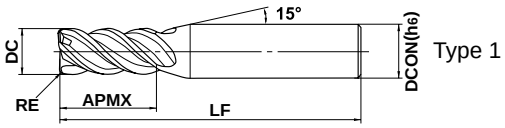
1) The above table shows cutting conditions when machining with the corner radius cutting edge.
2) This table shows the cutting conditions with less than 5D overhang length. In the case of longer overhangs, the revolution and the feed rate should be reduced proportionately.
3) If the depth of cut is smaller than this table, feed rate can be increased.
4) Using air blow or mist is recommended.
5) When contour milling, cutting conditions can vary greatly due to the geometry of the workpiece and depth of cut.
6) When machining inclinations in the Z direction, set the inclination angle at 2° and reduce the feed rate by 50%.
7) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VCMHDRB

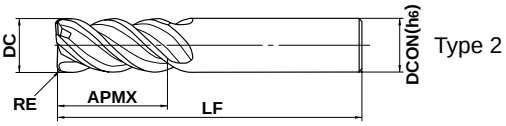
Corner radius end mill, Medium cut length, 4 flute, High helix angle

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	○	◎	◎		

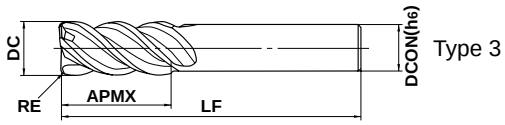




Type 1



Type 2



Type 3

DC≤12	DC>12			
0 - 0.02	0 - 0.03			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

h6

● 4 flute corner radius end mill with high helix angle for milling difficult-to-cut materials.

Unit : mm

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VCMHDRBD0200R020S04	2	0.2	6	40	4	4	★	1
VCMHDRB**D0200R030S04**	2	0.3	6	40	4	4	★	1
VCMHDRB**D0300R020S06**	3	0.2	8	50	6	4	★	1
VCMHDRB**D0300R030S06**	3	0.3	8	50	6	4	★	1
VCMHDRB**D0300R050S06**	3	0.5	8	50	6	4	★	1
VCMHDRB**D0400R020S06**	4	0.2	11	50	6	4	★	1
VCMHDRB**D0400R030S06**	4	0.3	11	50	6	4	★	1
VCMHDRB**D0400R050S06**	4	0.5	11	50	6	4	★	1
VCMHDRB**D0500R020S06**	5	0.2	13	60	6	4	★	1
VCMHDRB**D0500R030S06**	5	0.3	13	60	6	4	★	1
VCMHDRB**D0500R050S06**	5	0.5	13	60	6	4	★	1
VCMHDRB**D0500R100S06**	5	1	13	60	6	4	★	1
VCMHDRB**D0600R030S06**	6	0.3	13	60	6	4	★	2
VCMHDRB**D0600R050S06**	6	0.5	13	60	6	4	★	2
VCMHDRB**D0600R100S06**	6	1	13	60	6	4	★	2
VCMHDRB**D0800R030S08**	8	0.3	19	70	8	4	★	2
VCMHDRB**D0800R050S08**	8	0.5	19	70	8	4	★	2
VCMHDRB**D0800R100S08**	8	1	19	70	8	4	★	2
VCMHDRB**D0800R150S08**	8	1.5	19	70	8	4	★	2
VCMHDRB**D1000R030S08**	10	0.3	22	90	8	4	★	3
VCMHDRB**D1000R050S08**	10	0.5	22	90	8	4	★	3
VCMHDRB**D1000R100S08**	10	1	22	90	8	4	★	3
VCMHDRB**D1000R150S08**	10	1.5	22	90	8	4	★	3
VCMHDRB**D1000R200S08**	10	2	22	90	8	4	★	3
VCMHDRB**D1000R030S10**	10	0.3	22	90	10	4	★	2
VCMHDRB**D1000R050S10**	10	0.5	22	90	10	4	★	2
VCMHDRB**D1000R100S10**	10	1	22	90	10	4	★	2
VCMHDRB**D1000R150S10**	10	1.5	22	90	10	4	★	2
VCMHDRB**D1000R200S10**	10	2	22	90	10	4	★	2
VCMHDRB**D1200R050S10**	12	0.5	26	90	10	4	★	3
VCMHDRB**D1200R100S10**	12	1	26	90	10	4	★	3

★ : Inventory maintained in Japan.

Unit : mm

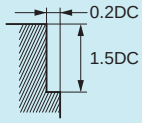
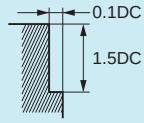
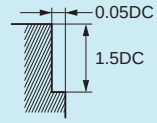
Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VCMHDRB D1200R150S10	12	1.5	26	90	10	4	★	3
VCMHDRB **D1200R200S10**	12	2	26	90	10	4	★	3
VCMHDRB **D1200R300S10**	12	3	26	90	10	4	★	3
VCMHDRB **D1200R050S12**	12	0.5	26	90	12	4	★	2
VCMHDRB **D1200R100S12**	12	1	26	90	12	4	★	2
VCMHDRB **D1200R150S12**	12	1.5	26	90	12	4	★	2
VCMHDRB **D1200R200S12**	12	2	26	90	12	4	★	2
VCMHDRB **D1200R300S12**	12	3	26	90	12	4	★	2
VCMHDRB **D1600R100S16**	16	1	32	110	16	4	★	2
VCMHDRB **D1600R150S16**	16	1.5	32	110	16	4	★	2
VCMHDRB **D1600R200S16**	16	2	32	110	16	4	★	2
VCMHDRB **D1600R300S16**	16	3	32	110	16	4	★	2
VCMHDRB **D1800R100S16**	18	1	32	110	16	4	★	3
VCMHDRB **D1800R150S16**	18	1.5	32	110	16	4	★	3
VCMHDRB **D1800R200S16**	18	2	32	110	16	4	★	3
VCMHDRB **D1800R300S16**	18	3	32	110	16	4	★	3
VCMHDRB **D2000R100S20**	20	1	38	110	20	4	★	2
VCMHDRB **D2000R150S20**	20	1.5	38	110	20	4	★	2
VCMHDRB **D2000R200S20**	20	2	38	110	20	4	★	2
VCMHDRB **D2000R300S20**	20	3	38	110	20	4	★	2
VCMHDRB **D2200R100S20**	22	1	38	140	20	4	★	3
VCMHDRB **D2200R150S20**	22	1.5	38	140	20	4	★	3
VCMHDRB **D2200R200S20**	22	2	38	140	20	4	★	3
VCMHDRB **D2200R300S20**	22	3	38	140	20	4	★	3
VCMHDRB **D2500R100S25**	25	1	45	140	25	4	★	2
VCMHDRB **D2500R150S25**	25	1.5	45	140	25	4	★	2
VCMHDRB **D2500R200S25**	25	2	45	140	25	4	★	2
VCMHDRB **D2500R300S25**	25	3	45	140	25	4	★	2

VCMHDRB

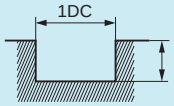
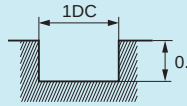
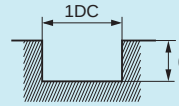
Corner radius end mill, Medium cut length, 4 flute, High helix angle

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
2	15000	550	21.7	10000	340	13.4	10000	320	12.6	6400	160	6.3	4800	100	3.9
3	11000	800	31.5	7400	500	19.7	7400	480	18.9	4800	250	9.8	4000	170	6.7
4	8000	900	35.4	5600	540	21.3	5600	520	20.5	3600	270	10.6	3200	240	9.4
5	6400	1000	39.4	4500	600	23.6	4500	580	22.8	2900	300	11.8	2600	240	9.4
6	5900	1100	43.3	3700	640	25.2	3700	600	23.6	2400	320	12.6	2100	230	9.1
8	4400	1100	43.3	2800	660	26.0	2800	600	23.6	1800	330	13.0	1600	220	8.7
10	3500	1000	39.4	2300	640	25.2	2300	560	22.0	1400	320	12.6	1300	200	7.9
12	2900	1000	39.4	1900	640	25.2	1900	530	20.9	1200	320	12.6	1100	170	6.7
16	2200	800	31.5	1400	500	19.7	1400	450	17.7	900	250	9.8	800	130	5.1
20	1800	750	29.5	1100	460	18.1	1100	440	17.3	720	230	9.1	640	100	3.9
25	1400	600	23.6	900	400	15.7	900	380	15.0	570	200	7.9	510	80	3.1
Depth of cut															

Slotting

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
2	12000	400	15.7	7000	200	7.9	7000	100	3.9	4200	80	3.1	2300	40	1.6
3	9000	600	23.6	5300	300	11.8	5300	150	5.9	3200	130	5.1	1900	70	2.8
4	7200	720	28.3	4000	360	14.2	4000	180	7.1	2400	140	5.5	1400	95	3.7
5	5800	720	28.3	3200	360	14.2	3200	180	7.1	1900	150	5.9	1100	95	3.7
6	5000	800	31.5	2700	400	15.7	2700	200	7.9	1600	160	6.3	950	95	3.7
8	3700	800	31.5	2000	400	15.7	2000	200	7.9	1200	170	6.7	720	90	3.5
10	3000	720	28.3	1600	360	14.2	1600	180	7.1	960	160	6.3	570	80	3.1
12	2500	720	28.3	1300	360	14.2	1300	180	7.1	800	160	6.3	480	70	2.8
16	2000	600	23.6	1000	280	11.0	1000	150	5.9	600	130	5.1	360	50	2.0
20	1600	540	21.3	800	250	9.8	800	130	5.1	480	120	4.7	290	40	1.6
25	1300	480	18.9	640	220	8.7	640	120	4.7	380	100	3.9	230	35	1.4
Depth of cut															

1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

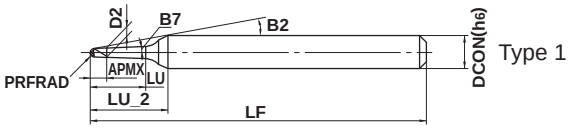
VC4STB

Ball nose taper end mill, Short cut length, 4 flute

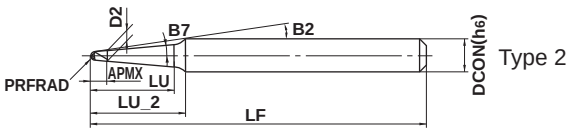
UWC VC 30° PRFRAD<0.5 PRFRAD≥0.5

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎	○	○		

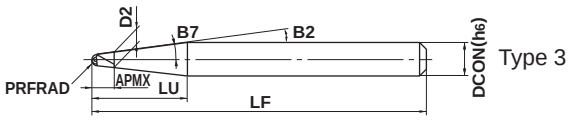




Type 1



Type 2



Type 3

★Relief Neck type.

R

0.3≤PRFRAD≤4				
±0.01				

h6

DCON=6	8≤DCON≤10			
0 - 0.008	0 - 0.009			

● The taper neck and short length of cut are adopted in order to increase the rigidity to the fullest extent, ensuring the maximum performance when machining any kind of work material.

Unit : mm

Order Number	PRFRAD	B7	APMX	LU	LU_2	D2	B2	LF	DCON	No. of Flutes	Stock	Type
VC4STBR0030T0130N05	0.3	1° 30'	1	5	9.0	0.64	17.2°	60	6	4	●	1
VC4STBR0030T0200N05	0.3	2°	1	5	9.0	0.65	17.2°	60	6	4	★	1
VC4STBR0030T0500N05	0.3	5°	1	5	8.8	0.70	17.6°	60	6	4	●	1
VC4STBR0030T1000N15	0.3	10°	1	15	—	0.90	10.4°	60	6	4	●	3
VC4STBR0040T0130N10	0.4	1° 30'	2	10	14.0	0.88	10.8°	60	6	4	★	1
VC4STBR0040T0130N15	0.4	1° 30'	2	15	19.0	0.88	8.0°	60	6	4	★	1
VC4STBR0040T0200N10	0.4	2°	2	10	14.0	0.91	10.8°	60	6	4	★	1
VC4STBR0040T0500N10	0.4	5°	2	10	13.5	1.08	11.2°	60	6	4	★	1
VC4STBR0040T0700N10	0.4	7°	7	10	12.2	2.43	12.4°	60	6	4	★	2
VC4STBR0040T1000N15	0.4	10°	3	15	—	1.73	10.1°	60	6	4	★	3
VC4STBR0050T0130N10	0.5	1° 30'	2	10	14.0	1.08	10.5°	60	6	4	●	1
VC4STBR0050T0130N15	0.5	1° 30'	2	15	19.0	1.08	7.7°	60	6	4	★	1
VC4STBR0050T0130N20	0.5	1° 30'	2	20	24.0	1.08	6.1°	60	6	4	★	1
VC4STBR0050T0200N10	0.5	2°	2	10	14.0	1.11	10.5°	60	6	4	●	1
VC4STBR0050T0200N15	0.5	2°	2	15	18.9	1.11	7.8°	60	6	4	●	1
VC4STBR0050T0200N20	0.5	2°	3	20	24.0	1.11	6.1°	60	6	4	★	1
VC4STBR0050T0500N10	0.5	5°	3	10	13.6	1.44	10.8°	60	6	4	●	1
VC4STBR0050T0500N15	0.5	5°	3	15	17.2	1.44	8.5°	60	6	4	●	2
VC4STBR0050T0500N20	0.5	5°	3	20	21.8	1.44	6.7°	60	6	4	●	2
VC4STBR0050T0700N10	0.5	7°	7	10	12.1	2.60	12.2°	60	6	4	●	2
VC4STBR0050T0700N15	0.5	7°	7	15	16.6	2.60	8.9°	60	6	4	●	2
VC4STBR0050T0700N20	0.5	7°	7	20	—	2.60	7.3°	60	6	4	●	3
VC4STBR0050T1000N14	0.5	10°	3	14	—	1.90	10.5°	60	6	4	●	3
VC4STBR0075T0200N10	0.75	2°	3	10	14.0	1.66	9.6°	60	6	4	●	1
VC4STBR0075T0500N15	0.75	5°	3	15	17.0	1.90	7.9°	60	6	4	●	2
VC4STBR0100T0130N10	1	1° 30'	4	10	13.5	2.16	9.1°	60	6	4	●	1
VC4STBR0100T0130N15	1	1° 30'	4	15	18.5	2.16	6.5°	60	6	4	●	1
VC4STBR0100T0130N20	1	1° 30'	4	20	23.5	2.16	5.1°	60	6	4	●	1
VC4STBR0100T0200N06	1	2°	4	6	8.7	2.20	14.4°	60	6	4	●	2
VC4STBR0100T0200N10	1	2°	4	10	13.8	2.20	8.9°	60	6	4	●	1
VC4STBR0100T0200N15	1	2°	4	15	17.5	2.20	6.9°	60	6	4	●	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

VC4STB

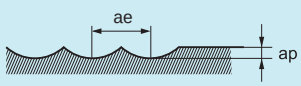
Ball nose taper end mill, Short cut length, 4 flute

Unit : mm

Order Number	PRFRAD	B7	APMX	LU	LU_2	D2	B2	LF	DCON	No. of Flutes	Stock	Type
VC4STBR0100T0500N10	1	5°	4	10	12.2	2.50	10.1°	60	6	4	●	2
VC4STB**R0100T0500N15**	1	5°	4	15	16.8	2.50	7.2°	60	6	4	●	2
VC4STB**R0100T0500N23**	1	5°	4	23	—	2.50	5.2°	60	6	4	●	3
VC4STB**R0100T0700N17**	1	7°	7	17	—	3.49	7.1°	60	6	4	●	3
VC4STB**R0100T1000N12**	1	10°	4	12	—	3.10	10.3°	60	6	4	●	3
VC4STB**R0125T0500N15**	1.25	5°	4	15	16.5	2.99	6.6°	60	6	4	●	2
VC4STB**R0150T0130N15**	1.5	1° 30'	4	15	17.3	3.13	5.4°	60	6	4	●	2
VC4STB**R0150T0130N20**	1.5	1° 30'	4	20	22.2	3.13	4.2°	60	6	4	●	2
VC4STB**R0150T0300N15**	1.5	3°	4	15	16.9	3.27	5.6°	60	6	4	●	2
VC4STB**R0150T0500N10**	1.5	5°	4	10	11.7	3.50	8.3°	60	6	4	●	2
VC4STB**R0150T0500N18**	1.5	5°	4	18	—	3.50	5.2°	60	6	4	●	3
VC4STB**R0175T0500N15**	1.75	5°	4	15	—	3.91	5.4°	60	6	4	●	3
VC4STB**R0200T0130N15**	2	1° 30'	5	15	16.8	4.16	3.9°	60	6	4	●	2
VC4STB**R0200T0130N20**	2	1° 30'	5	20	21.6	4.16	3.0°	60	6	4	●	2
VC4STB**R0200T0300N21**	2	3°	4	21	—	4.22	3.1°	60	6	4	●	3
VC4STB**R0200T0500N13**	2	5°	4	13	—	4.40	5.2°	60	6	4	●	3
VC4STB**R0200T0700N18**	2	7°	7	18	—	5.26	7.1°	60	8	4	●	3
VC4STB**R0300T0130N15**	3	1° 30'	6	15	16.8	6.16	4.2°	90	8	4	●	2
VC4STB**R0300T0130N20**	3	1° 30'	6	20	21.7	6.16	3.1°	90	8	4	●	2
VC4STB**R0300T0300N22**	3	3°	6	22	—	6.32	3.1°	90	8	4	●	3
VC4STB**R0400T0130N15**	4	1° 30'	8	15	16.9	8.21	4.4°	90	10	4	★	2
VC4STB**R0400T0300N22**	4	3°	8	22	—	8.43	3.2°	90	10	4	★	3

● : Inventory maintained. ★ : Inventory maintained in Japan.

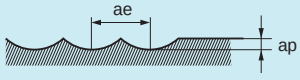
RECOMMENDED CUTTING CONDITIONS

Work material			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.					Hardened steel (45—55HRC) AISI H13 etc.					Hardened steel (55—62HRC) AISI D2 etc.				
PRFRAD (mm)	B7 (°)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
R 0.3	1.5	5	40000	1600	63.0	0.08	0.12	40000	1200	47.2	0.06	0.10	40000	700	27.6	0.04	0.06
	2	5	40000	1600	63.0	0.08	0.12	40000	1200	47.2	0.06	0.10	40000	700	27.6	0.04	0.06
	5	5	40000	1600	63.0	0.08	0.12	40000	1200	47.2	0.06	0.10	40000	700	27.6	0.04	0.06
	10	15	40000	1600	63.0	0.05	0.08	40000	1200	47.2	0.04	0.06	40000	700	27.6	0.03	0.04
R 0.4	1.5	10	40000	2000	78.7	0.07	0.11	40000	1500	59.1	0.06	0.08	30000	700	31.5	0.04	0.05
	1.5	15	40000	2000	78.7	0.05	0.08	40000	1500	59.1	0.04	0.06	30000	800	31.5	0.03	0.04
	2	10	40000	2000	78.7	0.07	0.11	40000	1500	59.1	0.06	0.08	30000	800	31.5	0.04	0.05
	5	10	40000	2000	78.7	0.07	0.11	40000	1500	59.1	0.06	0.08	30000	800	31.5	0.04	0.05
	7	10	40000	2000	78.7	0.07	0.11	40000	1500	59.1	0.06	0.08	30000	800	31.5	0.04	0.05
	10	15	40000	2000	78.7	0.06	0.09	40000	1500	59.1	0.05	0.07	30000	800	31.5	0.03	0.05
R 0.5	1.5	10	38000	2500	98.4	0.11	0.16	35000	1600	63.0	0.08	0.13	25000	800	31.5	0.05	0.08
	1.5	15	38000	2500	98.4	0.09	0.14	35000	1600	63.0	0.07	0.11	25000	800	31.5	0.05	0.07
	1.5	20	38000	2500	98.4	0.06	0.09	35000	1600	63.0	0.05	0.07	25000	800	31.5	0.03	0.05
	2	10	38000	2500	98.4	0.11	0.16	35000	1600	63.0	0.08	0.13	25000	800	31.5	0.05	0.08
	2	15	38000	2500	98.4	0.09	0.14	35000	1600	63.0	0.07	0.11	25000	800	31.5	0.05	0.07
	2	20	38000	2500	98.4	0.06	0.09	35000	1600	63.0	0.05	0.07	25000	800	31.5	0.03	0.05
	5	10	38000	2500	98.4	0.12	0.18	35000	1600	63.0	0.10	0.14	25000	800	31.5	0.06	0.09
	5	15	38000	2500	98.4	0.09	0.14	35000	1600	63.0	0.07	0.11	25000	800	31.5	0.05	0.07
	5	20	38000	2500	98.4	0.08	0.11	35000	1600	63.0	0.06	0.09	25000	800	31.5	0.04	0.06
	7	10	38000	2500	98.4	0.12	0.18	35000	1600	63.0	0.10	0.14	25000	800	31.5	0.06	0.09
	7	15	38000	2500	98.4	0.11	0.16	35000	1600	63.0	0.08	0.13	25000	800	31.5	0.05	0.08
	7	20	38000	2500	98.4	0.08	0.11	35000	1600	63.0	0.06	0.09	25000	800	31.5	0.04	0.06
	10	14	38000	2500	98.4	0.11	0.16	35000	1600	63.0	0.08	0.13	25000	800	31.5	0.05	0.08
R 0.75	2	10	38000	2500	98.4	0.18	0.27	35000	1600	63.0	0.14	0.22	18000	800	31.5	0.09	0.14
	5	15	38000	2500	98.4	0.16	0.24	35000	1600	63.0	0.13	0.19	18000	800	31.5	0.08	0.12
R 1	1.5	10	35000	2800	110.2	0.18	0.27	30000	1800	70.9	0.14	0.22	15000	1000	39.4	0.09	0.14
	1.5	15	35000	2800	110.2	0.16	0.24	30000	1800	70.9	0.13	0.19	15000	1000	39.4	0.08	0.12
	1.5	20	35000	2800	110.2	0.14	0.21	30000	1800	70.9	0.11	0.17	15000	1000	39.4	0.07	0.11
	2	6	35000	2800	110.2	0.20	0.30	30000	1800	70.9	0.16	0.24	15000	1000	39.4	0.10	0.15
	2	10	35000	2800	110.2	0.18	0.27	30000	1800	70.9	0.14	0.22	15000	1000	39.4	0.09	0.14
	2	15	35000	2800	110.2	0.16	0.24	30000	1800	70.9	0.13	0.19	15000	1000	39.4	0.08	0.12
	5	10	35000	2800	110.2	0.18	0.27	30000	1800	70.9	0.14	0.22	15000	1000	39.4	0.09	0.14
	5	15	35000	2800	110.2	0.18	0.27	30000	1800	70.9	0.14	0.22	15000	1000	39.4	0.09	0.14
	5	23	35000	2800	110.2	0.14	0.21	30000	1800	70.9	0.11	0.17	15000	1000	39.4	0.07	0.11
	7	17	35000	2800	110.2	0.16	0.24	30000	1800	70.9	0.13	0.19	15000	1000	39.4	0.08	0.12
	10	12	35000	2800	110.2	0.18	0.27	30000	1800	70.9	0.14	0.22	15000	1000	39.4	0.09	0.14
R 1.25	5	15	35000	2800	110.2	0.23	0.34	30000	1800	70.9	0.18	0.27	15000	1000	39.4	0.11	0.17
R 1.5	1.5	15	32000	3000	118.1	0.23	0.34	27000	2000	78.7	0.18	0.27	16000	1200	47.2	0.11	0.17
	1.5	20	32000	3000	118.1	0.23	0.34	27000	2000	78.7	0.18	0.27	16000	1200	47.2	0.11	0.17
	3	15	32000	3000	118.1	0.23	0.34	27000	2000	78.7	0.18	0.27	16000	1200	47.2	0.11	0.17
	5	10	32000	3000	118.1	0.25	0.38	27000	2000	78.7	0.20	0.30	16000	1200	47.2	0.13	0.19
	5	18	32000	3000	118.1	0.23	0.34	27000	2000	78.7	0.18	0.27	16000	1200	47.2	0.11	0.17
R 1.75	5	15	27500	3500	137.8	0.23	0.34	23000	2500	98.4	0.18	0.27	14000	1500	59.1	0.11	0.17
Depth of cut																	

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VC4STB

Ball nose taper end mill, Short cut length, 4 flute

Work material			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.					Hardened steel (45—55HRC) AISI H13 etc.					Hardened steel (55—62HRC) AISI D2 etc.				
PRFRAD (mm)	B7 (°)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
R 2	1.5	15	24000	3500	137.8	0.23	0.34	20000	2500	98.4	0.18	0.27	12000	1500	59.1	0.11	0.17
	1.5	20	24000	3500	137.8	0.23	0.34	20000	2500	98.4	0.18	0.27	12000	1500	59.1	0.11	0.17
	3	21	24000	3500	137.8	0.23	0.34	20000	2500	98.4	0.18	0.27	12000	1500	59.1	0.11	0.17
	5	13	24000	3500	137.8	0.25	0.38	20000	2500	98.4	0.20	0.30	12000	1500	59.1	0.13	0.19
	7	18	24000	3500	137.8	0.23	0.34	20000	2500	98.4	0.18	0.27	12000	1500	59.1	0.11	0.17
R 3	1.5	15	16000	3500	137.8	0.30	0.45	13500	2500	98.4	0.24	0.36	8000	1500	59.1	0.15	0.23
	1.5	20	16000	3500	137.8	0.30	0.45	13500	2500	98.4	0.24	0.36	8000	1500	59.1	0.15	0.23
	3	22	16000	3500	137.8	0.30	0.45	13500	2500	98.4	0.24	0.36	8000	1500	59.1	0.15	0.23
R 4	1.5	15	12000	3500	137.8	0.30	0.45	10000	2500	98.4	0.24	0.36	6000	1500	59.1	0.15	0.23
	3	22	12000	3500	137.8	0.30	0.45	10000	2500	98.4	0.24	0.36	6000	1500	59.1	0.15	0.23
Depth of cut																	

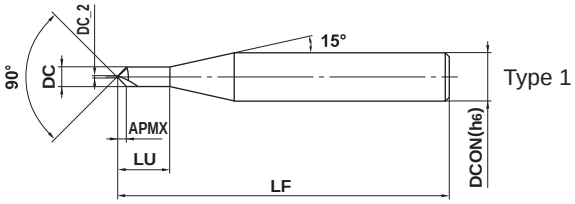
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VC2C

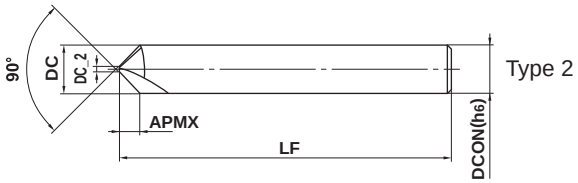
Chamfer cutter, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎	○	◎	◎	○	○





Type 1



Type 2

±0.02				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

h6

● Chamfer cutter for machining hardened steels and difficult-to-cut materials.

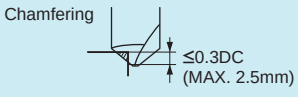
Unit : mm

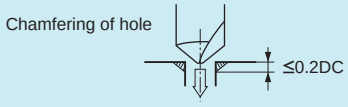
Order Number	DC	DC_2	APMX	LU	LF	DCON	No. of Flutes	Stock	Type
VC2CD0200	2	0.3	0.85	6	50	6	2	★	1
VC2CD0400	4	0.3	1.85	12	50	6	2	★	1
VC2CD0600	6	0.3	2.85	—	50	6	2	★	2
VC2CD0800	8	0.4	3.8	—	60	8	2	★	2
VC2CD1000	10	0.5	4.75	—	70	10	2	★	2
VC2CD1200	12	0.5	5.75	—	75	12	2	★	2

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
2	16000	960	37.8	11000	590	23.2	9500	460	18.1	8000	320	12.6
4	8000	480	18.9	5600	300	11.8	4800	230	9.1	4000	160	6.3
6	5300	320	12.6	3700	200	7.9	3200	150	5.9	2700	110	4.3
8	4000	240	9.4	2800	150	5.9	2400	120	4.7	2000	80	3.1
10	3200	190	7.5	2200	120	4.7	1900	90	3.5	1600	60	2.4
12	2700	160	6.3	1900	100	3.9	1600	80	3.1	1300	50	2.0

Depth of cut





1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

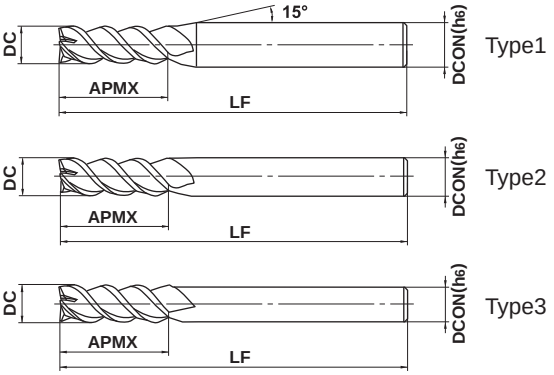
★ : Inventory maintained in Japan.

VQMHZV

End mill, Medium cut length, 3 flute for drilling and slotting

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





DC≤12	DC>12			
0 - 0.02	0 - 0.03			
h6				
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

- 3 flute end mill for drilling and slotting.
- Featuring irregular helical geometry for reducing vibration.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHZVD0100	1	2	45	4	3	●	1
VQMHZV**D0110**	1.1	2.2	45	4	3	●	1
VQMHZV**D0120**	1.2	2.4	45	4	3	●	1
VQMHZV**D0130**	1.3	2.6	45	4	3	●	1
VQMHZV**D0140**	1.4	2.8	45	4	3	●	1
VQMHZV**D0150**	1.5	3	45	4	3	●	1
VQMHZV**D0160**	1.6	3.2	45	4	3	●	1
VQMHZV**D0170**	1.7	3.4	45	4	3	●	1
VQMHZV**D0180**	1.8	3.6	45	4	3	●	1
VQMHZV**D0190**	1.9	3.8	45	4	3	●	1
VQMHZV**D0200**	2	4	50	6	3	●	1
VQMHZV**D0210**	2.1	4.2	50	6	3	●	1
VQMHZV**D0220**	2.2	4.4	50	6	3	●	1
VQMHZV**D0230**	2.3	4.6	50	6	3	●	1
VQMHZV**D0240**	2.4	4.8	50	6	3	●	1
VQMHZV**D0250**	2.5	5	50	6	3	●	1
VQMHZV**D0260**	2.6	5.2	50	6	3	●	1
VQMHZV**D0270**	2.7	5.4	50	6	3	●	1
VQMHZV**D0280**	2.8	5.6	50	6	3	●	1
VQMHZV**D0290**	2.9	5.8	50	6	3	●	1
VQMHZV**D0300**	3	6	50	6	3	●	1
VQMHZV**D0310**	3.1	7	50	6	3	●	1
VQMHZV**D0320**	3.2	7	50	6	3	●	1
VQMHZV**D0330**	3.3	7	50	6	3	●	1
VQMHZV**D0340**	3.4	7	50	6	3	●	1
VQMHZV**D0350**	3.5	8	50	6	3	●	1
VQMHZV**D0360**	3.6	8	50	6	3	●	1
VQMHZV**D0370**	3.7	8	50	6	3	●	1
VQMHZV**D0380**	3.8	8	50	6	3	●	1
VQMHZV**D0390**	3.9	8	50	6	3	●	1

Note) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHZVD0400	4	8	50	6	3	●	1
VQMHZV**D0450**	4.5	10	50	6	3	●	1
VQMHZV**D0500**	5	10	50	6	3	●	1
VQMHZV**D0550**	5.5	13	50	6	3	●	1
VQMHZV**D0600**	6	13	60	6	3	●	2
VQMHZV**D0650**	6.5	16	60	8	3	●	1
VQMHZV**D0700**	7	16	60	8	3	●	1
VQMHZV**D0750**	7.5	16	60	8	3	●	1
VQMHZV**D0800**	8	19	70	8	3	●	2
VQMHZV**D0850**	8.5	19	70	10	3	●	1
VQMHZV**D0900**	9	19	70	10	3	●	1
VQMHZV**D0950**	9.5	19	70	10	3	●	1
VQMHZV**D1000**	10	22	80	10	3	●	2
VQMHZV**D1100**	11	22	80	12	3	●	1
VQMHZV**D1200**	12	26	90	12	3	●	2
VQMHZV**D1300**	13	26	90	12	3	★	3
VQMHZV**D1400**	14	26	90	12	3	★	3
VQMHZV**D1500**	15	26	110	16	3	★	1
VQMHZV**D1600**	16	30	110	16	3	★	2
VQMHZV**D2000**	20	32	140	20	3	★	2

Note) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

VQMHZV

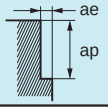
End mill, Medium cut length, 3 flute for drilling and slotting

RECOMMENDED CUTTING CONDITIONS

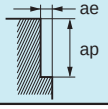
Shoulder milling

When machine rigidity, work material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, work material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	100	32000	720	1.5	0.2	80	25000	530	1.5	0.2	60	19000	430	1.5	0.2	50	16000	340	1.5	0.1
1.5	130	28000	1300	2.25	0.3	100	21000	630	2.25	0.3	85	18000	540	2.25	0.3	65	14000	420	2.25	0.15
2	150	24000	1800	3	0.6	120	19000	860	3	0.6	100	16000	620	3	0.6	75	12000	540	3	0.4
3	150	16000	1900	4.5	0.9	120	13000	940	4.5	0.9	100	11000	660	4.5	0.9	75	8000	580	4.5	0.6
4	150	12000	2000	6	1.2	120	9500	940	6	1.2	100	8000	670	6	1.2	75	6000	590	6	0.8
5	150	9500	1900	7.5	1.5	120	7600	960	7.5	1.5	100	6400	670	7.5	1.5	75	4800	600	7.5	1
6	150	8000	1900	9	1.8	120	6400	960	9	1.8	100	5300	830	9	1.8	75	4000	600	9	1.2
8	150	6000	1900	12	2.4	120	4800	1000	12	2.4	100	4000	900	12	2.4	75	3000	630	12	1.6
10	150	4800	1700	15	3	120	3800	910	15	3	100	3200	960	15	3	75	2400	580	15	2
12	150	4000	1400	18	3.6	120	3200	860	18	3.6	100	2700	890	18	3.6	75	2000	540	18	2.4
16	150	3000	1200	24	4.8	120	2400	720	24	4.8	100	2000	720	24	4.8	75	1500	450	24	3.2
20	150	2400	970	30	6	120	1900	570	30	6	100	1600	580	30	6	75	1200	360	30	4
Depth of cut																				

General purpose cutting conditions

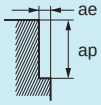
Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	100	32000	480	1.5	0.2	80	25000	350	1.5	0.2	60	19000	280	1.5	0.2	50	16000	220	1.5	0.1
1.5	120	25000	740	2.25	0.3	100	21000	420	2.25	0.3	80	17000	340	2.25	0.3	65	14000	280	2.25	0.15
2	120	19000	940	3	0.6	100	16000	480	3	0.6	80	13000	340	3	0.6	70	11000	330	3	0.4
3	120	13000	1000	4.5	0.9	100	11000	520	4.5	0.9	80	8500	340	4.5	0.9	70	7400	350	4.5	0.6
4	120	9500	1000	6	1.2	100	8000	520	6	1.2	80	6400	350	6	1.2	70	5600	370	6	0.8
5	120	7600	980	7.5	1.5	100	6400	530	7.5	1.5	80	5100	350	7.5	1.5	70	4500	370	7.5	1
6	120	6400	1000	9	1.8	100	5300	540	9	1.8	80	4200	400	9	1.8	70	3700	370	9	1.2
8	120	4800	1000	12	2.4	100	4000	550	12	2.4	80	3200	430	12	2.4	70	2800	390	12	1.6
10	120	3800	900	15	3	100	3200	510	15	3	80	2500	450	15	3	70	2200	350	15	2
12	120	3200	760	18	3.6	100	2700	480	18	3.6	80	2100	420	18	3.6	70	1900	340	18	2.4
16	120	2400	640	24	4.8	100	2000	400	24	4.8	80	1600	340	24	4.8	70	1400	280	24	3.2
20	120	1900	510	30	6	100	1600	320	30	6	80	1300	270	30	6	70	1100	220	30	4
Depth of cut																				

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
4) When the depth of cut is smaller than shown the feed rate can be increased.

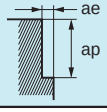
Shoulder milling

When machine rigidity, work material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, work material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Work material	Copper, Copper alloy					Heat resistant alloys Inconel718				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	120	38000	860	1.5	0.2	40	13000	160	1.5	0.05
1.5	150	32000	1400	2.25	0.3	40	8500	170	2.25	0.08
2	180	29000	2200	3	0.6	40	6400	170	3	0.2
3	180	19000	2300	4.5	0.9	40	4200	180	4.5	0.3
4	180	14000	2300	6	1.2	40	3200	180	6	0.4
5	180	11000	2300	7.5	1.5	40	2500	180	7.5	0.5
6	180	9500	2300	9	1.8	40	2100	190	9	0.6
8	180	7200	2300	12	2.4	40	1600	190	12	0.8
10	180	5700	2100	15	3	40	1300	220	15	1
12	180	4800	1700	18	3.6	40	1100	210	18	1.2
16	180	3600	1500	24	4.8	40	800	150	24	1.6
20	180	2900	1200	30	6	40	640	120	30	2
Depth of cut										

General purpose cutting conditions

Work material	Copper, Copper alloy					Heat resistant alloys Inconel718				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	120	38000	560	1.5	0.2	30	9500	75	1.5	0.05
1.5	140	30000	890	2.25	0.3	30	6400	82	2.25	0.07
2	140	22000	1100	3	0.6	30	4800	86	3	0.2
3	140	15000	1200	4.5	0.9	30	3200	89	4.5	0.3
4	140	11000	1200	6	1.2	30	2400	90	6	0.4
5	140	8900	1200	7.5	1.5	30	1900	90	7.5	0.5
6	140	7400	1200	9	1.8	30	1600	95	9	0.6
8	140	5600	1200	12	2.4	30	1200	95	12	0.8
10	140	4500	1100	15	3	30	950	110	15	1
12	140	3700	880	18	3.6	30	800	100	18	1.2
16	140	2800	750	24	4.8	30	600	76	24	1.6
20	140	2200	590	30	6	30	480	61	30	2
Depth of cut										

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

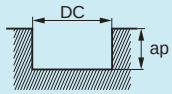
VQMHZV

End mill, Medium cut length, 3 flute for drilling and slotting

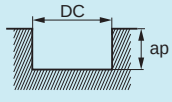
Slotting

When machine rigidity, work material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, work material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				Copper, Copper alloy				Heat resistant alloys Inconel718			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
1	100	32000	380	0.5	80	25000	150	0.5	60	19000	100	0.5	45	14000	80	0.3	120	38000	460	0.5	30	9500	60	0.2
1.5	130	28000	590	0.75	100	21000	250	0.75	85	18000	220	0.75	60	12000	140	0.4	150	32000	670	0.75	30	6400	80	0.3
2	150	24000	940	2	120	19000	460	2	100	16000	480	2	60	9500	230	1	180	29000	1100	2	30	4800	100	0.6
3	150	16000	1100	3	120	13000	550	3	100	11000	500	3	60	6400	270	1.5	180	19000	1300	3	30	3200	120	0.9
4	150	12000	1400	4	120	9500	680	4	100	8000	530	4	60	4800	350	2	180	14000	1700	4	30	2400	130	1.2
5	150	9500	1400	5	120	7600	680	5	100	6400	540	5	60	3800	350	2.5	180	11000	1700	5	30	1900	130	1.5
6	150	8000	1400	6	120	6400	770	6	100	5300	560	6	60	3200	380	3	180	9500	1700	6	30	1600	130	1.8
8	150	6000	1300	8	120	4800	720	8	100	4000	600	8	60	2400	360	4	180	7200	1500	8	30	1200	140	2.4
10	150	4800	1200	10	120	3800	630	10	100	3200	670	10	60	1900	310	5	180	5700	1400	10	30	950	160	3
12	150	4000	960	12	120	3200	580	12	100	2700	650	12	60	1600	290	6	180	4800	1200	12	30	800	150	3.6
16	150	3000	810	12	120	2400	500	12	100	2000	480	12	60	1200	250	8	180	3600	970	12	30	600	120	4.8
20	150	2400	650	12	120	1900	400	12	100	1600	380	12	60	950	200	10	180	2900	780	12	30	480	90	6
Depth of cut																								

General purpose cutting conditions

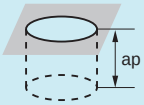
Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				Copper, Copper alloy				Heat resistant alloys Inconel718			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
1	100	32000	250	0.5	80	25000	99	0.5	60	19000	80	0.5	45	14000	60	0.3	120	38000	300	0.5	25	8000	30	0.2
1.5	100	21000	290	0.75	80	17000	130	0.75	60	13000	100	0.75	50	11000	87	0.4	120	25000	350	0.75	25	5300	40	0.3
2	100	16000	410	2	80	13000	210	2	60	9500	190	2	50	8000	130	1	120	19000	490	2	25	4000	55	0.6
3	100	11000	500	3	80	8500	240	3	60	6400	190	3	50	5300	150	1.5	120	13000	590	3	25	2700	64	0.9
4	100	8000	630	4	80	6400	300	4	60	4800	210	4	50	4000	190	2	120	9500	750	4	25	2000	70	1.2
5	100	6400	630	5	80	5100	300	5	60	3800	210	5	50	3200	190	2.5	120	7600	750	5	25	1600	71	1.5
6	100	5300	630	6	80	4200	330	6	60	3200	220	6	50	2700	210	3	120	6400	760	6	25	1300	72	1.8
8	100	4000	550	8	80	3200	320	8	60	2400	240	8	50	2000	200	4	120	4800	670	8	25	990	78	2.4
10	100	3200	510	10	80	2500	270	10	60	1900	260	10	50	1600	170	5	120	3800	600	10	25	800	89	3
12	100	2700	430	12	80	2100	250	12	60	1600	250	12	50	1300	150	6	120	3200	510	12	25	660	84	3.6
16	100	2000	360	12	80	1600	220	12	60	1200	190	12	50	990	140	8	120	2400	430	12	25	500	63	4.8
20	100	1600	290	12	80	1300	180	12	60	950	150	12	50	800	110	10	120	1900	340	12	25	400	50	6
Depth of cut																								

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
4) When the depth of cut is smaller than shown the feed rate can be increased.

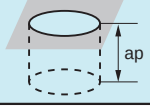
Plunging

When machine rigidity, work material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, work material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631					Copper, Copper alloy				
DC (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)
1	65	20000	160	0.5	0.1	50	16000	100	0.5	0.1	50	16000	50	0.5	0.05	30	9500	30	0.5	0.05	75	24000	190	0.5	0.1
1.5	85	18000	270	0.75	0.3	60	13000	120	0.75	0.3	60	13000	80	0.75	0.1	35	7400	40	0.75	0.1	100	21000	320	0.75	0.3
2	100	16000	480	2	0.5	70	11000	200	2	0.4	60	9500	90	1	0.15	40	6400	60	1	0.1	120	19000	570	2	0.5
3	100	11000	660	3	1	70	7400	270	3	0.6	60	6400	100	1.5	0.2	40	4200	60	1.5	0.2	120	13000	780	3	1.0
4	100	8000	800	4	2	70	5600	340	4	0.8	60	4800	100	2	0.4	40	3200	60	2	0.4	120	9500	950	4	2
5	100	6400	960	5	2.5	70	4500	410	5	1	60	3800	100	2.5	0.5	40	2500	60	2.5	0.5	120	7600	1100	5	2.5
6	100	5300	950	6	3	70	3700	440	6	1.2	60	3200	100	3	0.6	40	2100	60	3	0.6	120	6400	1200	6	3
8	100	4000	720	8	4	70	2800	340	8	1.6	60	2400	70	4	0.6	40	1600	50	4	0.6	120	4800	860	8	4
10	100	3200	580	10	5	70	2200	260	10	2.5	60	1900	60	5	0.6	40	1300	40	5	0.6	120	3800	680	10	5
12	100	2700	490	12	5	70	1900	230	12	3	60	1600	50	6	0.6	40	1100	30	6	0.6	120	3200	580	12	5
16	100	2000	360	16	5	70	1400	170	16	4	60	1200	40	8	0.6	40	800	20	8	0.6	120	2400	430	16	5
20	100	1600	290	20	5	70	1100	130	20	5	60	950	30	10	0.6	40	640	20	10	0.6	120	1900	340	20	5
Depth of cut																									

General purpose cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631					Copper, Copper alloy				
DC (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)
1	65	20000	160	0.5	0.05	50	16000	100	0.5	0.05	50	16000	50	0.5	0.05	30	9500	30	0.5	0.05	75	24000	190	0.5	0.05
1.5	85	18000	270	0.75	0.15	60	13000	120	0.75	0.1	60	13000	80	0.75	0.05	35	7400	40	0.75	0.05	100	21000	320	0.75	0.15
2	100	16000	480	2	0.25	70	11000	200	2	0.2	60	9500	90	1	0.05	40	6400	60	1	0.05	120	19000	570	2	0.25
3	100	11000	660	3	0.3	70	7400	270	3	0.3	60	6400	100	1.5	0.1	40	4200	60	1.5	0.1	120	13000	780	3	0.3
4	100	8000	800	4	0.4	70	5600	340	4	0.4	60	4800	100	2	0.2	40	3200	60	2	0.2	120	9500	950	4	0.4
5	100	6400	960	5	0.5	70	4500	410	5	0.5	60	3800	100	2.5	0.25	40	2500	60	2.5	0.25	120	7600	1100	5	0.5
6	100	5300	950	6	0.6	70	3700	440	6	0.6	60	3200	100	3	0.3	40	2100	60	3	0.3	120	6400	1200	6	0.6
8	100	4000	720	8	0.7	70	2800	340	8	0.7	60	2400	70	4	0.3	40	1600	50	4	0.3	120	4800	860	8	0.7
10	100	3200	580	10	0.75	70	2200	260	10	0.75	60	1900	60	5	0.3	40	1300	40	5	0.3	120	3800	680	10	0.75
12	100	2700	490	12	0.75	70	1900	230	12	0.75	60	1600	50	6	0.3	40	1100	30	6	0.3	120	3200	580	12	0.75
16	100	2000	360	16	0.75	70	1400	170	16	0.75	60	1200	40	8	0.3	40	800	20	8	0.3	120	2400	430	16	0.75
20	100	1600	290	20	0.75	70	1100	130	20	0.75	60	950	30	10	0.3	40	640	20	10	0.3	120	1900	340	20	0.75
Depth of cut																									

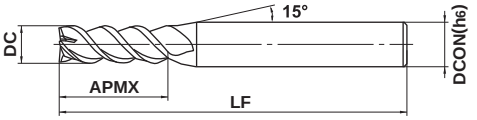
1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient.
In these cases the feed and speed should be reduced proportionately.

VQMHZV – Inch sizes

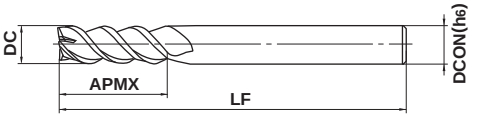
End mill, Medium cut length, 3 flute for drilling and slotting

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





Type1



Type2

DC<.5000"	DC=.5000"			
0 - .0008"	0 - .0012"			
.2500"≤DCON≤.3750"	DCON=.5000"			
0 - .00035"	0 - .00043"			

- 3 flute end mill for drilling and slotting.
- Featuring irregular helical geometry for reducing vibration.

Unit : inch

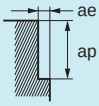
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHZVD1/16	.0625	.1250	2.0	.2500	3	●	1
VQMHZV**D5/64**	.0781	.1560	2.0	.2500	3	●	1
VQMHZV**D3/32**	.0938	.1880	2.0	.2500	3	●	1
VQMHZV**D7/64**	.1094	.2500	2.0	.2500	3	●	1
VQMHZV**D1/8**	.1250	.3130	2.0	.2500	3	●	1
VQMHZV**D5/32**	.1563	.3750	2.0	.2500	3	●	1
VQMHZV**D3/16**	.1875	.4375	2.0	.2500	3	●	1
VQMHZV**D1/4**	.2500	.6250	2.5	.2500	3	●	2
VQMHZV**D5/16**	.3125	.7500	2.75	.3125	3	●	2
VQMHZV**D11/32**	.3438	.7500	3.0	.3750	3	●	1
VQMHZV**D3/8**	.3750	.8750	3.0	.3750	3	●	2
VQMHZV**D1/2**	.5000	1.1250	3.5	.5000	3	●	2

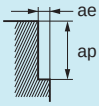
Note) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

● : Inventory maintained.

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Carbon steel (—30HRC) AISI 1035, AISI 1050, ASTM 283						Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21						Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.					
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)			Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)			Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		
1/16	26000	55.3	24000	33.9	.094	.013	20000	26.0	20000	17.3	.094	.013	18000	23.4	16000	13.8	.094	.013
5/64	24000	70.9	19000	37.0	.12	.023	19000	33.7	16000	18.9	.12	.023	16000	24.6	13000	13.0	.12	.023
3/32	20000	70.9	16000	37.4	.14	.028	16000	34.0	13000	18.1	.14	.028	13000	24.6	11000	13.8	.14	.028
7/64	17000	72.3	14000	39.4	.16	.033	14000	34.7	11000	18.1	.16	.033	11000	24.7	9200	13.8	.16	.033
1/8	15000	76.2	12000	39.4	.19	.038	12000	36.9	10000	20.1	.19	.038	10000	26.0	8000	13.8	.19	.038
5/32	12000	78.0	9600	39.4	.23	.047	9600	37.4	8000	20.5	.23	.047	8000	26.5	6400	13.8	.23	.047
3/16	10000	74.4	8000	39.4	.28	.056	8000	37.8	6700	20.9	.28	.056	6700	26.5	5300	13.8	.28	.056
1/4	7500	74.4	6000	39.4	.38	.075	6000	39.0	5000	21.3	.38	.075	5000	35.4	4000	18.9	.38	.075
5/16	6000	74.4	4800	39.4	.47	.094	4800	39.7	4000	21.7	.47	.094	4000	35.4	3200	18.9	.47	.094
11/32	5500	71.5	4400	37.8	.52	.10	4400	37.9	3600	20.5	.52	.10	3600	36.1	2900	19.3	.52	.10
3/8	5000	67.9	4000	35.8	.56	.11	4000	36.9	3300	20.1	.56	.11	3300	37.0	2700	20.1	.56	.11
1/2	3800	56.1	3000	29.1	.75	.15	3000	32.6	2500	18.1	.75	.15	2500	32.5	2000	17.3	.75	.15
Depth of cut																		

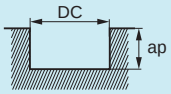
Work material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.						Copper, Copper alloy						Heat resistant alloy Inconel718 etc.					
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)			Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)			Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		
1/16	13000	16.9	13000	11.0	.094	.0063	30000	63.8	28000	39.4	.094	.013	8000	3.3	6000	13.8	.094	.0031
5/64	12000	21.3	11000	13.0	.12	.016	29000	85.6	22000	43.3	.12	.023	6400	3.4	4800	13.0	.12	.0078
3/32	10000	21.3	9400	13.4	.14	.019	24000	85.0	19000	43.3	.14	.028	5300	3.4	4000	13.8	.14	.0094
7/64	8600	21.3	8000	13.0	.16	.022	21000	89.3	16000	43.3	.16	.033	4600	3.5	3400	13.8	.16	.011
1/8	7500	23.0	7000	14.2	.19	.025	18000	91.4	14000	47.2	.19	.038	4000	3.5	3000	13.8	.19	.013
5/32	6000	23.4	5600	14.6	.23	.031	14000	90.9	11000	47.2	.23	.047	3200	3.5	2400	13.8	.23	.016
3/16	5000	23.6	4700	14.6	.28	.038	12000	89.3	9400	47.2	.28	.056	2700	3.6	2000	13.8	.28	.019
1/4	3800	24.7	3500	15.0	.38	.050	9000	89.3	7000	47.2	.38	.075	2000	3.7	1500	18.9	.38	.025
5/16	3000	24.8	2800	15.4	.47	.063	7200	89.3	5600	47.2	.47	.094	1600	3.7	1200	18.9	.47	.031
11/32	2700	23.3	2600	15.0	.52	.069	6600	85.7	5100	43.3	.52	.10	1500	3.9	1100	19.3	.52	.034
3/8	2500	23.0	2300	14.2	.56	.075	6000	81.5	4700	43.3	.56	.11	1300	3.9	1000	20.1	.56	.038
1/2	1900	20.6	1800	13.0	.75	.10	4500	66.4	3500	34.3	.75	.15	1000	3.7	750	17.3	.75	.050
Depth of cut																		

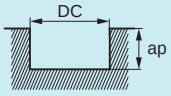
1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, and titanium alloy can be achieved with the use of water-soluble cutting fluid.
3) Higher feeds and speeds can be used for smaller depth of cut.
4) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

VQMHZV – Inch sizes

End mill, Medium cut length, 3 flute for drilling and slotting

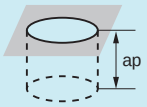
Slotting

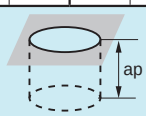
Work material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283					Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21					Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)	
1/16	26000	27.6	20000	14.2	.031	20000	11.8	16000	6.3	.031	18000	10.6	12000	4.7	.031
5/64	24000	36.9	16000	16.1	.078	19000	18.0	13000	8.3	.078	16000	18.9	9600	7.5	.078
3/32	20000	37.8	13000	16.1	.094	16000	18.9	11000	8.7	.094	13000	19.2	8000	7.9	.094
7/64	17000	40.2	11000	17.3	.11	14000	19.8	9200	8.7	.11	11000	19.5	6900	7.9	.11
1/8	15000	44.3	10000	19.7	.13	12000	22.7	8000	9.8	.13	10000	20.1	6000	7.9	.13
5/32	12000	56.7	8000	24.8	.16	9600	26.1	6400	11.4	.16	8000	20.8	4800	8.3	.16
3/16	10000	56.7	6700	25.2	.19	8000	26.9	5300	11.8	.19	6700	21.4	4000	8.3	.19
1/4	7500	55.8	5000	24.4	.25	6000	29.8	4000	13.0	.25	5000	21.9	3000	8.7	.25
5/16	6000	49.6	4000	21.7	.31	4800	28.3	3200	12.6	.31	4000	23.6	2400	9.4	.31
11/32	5500	48.7	3600	20.9	.34	4400	27.0	2900	11.8	.34	3600	24.2	2200	9.8	.34
3/8	5000	46.1	3300	20.1	.38	4000	25.5	2700	11.4	.38	3300	25.3	2000	10.2	.38
1/2	3800	35.9	2500	15.7	.50	3000	22.3	2000	9.8	.50	2500	23.6	1500	9.4	.50
Depth of cut															

Work material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.					Copper, Copper alloy					Heat resistant alloy Inconel718 etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)	
1/16	11000	6.5	10000	3.9	.019	30000	31.9	24000	16.9	.031	6000	3.5	5000	2.0	.013
5/64	9600	9.1	8000	5.1	.039	29000	44.5	19000	19.3	.078	4800	4.0	4000	2.2	.023
3/32	8000	9.5	6700	5.1	.047	24000	45.4	16000	20.1	.094	4000	4.3	3300	2.3	.028
7/64	6900	9.8	5700	5.5	.055	21000	49.6	14000	21.7	.11	3400	4.4	2900	2.5	.033
1/8	6000	11.3	5000	6.3	.063	18000	53.1	12000	23.2	.13	3000	4.6	2500	2.5	.038
5/32	4800	13.0	4000	7.1	.078	14000	66.1	9600	29.9	.16	2400	5.0	2000	2.8	.047
3/16	4000	13.7	3300	7.5	.094	12000	68.0	8000	29.9	.19	2000	5.1	1700	2.9	.056
1/4	3000	14.9	2500	8.3	.13	9000	67.0	6000	29.5	.25	1500	5.3	1300	3.0	.075
5/16	2400	14.2	2000	7.9	.16	7200	59.5	4800	26.4	.31	1200	5.7	1000	3.1	.094
11/32	2200	13.5	1800	7.5	.17	6600	58.5	4400	25.6	.34	1100	5.9	910	3.2	.10
3/8	2000	12.8	1700	7.1	.19	6000	55.3	4000	24.4	.38	1000	6.1	840	3.4	.11
1/2	1500	11.2	1300	6.3	.25	4500	42.5	3000	18.9	.50	750	5.7	630	3.1	.15
Depth of cut															

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloy, and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
3) Higher feeds and speeds can be used for smaller depth of cut.
4) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

Drilling

Work material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283							Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21							Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.						
DC (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)
	Revolution (min-1)	Feed rate (IPM)	Step (inch)	Revolution (min-1)	Feed rate (IPM)	Step (inch)		Revolution (min-1)	Feed rate (IPM)	Step (inch)	Revolution (min-1)	Feed rate (IPM)	Step (inch)		Revolution (min-1)	Feed rate (IPM)	Step (inch)	Revolution (min-1)	Feed rate (IPM)	Step (inch)	
1/16	18000	12.8	.013	18000	12.6	.006	.031	12000	5.2	.013	12000	5.2	.006	.031	12000	3.3	.004	12000	3.3	.002	.031
5/64	16000	18.9	.020	16000	18.9	.006	.078	11000	7.8	.016	11000	7.8	.006	.078	9600	3.5	.004	9600	3.5	.002	.039
3/32	13000	20.5	.023	13000	20.5	.010	.094	9400	8.8	.019	9400	8.8	.010	.094	8000	3.5	.006	8000	3.5	.002	.047
7/64	11000	21.7	.033	11000	21.7	.010	.11	8000	9.4	.022	8000	9.4	.010	.11	6900	3.5	.008	6900	3.5	.002	.055
1/8	10000	27.6	.044	10000	27.6	.012	.13	7000	11.0	.025	7000	11.0	.012	.13	6000	4.0	.008	6000	4.0	.004	.063
5/32	8000	31.5	.078	8000	31.5	.012	.16	5600	13.2	.031	5600	13.2	.012	.16	4800	3.8	.016	4800	3.8	.004	.078
3/16	6700	34.3	.094	6700	34.3	.016	.19	4700	15.0	.038	4700	15.0	.016	.19	4000	3.8	.020	4000	3.8	.008	.094
1/4	5000	35.4	.13	5000	35.4	.024	.25	3500	16.5	.050	3500	16.5	.024	.25	3000	3.5	.024	3000	3.5	.012	.13
5/16	4000	28.3	.16	4000	28.3	.028	.31	2800	13.2	.063	2800	13.2	.028	.31	2400	2.8	.024	2400	2.8	.012	.16
11/32	3600	25.5	.17	3600	25.5	.028	.34	2600	12.3	.069	2600	12.3	.028	.34	2200	2.6	.024	2200	2.6	.012	.17
3/8	3300	23.4	.19	3300	23.4	.030	.38	2300	11.0	.094	2300	11.0	.030	.38	2000	2.3	.024	2000	2.3	.012	.19
1/2	2500	17.7	.20	2500	17.7	.030	.50	1800	8.5	.13	1800	8.5	.030	.50	1500	2.0	.024	1500	2.0	.012	.25
Hole depth																					

Work material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.							Copper, Copper alloy						
DC (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)
	Revolution (min-1)	Feed rate (IPM)	Step (inch)	Revolution (min-1)	Feed rate (IPM)	Step (inch)		Revolution (min-1)	Feed rate (IPM)	Step (inch)	Revolution (min-1)	Feed rate (IPM)	Step (inch)	
1/16	7000	2.0	.004	7000	2.0	.002	.031	22000	15.6	.013	22000	15.6	.006	.031
5/64	6400	2.4	.004	6400	2.4	.002	.039	19000	22.4	.020	19000	22.4	.006	.039
3/32	5300	2.4	.006	5300	2.4	.002	.047	16000	25.2	.023	16000	25.2	.010	.047
7/64	4600	2.4	.008	4600	2.4	.002	.055	14000	27.6	.033	14000	27.6	.010	.055
1/8	4000	2.8	.008	4000	2.8	.004	.063	12000	33.1	.044	12000	33.1	.012	.063
5/32	3200	2.4	.016	3200	2.4	.004	.078	9600	37.8	.078	9600	37.8	.012	.078
3/16	2700	2.4	.020	2700	2.4	.008	.094	8000	39.4	.094	8000	39.4	.016	.094
1/4	2000	2.4	.024	2000	2.4	.012	.13	6000	43.3	.130	6000	43.3	.024	.13
5/16	1600	2.0	.024	1600	2.0	.012	.16	4800	33.9	.160	4800	33.9	.028	.16
11/32	1500	1.8	.024	1500	1.8	.012	.17	4400	31.1	.17	4400	31.1	.028	.17
3/8	1300	1.5	.024	1300	1.5	.012	.19	4000	28.3	.19	4000	28.3	.030	.19
1/2	1000	1.2	.024	1000	1.2	.012	.25	3000	21.3	.20	3000	21.3	.030	.25
Hole depth														

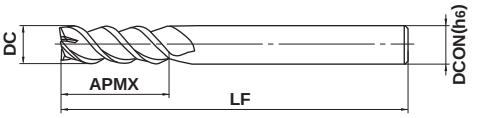
1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, and titanium alloy can be achieved with the use of water-soluble cutting fluid.
3) Higher feeds and speeds can be used for smaller depth of cut.
4) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

VQMHZVOH

End mill, Medium cut length, 3 flute for drilling and slotting with coolant holes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





Type1

DC≤12	DC=16			
0 - 0.02	0 - 0.03			
DCON=6	8≤DCON≤10	12≤DCON≤16		
0 - 0.008	0 - 0.009	0 - 0.011		

- 3 flute end mill for drilling and slotting.
- The through coolant holes add stability to drilling and pocket machining.
- Featuring irregular helical geometry for reducing vibration.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHZVOHD0600	6	13	60	6	3	●	1
VQMHZVOH**D0800**	8	19	70	8	3	●	1
VQMHZVOH**D1000**	10	22	80	10	3	●	1
VQMHZVOH**D1200**	12	26	90	12	3	●	1
VQMHZVOH**D1600**	16	30	110	16	3	★	1

Note) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

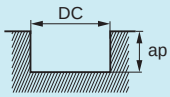
● : Inventory maintained. ★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

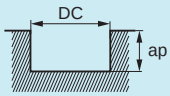
Slotting

When machine rigidity, work material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, work material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				Copper, Copper alloy				Heat resistant alloys Inconel718			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
6	150	8000	1400	6	120	6400	770	6	100	5300	560	6	60	3200	380	3	180	9500	1700	6	30	1600	130	1.8
8	150	6000	1300	8	120	4800	720	8	100	4000	600	8	60	2400	360	4	180	7200	1500	8	30	1200	140	2.4
10	150	4800	1200	10	120	3800	630	10	100	3200	670	10	60	1900	310	5	180	5700	1400	10	30	950	160	3
12	150	4000	960	12	120	3200	580	12	100	2700	650	12	60	1600	290	6	180	4800	1200	12	30	800	150	3.6
16	150	3000	810	12	120	2400	500	12	100	2000	480	12	60	1200	250	8	180	3600	970	12	30	600	120	4.8
Depth of cut																								

General purpose cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				Copper, Copper alloy				Heat resistant alloys Inconel718			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
6	100	5300	630	6	80	4200	330	6	60	3200	220	6	50	2700	210	3	120	6400	760	6	25	1300	72	1.8
8	100	4000	550	8	80	3200	320	8	60	2400	240	8	50	2000	200	4	120	4800	670	8	25	990	78	2.4
10	100	3200	510	10	80	2500	270	10	60	1900	260	10	50	1600	170	5	120	3800	600	10	25	800	89	3
12	100	2700	430	12	80	2100	250	12	60	1600	250	12	50	1300	150	6	120	3200	510	12	25	660	84	3.6
16	100	2000	360	12	80	1600	220	12	60	1200	190	12	50	990	140	8	120	2400	430	12	25	500	63	4.8
Depth of cut																								

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work.
   When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient.
   In these cases the feed and speed should be reduced proportionately.
4) When the depth of cut is smaller than shown the feed rate can be increased.

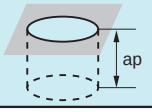
VQMHZVOH

End mill, Medium cut length, 3 flute for drilling and slotting with coolant holes

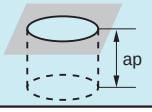
Plunging

When machine rigidity, work material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, work material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631					Copper, Copper alloy				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)
6	100	5300	950	9	3	70	3700	440	9	1.2	60	3200	100	6	0.6	40	2100	60	6	0.6	120	6400	1200	9	3
8	100	4000	720	12	4	70	2800	340	12	1.6	60	2400	70	8	0.6	40	1600	50	8	0.6	120	4800	860	12	4
10	100	3200	580	15	5	70	2200	260	15	2.5	60	1900	60	10	0.6	40	1300	40	10	0.6	120	3800	680	15	5
12	100	2700	490	18	5	70	1900	230	18	3	60	1600	50	12	0.6	40	1100	30	12	0.6	120	3200	580	18	5
16	100	2000	360	24	5	70	1400	170	24	4	60	1200	40	16	0.6	40	800	20	16	0.6	120	2400	430	24	5
Depth of cut																									

General purpose cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631					Copper, Copper alloy				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)
6	100	5300	950	9	0.6	70	3700	440	9	0.6	60	3200	100	6	0.3	40	2100	60	6	0.3	120	6400	1200	9	0.6
8	100	4000	720	12	0.7	70	2800	340	12	0.7	60	2400	70	8	0.3	40	1600	50	8	0.3	120	4800	860	12	0.7
10	100	3200	580	15	0.75	70	2200	260	15	0.75	60	1900	60	10	0.3	40	1300	40	10	0.3	120	3800	680	15	0.75
12	100	2700	490	18	0.75	70	1900	230	18	0.75	60	1600	50	12	0.3	40	1100	30	12	0.3	120	3200	580	18	0.75
16	100	2000	360	24	0.75	70	1400	170	24	0.75	60	1200	40	16	0.3	40	800	20	16	0.3	120	2400	430	24	0.75
Depth of cut																									

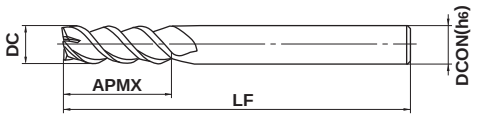
1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

VQMHZVOH – Inch sizes NEW

End mill, Medium cut length, 3 flute for drilling and slotting with coolant holes

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





Type1

DC<.5000"	DC=.5000"				
0 - .0008"	0 - .0012"				
.250"≤DCON≤.375"	DCON=.500"				
0 - .00035"	0 - .00043"				

h6

- 3 flute end mill for drilling and slotting.
- The through coolant holes add stability to drilling and pocket machining.
- Featuring irregular helical geometry for reducing vibration.

Unit : inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHZVOHD1/4	.2500	.6252	2.5	.2500	3	●	1
VQMHZVOH**D5/16**	.3125	.7500	2.75	.3125	3	●	1
VQMHZVOH**D3/8**	.3750	.8752	3.0	.3750	3	●	1
VQMHZVOH**D1/2**	.5000	1.1252	3.5	.5000	3	●	1

Note) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

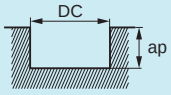
● : Inventory maintained.

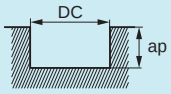
VQMHZVOH – Inch sizes NEW

End mill, Medium cut length, 3 flute for drilling and slotting with coolant holes

RECOMMENDED CUTTING CONDITIONS

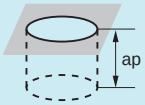
Slotting

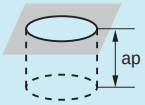
Work material	Carbon steel (–30HRC) AISI 1035, AISI 1050, ASTM 283					Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21					Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)	
1/4	7500	55.8	5000	24.4	.25	6000	29.8	5000	16.5	.25	5000	21.9	3000	8.7	.25
5/16	6000	49.6	4000	21.7	.31	4800	28.3	4000	15.7	.31	4000	23.6	2400	9.4	.31
3/8	5000	46.1	3300	20.1	.38	4000	25.5	3300	13.8	.38	3300	25.3	2000	10.2	.38
1/2	3800	35.9	2500	15.7	.50	3000	22.3	2500	12.2	.50	2500	23.6	1500	9.4	.50
Depth of cut															

Work material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.					Copper, Copper alloy					Heat resistant alloy Inconel718 etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)	
1/4	3000	14.9	2500	8.3	.25	9000	67.0	6000	29.5	.25	1500	5.3	1300	3.0	.075
5/16	2400	14.2	2000	7.9	.31	7200	59.5	4800	26.4	.31	1200	5.7	1000	3.1	.094
3/8	2000	12.8	1700	7.1	.38	6000	55.3	4000	24.4	.38	1000	6.1	840	3.4	.11
1/2	1500	11.2	1300	6.3	.50	4500	42.5	3000	18.9	.50	750	5.7	630	3.1	.15
Depth of cut															

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloy, and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
3) Higher feeds and speeds can be used for smaller depth of cut.
4) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

Plunging

Work material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283							Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21							Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.						
DC (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Step (inch)	Revolution (min^{-1})	Feed rate (IPM)	Step (inch)		Revolution (min^{-1})	Feed rate (IPM)	Step (inch)	Revolution (min^{-1})	Feed rate (IPM)	Step (inch)		Revolution (min^{-1})	Feed rate (IPM)	Step (inch)	Revolution (min^{-1})	Feed rate (IPM)	Step (inch)	
1/4	5000	35.4	.13	5000	35.4	.024	.38	3500	16.5	.050	3500	16.5	.024	.38	3000	3.5	.024	3000	3.5	.012	.38
5/16	4000	28.3	.16	4000	28.3	.028	.47	2800	13.2	.063	2800	13.2	.028	.47	2400	2.8	.024	2400	2.8	.012	.47
3/8	3300	23.4	.19	3300	23.4	.030	.56	2300	11.0	.094	2300	11.0	.030	.56	2000	2.3	.024	2000	2.3	.012	.56
1/2	2500	17.7	.20	2500	17.7	.030	.75	1800	8.5	.13	1800	8.5	.030	.75	1500	2.0	.024	1500	2.0	.012	.75
Hole depth																					

Work material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.							Copper, Copper alloy						
DC (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Step (inch)	Revolution (min^{-1})	Feed rate (IPM)	Step (inch)		Revolution (min^{-1})	Feed rate (IPM)	Step (inch)	Revolution (min^{-1})	Feed rate (IPM)	Step (inch)	
1/4	2000	2.3	.024	2000	2.3	.012	.38	6000	42.5	.13	6000	42.5	.0024	.38
5/16	1600	2.0	.024	1600	2.0	.012	.47	4800	34.0	.16	4800	34.0	.0028	.47
3/8	1300	1.5	.024	1300	1.5	.012	.56	4000	28.3	.19	4000	28.3	.003	.56
1/2	1000	1.2	.024	1000	1.2	.012	.75	3000	21.3	.20	3000	21.3	.003	.75
Hole depth														

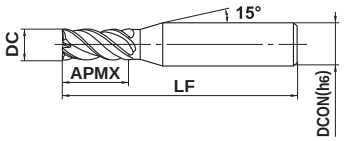
1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloy, and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
3) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

VQMHV

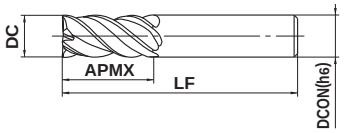
End mill, Medium cut length, 4 flute, Irregular helix flutes

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	

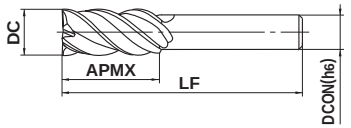




Type1



Type2



Type3

DC≤12	DC>12			
0 - 0.02	0 - 0.03			
4≤DCON≤6	**8≤DCON≤10**	**12≤DCON≤16**	**20≤DCON≤25**	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

h6

- SMART MIRACLE vibration control end mills for reduced chattering and for delivering stable performance on difficult-to-cut materials and long overhang applications.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVD0200	2	4	45	4	4	●	1
VQMHV**D0250**	2.5	5	45	4	4	●	1
VQMHV**D0300**	3	8	45	6	4	●	1
VQMHV**D0350**	3.5	8	45	6	4	●	1
VQMHV**D0400**	4	11	45	6	4	●	1
VQMHV**D0500**	5	13	50	6	4	●	1
VQMHV**D0600**	6	13	50	6	4	●	2
VQMHV**D0700**	7	19	60	8	4	●	1
VQMHV**D0800**	8	19	60	8	4	●	2
VQMHV**D0900**	9	22	70	10	4	●	1
NEW VQMHV**D0900S08**	9	22	75	8	4	●	3
VQMHV**D1000**	10	22	70	10	4	●	2
NEW VQMHV**D1000S08**	10	22	100	8	4	●	3
VQMHV**D1100**	11	26	75	12	4	●	1
NEW VQMHV**D1100S10**	11	26	100	10	4	●	3
VQMHV**D1200**	12	26	75	12	4	●	2
NEW VQMHV**D1200S10**	12	26	110	10	4	●	3
VQMHV**D1300**	13	26	75	12	4	★	3
NEW VQMHV**D1300S12**	13	26	110	12	4	★	3
VQMHV**D1400**	14	30	90	16	4	★	1
NEW VQMHV**D1400S12**	14	32	130	12	4	★	3
VQMHV**D1600**	16	35	90	16	4	★	2
VQMHV**D1800**	18	40	100	16	4	★	3
NEW VQMHV**D1800S16**	18	42	150	16	4	★	3
VQMHV**D2000**	20	45	110	20	4	★	2
VQMHV**D2500**	25	55	125	25	4	★	2

Note) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

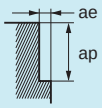
● : Inventory maintained. ★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

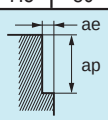
Shoulder milling

When machine rigidity, work material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, work material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
2	150	24000	2400	3	0.6	120	19000	1100	3	0.6	100	16000	830	3	0.6	75	12000	720	3	0.4
3	150	16000	2600	4.5	0.9	120	13000	1200	4.5	0.9	100	11000	880	4.5	0.9	75	8000	770	4.5	0.6
4	150	12000	2600	6	1.2	120	9500	1300	6	1.2	100	8000	900	6	1.2	75	6000	790	6	0.8
5	150	9500	2600	7.5	1.5	120	7600	1300	7.5	1.5	100	6400	900	7.5	1.5	75	4800	810	7.5	1
6	150	8000	2600	9	1.8	120	6400	1300	9	1.8	100	5300	1100	9	1.8	75	4000	810	9	1.2
8	150	6000	2500	12	2.4	120	4800	1300	12	2.4	100	4000	1200	12	2.4	75	3000	840	12	1.6
10	150	4800	2300	15	3	120	3800	1200	15	3	100	3200	1300	15	3	75	2400	770	15	2
12	150	4000	1900	18	3.6	120	3200	1200	18	3.6	100	2700	1200	18	3.6	75	2000	720	18	2.4
16	150	3000	1600	24	4.8	120	2400	960	24	4.8	100	2000	960	24	4.8	75	1500	600	24	3.2
20	150	2400	1300	30	6	120	1900	760	30	6	100	1600	770	30	6	75	1200	480	30	4
25	150	1900	1100	37.5	7.5	120	1500	600	37.5	7.5	100	1300	620	37.5	7.5	75	950	380	37.5	5
Depth of cut																				

General purpose cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
2	120	19000	1300	3	0.6	100	16000	630	3	0.6	80	13000	450	1.5	0.2	70	11000	440	3	0.4
3	120	13000	1400	4.5	0.9	100	11000	700	4.5	0.9	80	8500	450	2.2	0.3	70	7400	470	4.5	0.6
4	120	9500	1400	6	1.2	100	8000	700	6	1.2	80	6400	470	3	0.6	70	5600	490	6	0.8
5	120	7600	1400	7.5	1.5	100	6400	710	7.5	1.5	80	5100	470	4.5	0.9	70	4500	500	7.5	1
6	120	6400	1400	9	1.8	100	5300	710	9	1.8	80	4200	580	6	1.2	70	3700	500	9	1.2
8	120	4800	1300	12	2.4	100	4000	740	12	2.4	80	3200	630	7.5	1.5	70	2800	520	12	1.6
10	120	3800	1200	15	3	100	3200	680	15	3	80	2500	660	9	1.8	70	2200	460	15	2
12	120	3200	1000	18	3.6	100	2700	640	18	3.6	80	2100	610	12	2.4	70	1900	450	18	2.4
16	120	2400	860	24	4.8	100	2000	530	24	4.8	80	1600	510	15	3	70	1400	370	24	3.2
20	120	1900	680	30	6	100	1600	420	30	6	80	1300	410	18	3.6	70	1100	290	30	4
25	120	1500	390	37.5	7.5	100	1300	340	37.5	7.5	80	1000	210	24	4.8	70	890	230	37.5	5
Depth of cut																				

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

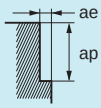
VQMHV

End mill, Medium cut length, 4 flute, Irregular helix flutes

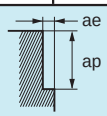
Shoulder milling

When machine rigidity, work material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, work material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Work material	Copper, Copper alloy					Heat resistant alloys Inconel718				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
2	180	29000	2900	3	0.6	40	6400	230	3	0.2
3	180	19000	3000	4.5	0.9	40	4200	240	4.5	0.3
4	180	14000	3000	6	1.2	40	3200	240	6	0.4
5	180	11000	3000	7.5	1.5	40	2500	240	7.5	0.5
6	180	9500	3000	9	1.8	40	2100	250	9	0.6
8	180	7200	3000	12	2.4	40	1600	260	12	0.8
10	180	5700	2700	15	3	40	1300	290	15	1
12	180	4800	2300	18	3.6	40	1100	280	18	1.2
16	180	3600	1900	24	4.8	40	800	200	24	1.6
20	180	2900	1600	30	6	40	640	160	30	2
25	180	2300	1300	37	7.5	40	510	130	37.5	2.5
Depth of cut										

General purpose cutting conditions

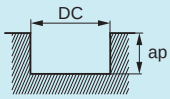
Work material	Copper, Copper alloy					Heat resistant alloys Inconel718				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
2	140	22000	1500	3	0.6	30	4800	110	3	0.2
3	140	15000	1600	4.5	0.9	30	3200	120	4.5	0.3
4	140	11000	1600	6	1.2	30	2400	120	6	0.4
5	140	8900	1600	7.5	1.5	30	1900	120	7.5	0.5
6	140	7400	1600	9	1.8	30	1600	130	9	0.6
8	140	5600	1600	12	2.4	30	1200	130	12	0.8
10	140	4500	1400	15	3	30	950	140	15	1
12	140	3700	1200	18	3.6	30	800	140	18	1.2
16	140	2800	1000	24	4.8	30	600	100	24	1.6
20	140	2200	780	30	6	30	480	81	30	2
25	140	1800	670	37.5	7.5	30	380	64	37.5	2.5
Depth of cut										

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

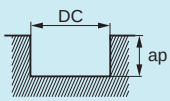
Slotting

When machine rigidity, work material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, work material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				Copper, Copper alloy				Heat resistant alloys Inconel718			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
2	150	24000	1200	2	120	19000	610	2	100	16000	640	2	60	9500	300	1	180	29000	1500	2	30	4800	130	0.6
3	150	16000	1500	3	120	13000	730	3	100	11000	660	3	60	6400	360	1.5	180	19000	1700	3	30	3200	150	0.9
4	150	12000	1900	4	120	9500	910	4	100	8000	700	4	60	4800	460	2	180	14000	2200	4	30	2400	170	1.2
5	150	9500	1900	5	120	7600	910	5	100	6400	720	5	60	3800	460	2.5	180	11000	2200	5	30	1900	170	1.5
6	150	8000	1900	6	120	6400	1000	6	100	5300	740	6	60	3200	510	3	180	9500	2300	6	30	1600	180	1.8
8	150	6000	1700	8	120	4800	960	8	100	4000	800	8	60	2400	480	4	180	7200	2000	8	30	1200	190	2.4
10	150	4800	1500	10	120	3800	840	10	100	3200	900	10	60	1900	420	5	180	5700	1800	10	30	950	210	3
12	150	4000	1300	12	120	3200	770	12	100	2700	860	12	60	1600	380	6	180	4800	1500	12	30	800	200	3.6
16	150	3000	1100	12	120	2400	670	12	100	2000	640	12	60	1200	340	8	180	3600	1300	12	30	600	150	4.8
20	150	2400	860	12	120	1900	530	12	100	1600	510	12	60	950	270	10	180	2900	1000	12	30	480	120	6
25	150	1900	760	12	120	1500	420	12	100	1300	420	12	60	760	210	12	180	2300	920	12	30	380	100	7.5
Depth of cut																								

General purpose cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				Copper, Copper alloy				Heat resistant alloys Inconel718			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
2	100	16000	550	2	80	13000	270	2	60	9500	250	2	50	8000	170	1	120	19000	650	2	25	4000	74	0.6
3	100	11000	670	3	80	8500	310	3	60	6400	250	3	50	5300	200	1.5	120	13000	790	3	25	2700	86	0.9
4	100	8000	840	4	80	6400	410	4	60	4800	280	4	50	4000	250	2	120	9500	1000	4	25	2000	93	1.2
5	100	6400	840	5	80	5100	410	5	60	3800	280	5	50	3200	250	2.5	120	7600	1000	5	25	1600	95	1.5
6	100	5300	840	6	80	4200	440	6	60	3200	300	6	50	2700	290	3	120	6400	1000	6	25	1300	96	1.8
8	100	4000	740	8	80	3200	420	8	60	2400	320	8	50	2000	260	4	120	4800	890	8	25	990	100	2.4
10	100	3200	680	10	80	2500	360	10	60	1900	350	10	50	1600	230	5	120	3800	800	10	25	800	120	3
12	100	2700	570	12	80	2100	330	12	60	1600	340	12	50	1300	210	6	120	3200	680	12	25	660	110	3.6
16	100	2000	480	12	80	1600	300	12	60	1200	250	12	50	990	180	8	120	2400	570	12	25	500	84	4.8
20	100	1600	380	12	80	1300	240	12	60	950	200	12	50	800	150	10	120	1900	450	12	25	400	68	6
25	100	1300	340	12	80	1000	180	12	60	760	160	12	50	640	120	12	120	1500	400	12	25	320	50	7.5
Depth of cut																								

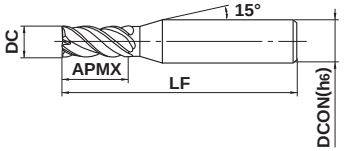
1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work.
   When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient.
   In these cases the feed and speed should be reduced proportionately.
4) When the depth of cut is smaller than shown the feed rate can be increased.

VQMHV – Inch sizes

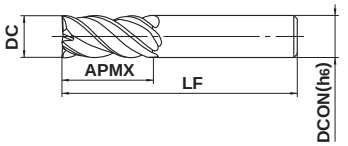
End mill, Medium cut length, 4 flute, Irregular helix flutes

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





Type1



Type2

DC<.5000"	DC=.5000"			
0 - .0008"	0 - .0012"			
.2500"≤DCON≤.3750"	DCON=.5000"			
0 - .00035"	0 - .00043"			

h6

● SMART MIRACLE irregular helix end mills for reducing vibration and for delivering stable performance on difficult-to-cut materials and long overhang applications.

Unit : inch

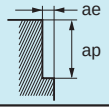
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVD1/8	.1250	.3130	2.0	.2500	4	●	1
VQMHV**D3/16**	.1875	.4375	2.0	.2500	4	●	1
VQMHV**D1/4**	.2500	.6250	2.5	.2500	4	●	2
VQMHV**D5/16**	.3125	.7500	2.75	.3125	4	●	2
VQMHV**D3/8**	.3750	.8750	3.0	.3750	4	●	2
VQMHV**D1/2**	.5000	1.1250	3.5	.5000	4	●	2

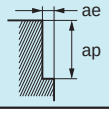
Note) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

● : Inventory maintained.

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283						Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21						Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.					
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)			Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)			Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		
1/8	15000	102.0	12000	55.1	.19	.038	12000	49.1	10000	27.2	.19	.038	10000	34.6	8000	18.1	.19	.038
3/16	10000	99.2	8000	51.2	.28	.056	8000	50.4	6700	28.0	.28	.056	6700	35.3	5300	18.5	.28	.056
1/4	7500	99.2	6000	51.2	.38	.075	6000	52.0	5000	28.7	.38	.075	5000	47.2	4000	24.8	.38	.075
5/16	6000	99.2	4800	51.2	.47	.094	4800	52.9	4000	29.1	.47	.094	4000	47.2	3200	24.8	.47	.094
3/8	5000	90.6	4000	47.2	.56	.11	4000	49.1	3300	26.8	.56	.11	3300	49.4	2700	26.8	.56	.11
1/2	3800	74.8	3000	39.0	.75	.15	3000	43.5	2500	24.0	.75	.15	2500	43.3	2000	22.8	.75	.15
Depth of cut																		

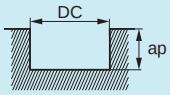
Work material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.						Copper, Copper alloy						Heat resistant alloy Inconel718 etc.					
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)			Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)			Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		
1/8	7500	30.7	7000	18.9	.19	.025	18000	122.0	14000	63.0	.19	.038	4000	9.5	3000	4.7	.19	.013
3/16	5000	31.5	4700	19.7	.28	.038	12000	119.0	9400	63.0	.28	.056	2700	9.8	2000	4.7	.28	.019
1/4	3800	32.9	3500	20.1	.38	.050	9000	119.0	7000	63.0	.38	.075	2000	10.1	1500	5.1	.38	.025
5/16	3000	33.1	2800	20.5	.47	.063	7200	119.0	5600	63.0	.47	.094	1600	10.1	1200	5.1	.47	.031
3/8	2500	30.7	2300	18.5	.56	.075	6000	109.0	4700	55.1	.56	.11	1300	10.6	1000	5.5	.56	.038
1/2	1900	27.5	1800	17.3	.75	.10	4500	88.6	3500	47.2	.75	.15	1000	10.1	750	5.1	.75	.050
Depth of cut																		

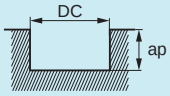
1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloy and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
3) Higher feeds and speeds can be used for smaller depth of cut.
4) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

VQMHV – Inch sizes

End mill, Medium cut length, 4 flute, Irregular helix flutes

Slotting

Work material	Carbon steel (—30HRC) AISI 1035, AISI 1050, ASTM 283					Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21					Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)	
1/8	15000	59.1	10000	26.0	.13	12000	30.2	8000	13.4	.13	10000	26.8	6000	10.6	.13
3/16	10000	75.6	6700	33.5	.19	8000	35.9	5300	15.7	.19	6700	28.5	4000	11.4	.19
1/4	7500	74.4	5000	32.7	.25	6000	39.7	4000	17.3	.25	5000	29.1	3000	11.4	.25
5/16	6000	66.1	4000	29.1	.31	4800	37.8	3200	16.5	.31	4000	31.5	2400	12.6	.31
3/8	5000	61.4	3300	26.8	.38	4000	34.0	2700	15.0	.38	3300	33.8	2000	13.4	.38
1/2	3800	47.9	2500	20.9	.50	3000	29.8	2000	13.0	.50	2500	31.5	1500	12.6	.50
Depth of cut															

Work material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.					Copper, Copper alloy					Heat resistant alloy Inconel718 etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)	
1/8	6000	15.1	5000	8.3	.063	18000	70.9	12000	31.1	.13	3000	6.14	2500	3.4	.038
3/16	4000	18.3	3300	9.8	.094	12000	90.7	8000	39.4	.19	2000	6.80	1700	3.8	.056
1/4	3000	19.8	2500	11.0	.13	9000	89.3	6000	39.4	.25	1500	7.09	1300	3.9	.075
5/16	2400	18.9	2000	10.2	.16	7200	79.4	4800	35.0	.31	1200	7.56	1000	4.3	.094
3/8	2000	17.0	1700	9.4	.19	6000	73.7	4000	32.3	.38	1000	8.19	840	4.7	.11
1/2	1500	14.9	1300	8.7	.25	4500	56.7	3000	24.8	.50	750	7.56	630	4.3	.15
Depth of cut															

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
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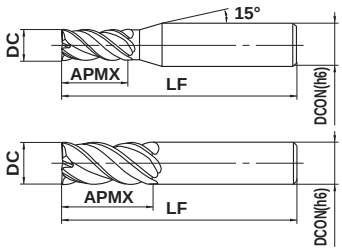
VQJHV NEW

End mill, Semi long cut length, 4 flute, Irregular helix flutes

UWC VQ 38° 40° DC≤6 37.5° 40° DC>6

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





h6

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● SMART MIRACLE vibration control end mills for reduced chattering and for delivering stable performance on difficult-to-cut materials and long overhang applications.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQJHVD0200	2	8	60	6	4	●	1
VQJHV**D0250**	2.5	10	60	6	4	●	1
VQJHV**D0300**	3	12	60	6	4	●	1
VQJHV**D0350**	3.5	14	60	6	4	●	1
VQJHV**D0400**	4	16	60	6	4	●	1
VQJHV**D0450**	4.5	18	60	6	4	●	1
VQJHV**D0500**	5	20	60	6	4	●	1
VQJHV**D0600**	6	24	60	6	4	●	2
VQJHV**D0700**	7	25	80	8	4	●	1
VQJHV**D0800**	8	28	80	8	4	●	2
VQJHV**D0900**	9	32	90	10	4	●	1
VQJHV**D1000**	10	35	90	10	4	●	2
VQJHV**D1200**	12	40	100	12	4	●	2
VQJHV**D1600**	16	55	125	16	4	★	2
VQJHV**D2000**	20	70	140	20	4	★	2

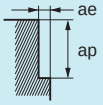
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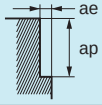
VQJHV NEW

End mill, Semi long cut length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
2	130	21000	700	5	0.2	100	16000	510	5	0.2	80	13000	390	5	0.1	75	12000	360	5	0.1
3	130	14000	960	7.5	0.3	100	11000	680	7.5	0.3	80	8500	490	7.5	0.15	75	8000	460	7.5	0.15
4	130	10000	1000	10	0.4	100	8000	690	10	0.4	80	6400	540	10	0.2	75	6000	510	10	0.2
5	130	8300	1100	12.5	0.5	100	6400	730	12.5	0.5	80	5100	570	12.5	0.25	75	4800	540	12.5	0.25
6	130	6900	1200	15	0.6	100	5300	810	15	0.6	80	4200	630	15	0.3	75	4000	600	15	0.3
8	130	5200	1200	20	0.8	100	4000	840	20	0.8	80	3200	640	20	0.4	75	3000	600	20	0.4
10	130	4100	1100	25	1	100	3200	810	25	1	80	2500	590	25	0.5	75	2400	570	25	0.5
12	130	3400	1100	30	1.2	100	2700	780	30	1.2	80	2100	550	30	0.6	75	2000	520	30	0.6
16	130	2600	920	40	1.6	100	2000	640	40	1.6	80	1600	450	40	0.8	75	1500	420	40	0.8
20	130	2100	820	50	2	100	1600	570	50	2	80	1300	420	50	1	75	1200	390	50	1
Depth of cut																				

Work material	Copper, Copper alloy					Heat resistant alloys Inconel718				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
2	160	25000	830	5	0.2	40	6400	90	5	0.04
3	160	17000	1200	7.5	0.3	40	4200	130	7.5	0.06
4	160	13000	1300	10	0.4	40	3200	190	10	0.08
5	160	10000	1300	12.5	0.5	40	2500	180	12.5	0.1
6	160	8500	1500	15	0.6	40	2100	180	15	0.12
8	160	6400	1500	20	0.8	40	1600	170	20	0.16
10	160	5100	1300	25	1	40	1300	170	25	0.2
12	160	4200	1300	30	1.2	40	1100	140	30	0.24
16	160	3200	1100	40	1.6	40	800	110	40	0.32
20	160	2500	970	50	2	40	640	80	50	0.4
Depth of cut										

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2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

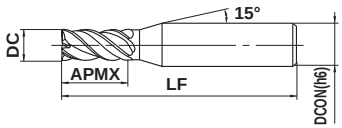
VQJHV – Inch sizes NEW

End mill, Semi long cut length, 4 flute, Irregular helix flutes

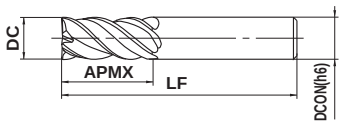
UWC VQ 38° 40° DC≤1/4 37.5° 40° DC>1/4

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





Type1



Type2

h6

DC<.5000"	DC=.5000"			
0 - .0008"	0 - .0012"			
.2500"≤DCON≤.3750"	DCON=.5000"			
0 - .00035"	0 - .00043"			

● SMART MIRACLE vibration control end mills for reduced chattering and for delivering stable performance on difficult-to-cut materials and long overhang applications.

Unit : inch

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQJHVD1/8	.1250	.5000	2.5	.2500	4	●	1
VQJHV**D3/16**	.1875	.7500	2.5	.2500	4	●	1
VQJHV**D1/4**	.2500	1.0000	2.5	.2500	4	●	2
VQJHV**D5/16**	.3125	1.0900	3.25	.3125	4	●	2
VQJHV**D3/8**	.3750	1.3100	3.5	.3750	4	●	2
VQJHV**D1/2**	.5000	1.6500	4.0	.5000	4	●	2

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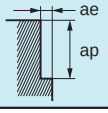
● : Inventory maintained.

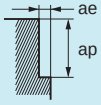
VQJHV – Inch sizes NEW

End mill, Semi long cut length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Carbon steel, Alloy steel, Mild steel AISI 1035, AISI 1050, ASTM 283				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI H13, AISI 4140, AISI P21				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				Hardened stainless steels, Cobaly chromium alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.			
DC (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
1/8	13000	39	.313	.013	10000	26.8	.313	.013	8000	2.1	.313	.006	7500	18.9	.313	.006
3/16	8700	39.4	.469	.019	6700	27.6	.469	.019	5300	21.7	.469	.009	5000	20.5	.469	.009
1/4	6500	47.2	.625	.025	5000	32.3	.625	.025	4000	25.2	.625	.013	3800	24	.625	.013
5/16	5200	47.2	.781	.031	4000	33.5	.781	.031	3200	25.2	.781	.016	3000	23.6	.781	.016
3/8	4300	43.3	.938	.038	3300	31.9	.938	.038	2700	23.2	.938	.019	2500	22.4	.938	.019
1/2	3300	43.3	1.25	.05	2500	29.1	1.25	.05	2000	2.9	1.25	.025	1900	20.1	1.25	.025
Depth of cut																

Work material	Copper, Copper alloy				Heat resistant alloys Inconel718 etc.			
DC (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
1/8	16000	48	.013	.013	4000	5.1	.313	.003
3/16	11000	51.9	.019	.019	2700	7.1	.469	.004
1/4	8000	57.9	.025	.025	2000	6.7	.625	.005
5/16	6400	59.4	.031	.031	1600	6.7	.781	.006
3/8	5300	51.7	.038	.038	1300	6.7	.938	.008
1/2	4000	50.4	.05	.05	1000	5.1	1.25	.01
Depth of cut								

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2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

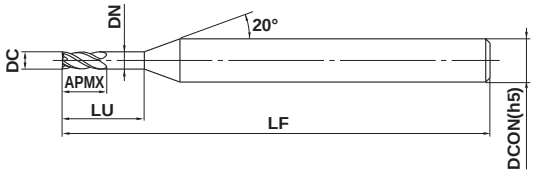
VQXL NEW

End mill, Short cut length, 4 flute, Long neck

UWC VQ 35° DC≤0.3 DC≥0.4

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





Type1

h5					
DC≤1					
0 - 0.010					
DCON=4					
0 - 0.005					

- SMART MIRACLE coating enhances efficiency due to an improved chip disposal.
- Providing a high efficiency and a long tool life by increasing the number of flutes.

Unit : mm

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VQXLD0020N006	0.2	0.3	0.6	0.18	40	4	3	●	1
VQXL**D0030N009**	0.3	0.5	0.9	0.28	40	4	3	●	1
VQXL**D0030N015**	0.3	0.5	1.5	0.28	40	4	3	●	1
VQXL**D0040N010**	0.4	0.6	1	0.37	40	4	4	●	1
VQXL**D0040N018**	0.4	0.6	1.8	0.37	40	4	4	●	1
VQXL**D0050N015**	0.5	0.7	1.5	0.46	40	4	4	●	1
VQXL**D0050N025**	0.5	0.7	2.5	0.46	40	4	4	●	1
VQXL**D0050N030**	0.5	0.7	3	0.46	40	4	4	●	1
VQXL**D0060N030**	0.6	0.9	3	0.57	40	4	4	●	1
VQXL**D0070N035**	0.7	1	3.5	0.67	40	4	4	●	1
VQXL**D0080N024**	0.8	1.2	2.4	0.77	40	4	4	●	1
VQXL**D0080N030**	0.8	1.2	3	0.77	40	4	4	●	1
VQXL**D0080N040**	0.8	1.2	4	0.77	40	4	4	●	1
VQXL**D0100N050**	1	1.5	5	0.96	40	4	4	●	1

Note) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

TORX Chart

Order Number	ISO 10664 TORX Type
VQXLD0020N006	T4
VQXL**D0030N009**	T6
VQXL**D0030N015**	
VQXL**D0040N010**	T8
VQXL**D0040N018**	
VQXL**D0050N015**	T15
VQXL**D0050N025**	
VQXL**D0050N030**	
VQXL**D0080N024**	T25
VQXL**D0080N040**	
VQXL**D0100N050**	T40

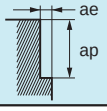
● : Inventory maintained.

VQXL NEW

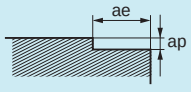
End mill, Short cut length, 4 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

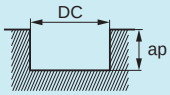
Work material		Carbon steel, Alloy steel, Mild steel, Alloy tool steel, Austenitic stainless steels, Titanium alloys Cobaly chromium alloy, Copper, Copper alloy S45C, SCM440, SNCM439, SUS304, SUS316, SUS304LN, SUS316LN, Ti-6Al-4V					Heat resistant alloys, Pre-hardened steel, Hardened steel Inconel718, NAK, PX5, SKD61, SKT4, SUS431, SUS420J2				
DC (mm)	**LU** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.2	0.6	25	40000	360	0.03	0.01	20	32000	290	0.03	0.01
0.3	0.9	40	40000	480	0.045	0.015	20	21000	250	0.045	0.015
0.3	1.5	40	40000	360	0.045	0.015	20	21000	190	0.045	0.015
0.4	1.2	50	40000	800	0.06	0.02	20	16000	320	0.06	0.02
0.4	2	50	40000	560	0.06	0.02	20	16000	220	0.06	0.025
0.5	1.5	60	38000	910	0.075	0.025	20	13000	310	0.075	0.025
0.5	2.5	60	38000	610	0.075	0.025	20	13000	210	0.075	0.025
0.5	3	60	38000	550	0.075	0.025	20	13000	180	0.075	0.025
0.6	3	60	32000	640	0.09	0.03	20	10500	210	0.09	0.03
0.7	3.5	60	27000	650	0.11	0.035	20	9100	200	0.11	0.035
0.8	2.4	60	24000	960	0.12	0.04	20	8000	260	0.12	0.04
0.8	3	60	24000	860	0.12	0.04	20	8000	230	0.12	0.04
0.8	4	60	24000	670	0.12	0.04	20	8000	190	0.12	0.04
1	5	60	20000	800	0.15	0.05	20	6500	210	0.15	0.05
Depth of cut											

Face milling

Work material		Carbon steel, Alloy steel, Mild steel, Alloy tool steel, Austenitic stainless steels, Titanium alloys Cobaly chromium alloy, Copper, Copper alloy S45C, SCM440, SNCM439, SUS304, SUS316, SUS304LN, SUS316LN, Ti-6Al-4V					Heat resistant alloys, Pre-hardened steel, Hardened steel Inconel718, NAK, PX5, SKD61, SKT4, SUS431, SUS420J2				
DC (mm)	**LU** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.2	0.6	25	40000	360	0.015	≤0.2	20	32000	290	0.015	≤0.1
0.3	0.9	40	40000	480	0.025	≤0.3	20	21000	250	0.025	≤0.15
0.3	1.5	40	40000	360	0.02	≤0.3	20	21000	190	0.02	≤0.15
0.4	1.2	50	40000	800	0.03	≤0.4	20	16000	320	0.03	≤0.2
0.4	2	50	40000	560	0.02	≤0.4	20	16000	220	0.02	≤0.2
0.5	1.5	60	38000	910	0.04	≤0.5	20	13000	310	0.04	≤0.25
0.5	2.5	60	38000	610	0.03	≤0.5	20	13000	210	0.03	≤0.25
0.5	3	60	38000	550	0.03	≤0.5	20	13000	180	0.03	≤0.25
0.6	3	60	32000	640	0.035	≤0.6	20	10500	210	0.035	≤0.3
0.7	3.5	60	27000	640	0.035	≤0.7	20	9100	190	0.035	≤0.35
0.8	2.4	60	24000	960	0.06	≤0.8	20	8000	260	0.06	≤0.4
0.8	3	60	24000	840	0.05	≤0.8	20	8000	230	0.05	≤0.4
0.8	4	60	24000	670	0.04	≤0.8	20	8000	190	0.04	≤0.4
1	5	60	20000	800	0.05	≤1	20	6500	210	0.05	≤0.5
Depth of cut											

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

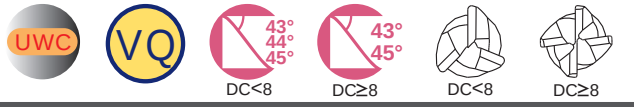
Slotting

Work material		Carbon steel, Alloy steel, Mild steel, Alloy tool steel, Austenitic stainless steels, Titanium alloys Cobaly chromium alloy, Copper, Copper alloy S45C, SCM440, SNCM439, SUS304, SUS316, SUS304LN, SUS316LN, Ti-6Al-4V				Heat resistant alloys, Pre-hardened steel, Hardened steel Inconel718, NAK, PX5, SKD61, SKT4, SUS431, SUS420J2			
DC (mm)	**LU** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
0.2	0.6	20	30000	270	0.03	15	24000	220	0.03
0.3	0.9	30	30000	360	0.045	14	15000	180	0.045
0.3	1.5	30	30000	270	0.045	14	15000	140	0.045
0.4	1.2	40	30000	600	0.06	15	12000	240	0.06
0.4	2	40	30000	420	0.06	15	12000	170	0.06
0.5	1.5	45	28000	670	0.075	15	9500	230	0.075
0.5	2.5	45	28000	450	0.075	15	9500	150	0.075
0.5	3	45	28000	390	0.075	15	9500	130	0.075
0.6	3	45	24000	480	0.09	15	7800	160	0.09
0.7	3.5	45	20000	480	0.11	15	6800	140	0.11
0.8	2.4	45	18000	720	0.12	15	6000	190	0.12
0.8	3	45	18000	650	0.12	15	6000	170	0.12
0.8	4	45	18000	500	0.12	15	6000	140	0.12
1	5	45	15000	600	0.15	15	4800	150	0.15
Depth of cut									

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) When the depth of cut is smaller than shown the feed rate can be increased.

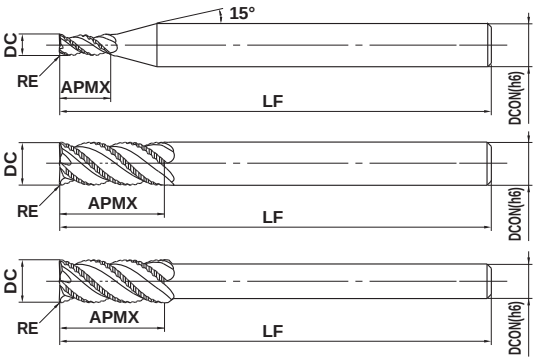
VQSVR NEW

Roughing end mill, Short cut length, 4 flute, Irregular helix flutes



Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





h6	DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20
	0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013

- Achieving excellent vibration resistance due to the adoption of irregular helix.
- Offering greater fracture resistance than conventional roughing by adopting an asymmetrical nick.

Unit : mm

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQSVRD0300	3	0.2	6	60	6	3	●	1
VQSVR**D0400**	4	0.2	8	60	6	3	●	1
VQSVR**D0500**	5	0.3	10	60	6	3	●	1
VQSVR**D0600**	6	0.3	12	70	6	3	●	2
VQSVR**D0700**	7	0.3	17	80	8	3	●	1
VQSVR**D0800**	8	0.5	17	80	8	4	●	2
VQSVR**D0900**	9	0.5	22	90	10	4	●	1
VQSVR**D1000S08**	10	0.5	22	90	8	4	●	3
VQSVR**D1000**	10	0.5	22	90	10	4	●	2
VQSVR**D1200S10**	12	0.5	27	100	10	4	●	3
VQSVR**D1200**	12	0.5	27	100	12	4	●	2
VQSVR**D1400**	14	0.5	27	130	12	4	★	3
VQSVR**D1600**	16	0.5	33	125	16	4	★	2
VQSVR**D1800**	18	0.5	33	150	16	4	★	3
VQSVR**D2000**	20	0.5	38	140	20	4	★	2

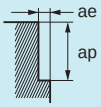
Note) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

● : Inventory maintained. ★ : Inventory maintained in Japan.

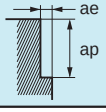
Shoulder milling

When machine rigidity, work material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, work material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631					Copper, Copper alloy				
DC (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)
3	150	16000	960	4.5	1.5	120	13000	640	4.5	1.5	100	11000	450	4.5	1.5	75	8000	330	4.5	0.9	180	19000	1100	4.5	1.5
4	150	12000	960	6	2	120	9500	640	6	2	100	8000	430	6	2	75	6000	330	6	1.2	180	14000	1100	6	2
5	150	9500	960	7.5	2.5	120	7600	640	7.5	2.5	100	6400	440	7.5	2.5	75	4800	330	7.5	1.5	180	11000	1100	7.5	2.5
6	150	8000	960	9	3	120	6400	680	9	3	100	5300	480	9	3	75	4000	360	9	1.8	180	9500	1100	9	3
7	150	6800	950	10.5	3.5	120	5500	700	10.5	3.5	100	4500	500	10.5	3.5	75	3400	380	10.5	2.1	180	8200	1100	10.5	3.5
8	150	6000	1100	12	4	120	4800	800	12	4	100	4000	570	12	4	75	3000	430	12	2.4	180	7200	1300	12	4
9	150	5300	1100	13.5	4.5	120	4200	760	13.5	4.5	100	3500	570	13.5	4.5	75	2700	430	13.5	2.7	180	6400	1300	13.5	4.5
10	150	4800	1100	15	5	120	3800	760	15	5	100	3200	570	15	5	75	2400	430	15	3	180	5700	1200	15	5
12	150	4000	960	18	6	120	3200	700	18	6	100	2700	540	18	6	75	2000	400	18	3.6	180	4800	1200	18	6
14	150	3400	880	21	7	120	2700	650	21	7	100	2300	510	21	7	75	1700	380	21	4.2	180	4100	1100	21	7
16	150	3000	840	24	8	120	2400	620	24	8	100	2000	500	24	8	75	1500	380	24	4.8	180	3600	1000	24	8
18	150	2700	810	27	9	120	2100	590	27	9	100	1800	500	27	9	75	1300	360	27	5.4	180	3200	960	27	9
20	150	2400	760	30	10	120	1900	560	30	10	100	1600	500	30	10	75	1200	360	30	6	180	2900	920	30	10
Depth of cut																									

General purpose cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631					Copper, Copper alloy				
DC (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)
3	120	13000	610	4.5	1.5	100	11000	430	4.5	1.5	80	8500	280	4.5	1.5	70	7400	240	4.5	0.9	140	15000	700	4.5	1.5
4	120	9500	610	6	2	100	8000	430	6	2	80	6400	280	6	2	70	5600	240	6	1.2	140	11000	700	6	2
5	120	7600	610	7.5	2.5	100	6400	430	7.5	2.5	80	5100	280	7.5	2.5	70	4500	250	7.5	1.5	140	8900	720	7.5	2.5
6	120	6400	610	9	3	100	5300	450	9	3	80	4200	300	9	3	70	3700	270	9	1.8	140	7400	720	9	3
7	120	5500	620	10.5	3.5	100	4500	480	10.5	3.5	80	3600	320	10.5	3.5	70	3200	290	10.5	2.1	140	6400	720	10.5	3.5
8	120	4800	720	12	4	100	4000	570	12	4	80	3200	380	12	4	70	2800	340	12	2.4	140	5600	840	12	4
9	120	4200	670	13.5	4.5	100	3500	510	13.5	4.5	80	2800	360	13.5	4.5	70	2500	320	13.5	2.7	140	5000	800	13.5	4.5
10	120	3800	670	15	5	100	3200	510	15	5	80	2500	360	15	5	70	2200	310	15	3	140	4500	790	15	5
12	120	3200	610	18	6	100	2700	470	18	6	80	2100	340	18	6	70	1900	300	18	3.6	140	3700	710	18	6
14	120	2700	560	21	7	100	2300	440	21	7	80	1800	320	21	7	70	1600	280	21	4.2	140	3200	670	21	7
16	120	2400	540	24	8	100	2000	410	24	8	80	1600	320	24	8	70	1400	280	24	4.8	140	2800	630	24	8
18	120	2100	500	27	9	100	1800	400	27	9	80	1400	310	27	9	70	1200	270	27	5.4	140	2500	600	27	9
20	120	1900	480	30	10	100	1600	380	30	10	80	1300	310	30	10	70	1100	270	30	6	140	2200	560	30	10
Depth of cut																									

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work.
   When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient.
   In these cases the feed and speed should be reduced proportionately.
4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

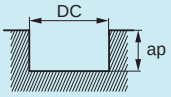
VQSVR NEW

Roughing end mill, Short cut length, 4 flute, Irregular helix flutes

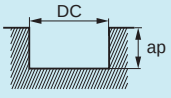
Slotting

When machine rigidity, work material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, work material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				Copper, Copper alloy			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
3	120	13000	720	3	100	11000	440	3	80	8500	340	3	60	6400	250	1.5	150	16000	890	3
4	120	9500	720	4	100	8000	450	4	80	6400	340	4	60	4800	250	2	150	12000	900	4
5	120	7600	720	5	100	6400	460	5	80	5100	300	5	60	3800	230	2.5	150	9500	900	5
6	120	6400	720	6	100	5300	460	6	80	4200	310	6	60	3200	240	3	150	8000	900	6
7	120	5500	730	7	100	4500	470	7	80	3600	330	7	60	2700	250	3.5	150	6800	950	7
8	120	4800	840	8	100	4000	560	8	80	3200	400	8	60	2400	300	4	150	6000	1100	8
9	120	4200	810	9	100	3500	540	9	80	2800	350	9	60	2100	260	4.5	150	5300	1000	9
10	120	3800	800	10	100	3200	520	10	80	2500	340	10	60	1900	260	5	150	4800	1000	10
12	120	3200	750	12	100	2700	480	12	80	2100	340	12	60	1600	260	6	150	4000	940	12
14	120	2700	670	14	100	2300	420	14	80	1800	300	14	60	1400	240	7	150	3400	840	14
16	120	2400	620	16	100	2000	380	16	80	1600	290	16	60	1200	220	8	150	3000	780	16
18	120	2100	570	18	100	1800	380	18	80	1400	260	18	60	1100	210	9	150	2700	730	18
20	120	1900	540	20	100	1600	350	20	80	1300	260	20	60	950	190	10	150	2400	680	20
Depth of cut																				

General purpose cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				Copper, Copper alloy			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
3	100	11000	490	3	80	8500	300	3	60	6400	200	3	50	5300	170	1.5	120	13000	580	3
4	100	8000	490	4	80	6400	310	4	60	4800	200	4	50	4000	170	2	120	9500	580	4
5	100	6400	490	5	80	5100	310	5	60	3800	200	5	50	3200	170	2.5	120	7600	580	5
6	100	5300	490	6	80	4200	310	6	60	3200	200	6	50	2700	170	3	120	6400	580	6
7	100	4500	500	7	80	3600	320	7	60	2700	200	7	50	2300	170	3.5	120	5500	620	7
8	100	4000	600	8	80	3200	380	8	60	2400	240	8	50	2000	200	4	120	4800	720	8
9	100	3500	540	9	80	2800	330	9	60	2100	210	9	50	1800	180	4.5	120	4200	650	9
10	100	3200	540	10	80	2500	330	10	60	1900	210	10	50	1600	180	5	120	3800	640	10
12	100	2700	510	12	80	2100	320	12	60	1600	210	12	50	1300	170	6	120	3200	600	12
14	100	2300	460	14	80	1800	300	14	60	1400	190	14	50	1100	150	7	120	2700	540	14
16	100	2000	410	16	80	1600	290	16	60	1200	170	16	50	990	140	8	120	2400	500	16
18	100	1800	390	18	80	1400	260	18	60	1100	170	18	50	880	130	9	120	2100	460	18
20	100	1600	360	20	80	1300	260	20	60	950	150	20	50	800	130	10	120	1900	430	20
Depth of cut																				

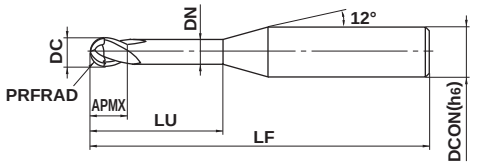
1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
4) When the depth of cut is smaller than shown the feed rate can be increased.

VQ4SVB

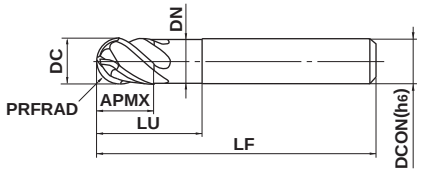
Ball nose, Short cut length, 4 flute, Variable curve

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎	○	





Type1



Type2

R				
1≤PRFRAD≤6				
±0.01				
DC≤12				
0 - 0.02				
h6	DCON=6	8≤DCON≤10	DCON=12	
	0 - 0.008	0 - 0.009	0 - 0.011	

● SMART MIRACLE irregular helix ball nose end mills for reducing vibration and for delivering stable performance on difficult-to-cut materials such as inconel.

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VQ4SVBR0100	1	2	3	5	1.9	50	6	4	●	1
VQ4SVB**R0150**	1.5	3	4.5	7.5	2.9	50	6	4	●	1
VQ4SVB**R0200**	2	4	6	10	3.9	50	6	4	●	1
VQ4SVB**R0250**	2.5	5	7.5	12.5	4.9	50	6	4	●	1
VQ4SVB**R0300**	3	6	9	15	5.85	50	6	4	●	2
VQ4SVB**R0400**	4	8	12	20	7.85	60	8	4	●	2
VQ4SVB**R0500**	5	10	15	25	9.7	70	10	4	●	2
VQ4SVB**R0600**	6	12	18	30	11.7	75	12	4	●	2

Note) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

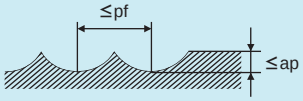
● : Inventory maintained.

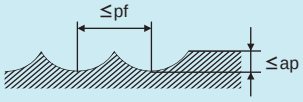
VQ4SVB

Ball nose, Short cut length, 4 flute, Variable curve

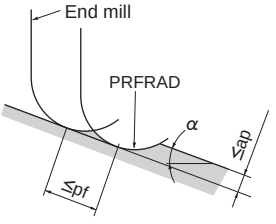
RECOMMENDED CUTTING CONDITIONS

Shoulder milling (grooving)

Work material	Carbon steel, Alloy steel, Mild steel, Pre-hardened steel S45C, SCM440, SS400, S10C, NAK, PX5, SNCM439								Austenitic stainless steel, Titanium alloy, Hardened stainless steels, Cobaly chromium alloy, Ferritic and Martensitic stainless steels SUS304, SUS316, Ti-6Al-4V, SUS630, SUS631, SUS431, SUS420J2							
PRFRAD (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Pick feed pf (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Pick feed pf (mm)
	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)			Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)		
R 1	250	40000	8000	200	32000	3800	0.17	0.5	230	36000	6500	150	24000	2900	0.17	0.5
R 1.5	300	32000	7700	200	21000	3200	0.25	0.75	230	24000	4800	150	16000	1900	0.25	0.75
R 2	300	24000	5800	200	16000	2800	0.33	1	230	18000	4000	150	12000	1700	0.33	1
R 2.5	300	19000	5300	200	12700	2600	0.42	1.25	230	14400	3500	150	9600	1500	0.42	1.25
R 3	300	16000	4800	200	10600	2100	0.5	1.5	230	12000	3200	150	8000	1400	0.5	1.5
R 4	300	12000	4300	200	8000	1900	0.8	2	230	9000	3200	150	6000	1400	0.8	2
R 5	300	9600	4100	200	6400	1800	1	2.5	230	7200	3000	150	4800	1300	1	2.5
R 6	300	8000	4000	200	5300	1800	1.2	3	230	6000	3000	150	4000	1300	1.2	3
Depth of cut																

Work material	Copper, Copper alloy								Heat resistant alloys Inconel etc.							
PRFRAD (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Pick feed pf (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Pick feed pf (mm)
	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)			Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)		
R 1	250	40000	8000	240	38000	4500	0.17	0.5	60	9600	960	40	6400	510	0.08	0.2
R 1.5	360	38000	9100	240	25000	3800	0.25	0.7	60	6400	640	40	4200	340	0.13	0.3
R 2	360	29000	7000	240	19000	3300	0.33	1	60	4800	580	40	3200	260	0.17	0.4
R 2.5	360	23000	6400	240	15000	3100	0.42	1.2	60	3800	530	39	2500	250	0.21	0.5
R 3	360	19000	5700	240	13000	2600	0.5	1.5	60	3200	500	40	2100	210	0.25	0.6
R 4	360	14000	5000	240	9600	2300	0.8	2	60	2400	430	40	1600	190	0.4	0.8
R 5	360	12000	5100	240	7700	2200	1	2.5	63	2000	420	41	1300	180	0.5	1
R 6	360	9600	4800	240	6400	2200	1.2	3	64	1700	350	41	1100	150	0.6	1.2
Depth of cut																

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.
5) α is the inclination angle of the machined surface.



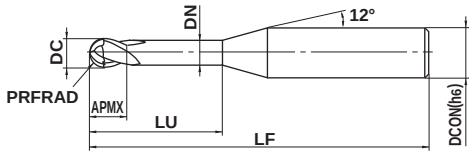
VQ4SVB – Inch sizes NEW

Ball nose, Short cut length, 4 flute, Variable curve

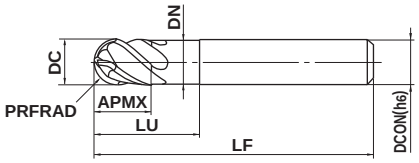
UWC VQ 45°

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎	○	





Type 1



Type 2

R						
	±.0004"					
	DC<.5000"	DC=.5000"				
	0 - .0008"	0 - .0012"				
h6	.250"≤DCON≤.375"	DCON=.500"				
	0 - .00035"	0 - .00043"				

● SMART MIRACLE irregular helix ball nose end mills for reducing vibration and for delivering stable performance on difficult-to-cut materials such as inconel.

Unit : inch

Order Number	PRFRAD	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VQ4SVBD1/8	.0625	.1250	.188	.3126	.1213	2.0	.2500	4	●	1
VQ4SVB**D3/16**	.0938	.1875	.281	.4689	.1835	2.0	.2500	4	●	1
VQ4SVB**D1/4**	.1250	.2500	.375	.6252	.2441	2.0	.2500	4	●	2
VQ4SVB**D5/16**	.1563	.3125	.469	.7811	.3067	2.5	.3126	4	●	2
VQ4SVB**D3/8**	.1875	.3750	.563	.9374	.3693	2.75	.3752	4	●	2
VQ4SVB**D1/2**	.2500	.5000	.750	1.2500	.4882	3.0	.5000	4	●	2

Note) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

● : Inventory maintained.

VQ4SVB – Inch sizes NEW

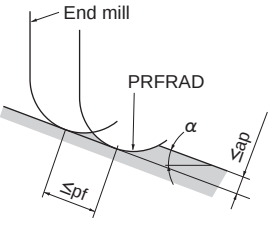
Ball nose, Short cut length, 4 flute, Variable curve

Shoulder milling (Slotting)

Work material	Carbon steel, Alloy steel, Mild Steel, Pre-hardened steel AISI 1010, AISI 1035, AISI 1050, ASTM 283, AISI H13, AISI 4140, AISI P21						Austenitic steinless steel, Titanium alloy, Hardened stainless steel, Cobaly chomium alloy, Ferritic and Martensitic stainless steels AISI 304, AISI 316, AISI S17400, AISI S17700, AISI 430, AISI 420					
PRFRAD (inch)	α≤15°		α>15°		Depth of cut ap (inch)	Pick feed pf (inch)	α≤15°		α>15°		Depth of cut ap (inch)	Pick feed pf (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)			Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		
.0625	30000	283.5	20000	118.1	.0098	.0313	22500	189.0	15000	74.8	.0098	.0313
.0938	20000	220.5	13400	102.4	.0165	.0469	15000	137.8	10000	59.1	.0165	.0469
.1250	15000	177.2	10000	82.7	.0197	.0626	11200	126.0	7500	55.1	.0197	.0626
.1563	12000	169.3	8000	74.8	.0315	.0781	9000	126.0	6000	55.1	.0315	.0781
.1875	10000	161.4	6700	70.9	.0394	.0937	7500	118.1	5000	51.2	.0394	.0937
.2500	7600	149.6	5000	70.9	.0472	.125	5600	118.1	3800	51.2	.0472	.125
Depth of cut	≤pf, ≤ap											

Work material	Copper, Copper alloys						Heat resistant alloy Inconel718 etc.					
PRFRAD (inch)	α≤15°		α>15°		Depth of cut ap (inch)	Pick feed pf (inch)	α≤15°		α>15°		Depth of cut ap (inch)	Pick feed pf (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)			Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		
.0625	36000	338.6	24000	141.7	.0098	.0313	6000	25.2	4000	13.4	.0051	.0313
.0938	24000	263.8	16000	122.0	.0165	.0469	4000	20.9	2700	9.8	.0083	.0469
.1250	18000	212.6	12000	98.4	.0197	.0626	3000	19.7	2000	8.3	.0098	.0626
.1563	14000	196.9	9600	90.6	.0315	.0781	2400	16.9	1600	7.5	.0157	.0781
.1875	12000	192.9	8000	82.7	.0394	.0937	2000	16.5	1300	7.1	.0197	.0937
.2500	9100	181.1	6000	86.6	.0472	.125	1500	13.8	1000	5.9	.0236	.0125
Depth of cut	≤pf, ≤ap											

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
3) If the depth of cut is smaller than this table, feed rate can be increased.
4) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.
5) α is the inclination of the machined surface.



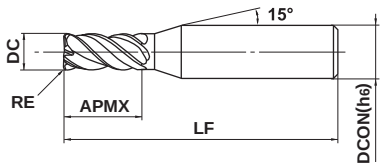
VQMHVRB

Corner radius, End mill, Medium cut length, 4 flute, Irregular helix flutes

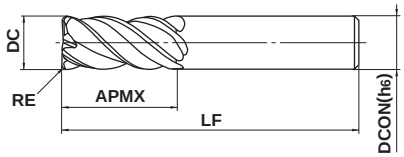
UWC VQ 37° 40°

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			○	◎	○	





Type1



Type2

R

0.2≤RE≤6.35				
±0.015				

DC≤12 DC>12

DC≤12	DC>12			
0 - 0.02	0 - 0.03			

h6

4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

- SMART MIRACLE corner radius, irregular helix end mills for reducing vibration and for delivering stable performance on difficult-to-cut materials and long overhang applications.

Unit : mm

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVRBD0200R020	2	0.2	4	45	4	4	●	1
VQMHVRB**D0200R030**	2	0.3	4	45	4	4	●	1
VQMHVRB**D0300R020**	3	0.2	8	45	6	4	●	1
VQMHVRB**D0300R030**	3	0.3	8	45	6	4	●	1
VQMHVRB**D0300R050**	3	0.5	8	45	6	4	●	1
VQMHVRB**D0400R020**	4	0.2	11	45	6	4	●	1
VQMHVRB**D0400R030**	4	0.3	11	45	6	4	●	1
VQMHVRB**D0400R050**	4	0.5	11	45	6	4	●	1
VQMHVRB**D0500R020**	5	0.2	13	50	6	4	●	1
VQMHVRB**D0500R030**	5	0.3	13	50	6	4	●	1
VQMHVRB**D0500R050**	5	0.5	13	50	6	4	●	1
VQMHVRB**D0500R100**	5	1	13	50	6	4	●	1
VQMHVRB**D0600R030**	6	0.3	13	50	6	4	●	2
VQMHVRB**D0600R050**	6	0.5	13	50	6	4	●	2
VQMHVRB**D0600R100**	6	1	13	50	6	4	●	2
VQMHVRB**D0800R030**	8	0.3	19	60	8	4	●	2
VQMHVRB**D0800R050**	8	0.5	19	60	8	4	●	2
VQMHVRB**D0800R100**	8	1	19	60	8	4	●	2
VQMHVRB**D0800R150**	8	1.5	19	60	8	4	●	2
VQMHVRB**D1000R030**	10	0.3	22	70	10	4	●	2
VQMHVRB**D1000R050**	10	0.5	22	70	10	4	●	2
VQMHVRB**D1000R100**	10	1	22	70	10	4	●	2
VQMHVRB**D1000R150**	10	1.5	22	70	10	4	●	2
VQMHVRB**D1000R200**	10	2	22	70	10	4	●	2
VQMHVRB**D1200R050**	12	0.5	26	75	12	4	●	2
VQMHVRB**D1200R100**	12	1	26	75	12	4	●	2
VQMHVRB**D1200R150**	12	1.5	26	75	12	4	●	2
VQMHVRB**D1200R200**	12	2	26	75	12	4	●	2
VQMHVRB**D1200R250**	12	2.5	26	75	12	4	●	2
VQMHVRB**D1200R300**	12	3	26	75	12	4	●	2

Note) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

● : Inventory maintained.

VQMHVRB

Corner radius, End mill, Medium cut length, 4 flute, Irregular helix flutes

Unit : mm

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVRBD1600R100	16	1	35	90	16	4	★	2
VQMHVRBD1600R150	16	1.5	35	90	16	4	★	2
VQMHVRBD1600R200	16	2	35	90	16	4	★	2
VQMHVRBD1600R250	16	2.5	35	90	16	4	★	2
VQMHVRBD1600R300	16	3	35	90	16	4	★	2
VQMHVRBD1600R400	16	4	35	90	16	4	★	2
VQMHVRBD1600R500	16	5	35	90	16	4	★	2
VQMHVRBD2000R100	20	1	45	110	20	4	★	2
VQMHVRBD2000R150	20	1.5	45	110	20	4	★	2
VQMHVRBD2000R200	20	2	45	110	20	4	★	2
VQMHVRBD2000R250	20	2.5	45	110	20	4	★	2
VQMHVRBD2000R300	20	3	45	110	20	4	★	2
VQMHVRBD2000R400	20	4	45	110	20	4	★	2
VQMHVRBD2000R500	20	5	45	110	20	4	★	2
VQMHVRBD2000R635	20	6.35	45	110	20	4	★	2

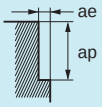
Note) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

★ : Inventory maintained in Japan.

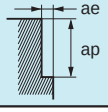
Shoulder milling

When machine rigidity, work material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, work material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
2	150	24000	2400	3	0.6	120	19000	1100	3	0.6	100	16000	830	3	0.6	75	12000	720	3	0.4
3	150	16000	2600	4.5	0.9	120	13000	1200	4.5	0.9	100	11000	880	4.5	0.9	75	8000	770	4.5	0.6
4	150	12000	2600	6	1.2	120	9500	1300	6	1.2	100	8000	900	6	1.2	75	6000	790	6	0.8
5	150	9500	2600	7.5	1.5	120	7600	1300	7.5	1.5	100	6400	900	7.5	1.5	75	4800	810	7.5	1
6	150	8000	2600	9	1.8	120	6400	1300	9	1.8	100	5300	1100	9	1.8	75	4000	810	9	1.2
8	150	6000	2500	12	2.4	120	4800	1300	12	2.4	100	4000	1200	12	2.4	75	3000	840	12	1.6
10	150	4800	2300	15	3	120	3800	1200	15	3	100	3200	1300	15	3	75	2400	770	15	2
12	150	4000	1900	18	3.6	120	3200	1200	18	3.6	100	2700	1200	18	3.6	75	2000	720	18	2.4
16	150	3000	1600	24	4.8	120	2400	960	24	4.8	100	2000	960	24	4.8	75	1500	600	24	3.2
20	150	2400	1300	30	6	120	1900	760	30	6	100	1600	770	30	6	75	1200	480	30	4
25	150	1900	1100	37.5	7.5	120	1500	600	37.5	7.5	100	1300	620	37.5	7.5	75	950	380	37.5	5
Depth of cut																				

General purpose cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
2	120	19000	1300	3	0.6	100	16000	630	3	0.6	80	13000	450	1.5	0.2	70	11000	440	3	0.4
3	120	13000	1400	4.5	0.9	100	11000	700	4.5	0.9	80	8500	450	2.2	0.3	70	7400	470	4.5	0.6
4	120	9500	1400	6	1.2	100	8000	700	6	1.2	80	6400	470	3	0.6	70	5600	490	6	0.8
5	120	7600	1400	7.5	1.5	100	6400	710	7.5	1.5	80	5100	470	4.5	0.9	70	4500	500	7.5	1
6	120	6400	1400	9	1.8	100	5300	710	9	1.8	80	4200	580	6	1.2	70	3700	500	9	1.2
8	120	4800	1300	12	2.4	100	4000	740	12	2.4	80	3200	630	7.5	1.5	70	2800	520	12	1.6
10	120	3800	1200	15	3	100	3200	680	15	3	80	2500	660	9	1.8	70	2200	460	15	2
12	120	3200	1000	18	3.6	100	2700	640	18	3.6	80	2100	610	12	2.4	70	1900	450	18	2.4
16	120	2400	860	24	4.8	100	2000	530	24	4.8	80	1600	510	15	3	70	1400	370	24	3.2
20	120	1900	680	30	6	100	1600	420	30	6	80	1300	410	18	3.6	70	1100	290	30	4
25	120	1500	390	37.5	7.5	100	1300	340	37.5	7.5	80	1000	210	24	4.8	70	890	230	37.5	5
Depth of cut																				

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work.
   When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient.
   In these cases the feed and speed should be reduced proportionately.
4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

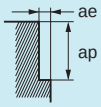
VQMHVRB

Corner radius, End mill, Medium cut length, 4 flute, Irregular helix flutes

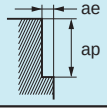
Shoulder milling

When machine rigidity, work material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, work material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Work material	Copper, Copper alloy					Heat resistant alloys Inconel718				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
2	180	29000	2900	3	0.6	40	6400	230	3	0.2
3	180	19000	3000	4.5	0.9	40	4200	240	4.5	0.3
4	180	14000	3000	6	1.2	40	3200	240	6	0.4
5	180	11000	3000	7.5	1.5	40	2500	240	7.5	0.5
6	180	9500	3000	9	1.8	40	2100	250	9	0.6
8	180	7200	3000	12	2.4	40	1600	260	12	0.8
10	180	5700	2700	15	3	40	1300	290	15	1
12	180	4800	2300	18	3.6	40	1100	280	18	1.2
16	180	3600	1900	24	4.8	40	800	200	24	1.6
20	180	2900	1600	30	6	40	640	160	30	2
25	180	2300	1300	37	7.5	40	510	130	37.5	2.5
Depth of cut										

General purpose cutting conditions

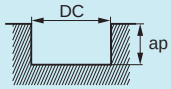
Work material	Copper, Copper alloy					Heat resistant alloys Inconel718				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
2	140	22000	1500	3	0.6	30	4800	110	3	0.2
3	140	15000	1600	4.5	0.9	30	3200	120	4.5	0.3
4	140	11000	1600	6	1.2	30	2400	120	6	0.4
5	140	8900	1600	7.5	1.5	30	1900	120	7.5	0.5
6	140	7400	1600	9	1.8	30	1600	130	9	0.6
8	140	5600	1600	12	2.4	30	1200	130	12	0.8
10	140	4500	1400	15	3	30	950	140	15	1
12	140	3700	1200	18	3.6	30	800	140	18	1.2
16	140	2800	1000	24	4.8	30	600	100	24	1.6
20	140	2200	780	30	6	30	480	81	30	2
25	140	1800	670	37.5	7.5	30	380	64	37.5	2.5
Depth of cut										

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

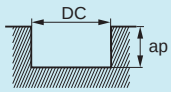
Slotting

When machine rigidity, work material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, work material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				Copper, Copper alloy				Heat resistant alloys Inconel718			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
2	150	24000	1200	2	120	19000	610	2	100	16000	640	2	60	9500	300	1	180	29000	1500	2	30	4800	130	0.6
3	150	16000	1500	3	120	13000	730	3	100	11000	660	3	60	6400	360	1.5	180	19000	1700	3	30	3200	150	0.9
4	150	12000	1900	4	120	9500	910	4	100	8000	700	4	60	4800	460	2	180	14000	2200	4	30	2400	170	1.2
5	150	9500	1900	5	120	7600	910	5	100	6400	720	5	60	3800	460	2.5	180	11000	2200	5	30	1900	170	1.5
6	150	8000	1900	6	120	6400	1000	6	100	5300	740	6	60	3200	510	3	180	9500	2300	6	30	1600	180	1.8
8	150	6000	1700	8	120	4800	960	8	100	4000	800	8	60	2400	480	4	180	7200	2000	8	30	1200	190	2.4
10	150	4800	1500	10	120	3800	840	10	100	3200	900	10	60	1900	420	5	180	5700	1800	10	30	950	210	3
12	150	4000	1300	12	120	3200	770	12	100	2700	860	12	60	1600	380	6	180	4800	1500	12	30	800	200	3.6
16	150	3000	1100	12	120	2400	670	12	100	2000	640	12	60	1200	340	8	180	3600	1300	12	30	600	150	4.8
20	150	2400	860	12	120	1900	530	12	100	1600	510	12	60	950	270	10	180	2900	1000	12	30	480	120	6
25	150	1900	760	12	120	1500	420	12	100	1300	420	12	60	760	210	12	180	2300	920	12	30	380	100	7.5
Depth of cut																								

General purpose cutting conditions

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys SUS304, SUS316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631				Copper, Copper alloy				Heat resistant alloys Inconel718			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
2	100	16000	550	2	80	13000	270	2	60	9500	250	2	50	8000	170	1	120	19000	650	2	25	4000	74	0.6
3	100	11000	670	3	80	8500	310	3	60	6400	250	3	50	5300	200	1.5	120	13000	790	3	25	2700	86	0.9
4	100	8000	840	4	80	6400	410	4	60	4800	280	4	50	4000	250	2	120	9500	1000	4	25	2000	93	1.2
5	100	6400	840	5	80	5100	410	5	60	3800	280	5	50	3200	250	2.5	120	7600	1000	5	25	1600	95	1.5
6	100	5300	840	6	80	4200	440	6	60	3200	300	6	50	2700	290	3	120	6400	1000	6	25	1300	96	1.8
8	100	4000	740	8	80	3200	420	8	60	2400	320	8	50	2000	260	4	120	4800	890	8	25	990	100	2.4
10	100	3200	680	10	80	2500	360	10	60	1900	350	10	50	1600	230	5	120	3800	800	10	25	800	120	3
12	100	2700	570	12	80	2100	330	12	60	1600	340	12	50	1300	210	6	120	3200	680	12	25	660	110	3.6
16	100	2000	480	12	80	1600	300	12	60	1200	250	12	50	990	180	8	120	2400	570	12	25	500	84	4.8
20	100	1600	380	12	80	1300	240	12	60	950	200	12	50	800	150	10	120	1900	450	12	25	400	68	6
25	100	1300	340	12	80	1000	180	12	60	760	160	12	50	640	120	12	120	1500	400	12	25	320	50	7.5
Depth of cut																								

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work.
   When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient.
   In these cases the feed and speed should be reduced proportionately.
4) When the depth of cut is smaller than shown the feed rate can be increased.

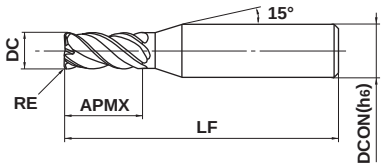
VQMHVRB– Inch sizes

Corner radius end mill, Medium cut length, 4 flute, Irregular helix flutes

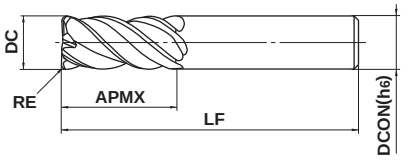
UWC VQ 37° 40°

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			○	◎	○	





Type1



Type2

R					
.0080"≤RE≤.1200"					
±.0006"					
DC<.5000"	DC=.5000"				
0 - .0008"	0 - .0012"				
h6					
.2500"≤DCON≤.3750"	DCON=.5000"				
0 - .00035"	0 - .00043"				

● SMART MIRACLE corner radius, irregular helix end mills for reducing vibration and for delivering stable performance on difficult-to-cut materials and long overhang applications.

Unit : inch

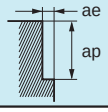
Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVRBD1/8R008	.1250	.0080	.3130	2.0	.2500	4	●	1
VQMHVRBD1/8R010	.1250	.0100	.3130	2.0	.2500	4	●	1
VQMHVRBD3/16R010	.1875	.0100	.4375	2.0	.2500	4	●	1
VQMHVRBD3/16R015	.1875	.0150	.4375	2.0	.2500	4	●	1
VQMHVRBD3/16R020	.1875	.0200	.4375	2.0	.2500	4	●	1
VQMHVRBD3/16R030	.1875	.0300	.4375	2.0	.2500	4	●	1
VQMHVRBD1/4R008	.2500	.0080	.6250	2.5	.2500	4	●	2
VQMHVRBD1/4R010	.2500	.0100	.6250	2.5	.2500	4	●	2
VQMHVRBD1/4R015	.2500	.0150	.6250	2.5	.2500	4	●	2
VQMHVRBD1/4R020	.2500	.0200	.6250	2.5	.2500	4	●	2
VQMHVRBD1/4R030	.2500	.0300	.6250	2.5	.2500	4	●	2
VQMHVRBD5/16R010	.3125	.0100	.7500	2.75	.3125	4	●	2
VQMHVRBD5/16R015	.3125	.0150	.7500	2.75	.3125	4	●	2
VQMHVRBD5/16R020	.3125	.0200	.7500	2.75	.3125	4	●	2
VQMHVRBD5/16R030	.3125	.0300	.7500	2.75	.3125	4	●	2
VQMHVRBD5/16R060	.3125	.0600	.7500	2.75	.3125	4	●	2
VQMHVRBD3/8R010	.3750	.0100	.8750	3.0	.3750	4	●	2
VQMHVRBD3/8R015	.3750	.0150	.8750	3.0	.3750	4	●	2
VQMHVRBD3/8R020	.3750	.0200	.8750	3.0	.3750	4	●	2
VQMHVRBD3/8R030	.3750	.0300	.8750	3.0	.3750	4	●	2
VQMHVRBD3/8R040	.3750	.0400	.8750	3.0	.3750	4	●	2
VQMHVRBD3/8R060	.3750	.0600	.8750	3.0	.3750	4	●	2
VQMHVRBD3/8R090	.3750	.0900	.8750	3.0	.3750	4	●	2
VQMHVRBD1/2R010	.5000	.0100	1.1250	3.5	.5000	4	●	2
VQMHVRBD1/2R015	.5000	.0150	1.1250	3.5	.5000	4	●	2
VQMHVRBD1/2R020	.5000	.0200	1.1250	3.5	.5000	4	●	2
VQMHVRBD1/2R030	.5000	.0300	1.1250	3.5	.5000	4	●	2
VQMHVRBD1/2R060	.5000	.0600	1.1250	3.5	.5000	4	●	2
VQMHVRBD1/2R090	.5000	.0900	1.1250	3.5	.5000	4	●	2
VQMHVRBD1/2R120	.5000	.1200	1.1250	3.5	.5000	4	●	2

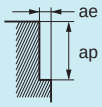
Note) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

● : Inventory maintained.

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Carbon steel (—30HRC) AISI 1035, AISI 1050, ASTM 283						Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21						Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.					
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)			Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)			Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		
1/8	15000	102.0	12000	55.1	.19	.038	12000	49.1	10000	27.2	.19	.038	10000	34.6	8000	18.1	.19	.038
3/16	10000	99.2	8000	51.2	.28	.056	8000	50.4	6700	28.0	.28	.056	6700	35.3	5300	18.5	.28	.056
1/4	7500	99.2	6000	51.2	.38	.075	6000	52.0	5000	28.7	.38	.075	5000	47.2	4000	24.8	.38	.075
5/16	6000	99.2	4800	51.2	.47	.094	4800	52.9	4000	29.1	.47	.094	4000	47.2	3200	24.8	.47	.094
3/8	5000	90.6	4000	47.2	.56	.11	4000	49.1	3300	26.8	.56	.11	3300	49.4	2700	26.8	.56	.11
1/2	3800	74.8	3000	39.0	.75	.15	3000	43.5	2500	24.0	.75	.15	2500	43.3	2000	22.8	.75	.15
Depth of cut																		

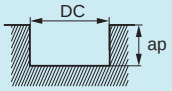
Work material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.						Copper, Copper alloy						Heat resistant alloy Inconel718 etc.					
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)			Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)			Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		
1/8	7500	30.7	7000	18.9	.19	.025	18000	122.0	14000	63.0	.19	.038	4000	9.5	3000	4.7	.19	.013
3/16	5000	31.5	4700	19.7	.28	.038	12000	119.0	9400	63.0	.28	.056	2700	9.8	2000	4.7	.28	.019
1/4	3800	32.9	3500	20.1	.38	.050	9000	119.0	7000	63.0	.38	.075	2000	10.1	1500	5.1	.38	.025
5/16	3000	33.1	2800	20.5	.47	.063	7200	119.0	5600	63.0	.47	.094	1600	10.1	1200	5.1	.47	.031
3/8	2500	30.7	2300	18.5	.56	.075	6000	109.0	4700	55.1	.56	.11	1300	10.6	1000	5.5	.56	.038
1/2	1900	27.5	1800	17.3	.75	.10	4500	88.6	3500	47.2	.75	.15	1000	10.1	750	5.1	.75	.050
Depth of cut																		

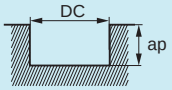
1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloy and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
3) Higher feeds and speeds can be used for smaller depth of cut.
4) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

VQMHVRB– Inch sizes

Corner radius end mill, Medium cut length, 4 flute, Irregular helix flutes

Slotting

Work material	Carbon steel (—30HRC) AISI 1035, AISI 1050, ASTM 283					Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21					Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)	
1/8	15000	59.1	10000	26.0	.13	12000	30.2	8000	13.4	.13	10000	26.8	6000	10.6	.13
3/16	10000	75.6	6700	33.5	.19	8000	35.9	5300	15.7	.19	6700	28.5	4000	11.4	.19
1/4	7500	74.4	5000	32.7	.25	6000	39.7	4000	17.3	.25	5000	29.1	3000	11.4	.25
5/16	6000	66.1	4000	29.1	.31	4800	37.8	3200	16.5	.31	4000	31.5	2400	12.6	.31
3/8	5000	61.4	3300	26.8	.38	4000	34.0	2700	15.0	.38	3300	33.8	2000	13.4	.38
1/2	3800	47.9	2500	20.9	.50	3000	29.8	2000	13.0	.50	2500	31.5	1500	12.6	.50
Depth of cut															

Work material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.					Copper, Copper alloy					Heat resistant alloy Inconel718 etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)	
1/8	6000	15.1	5000	8.3	.063	18000	70.9	12000	31.1	.13	3000	6.14	2500	3.4	.038
3/16	4000	18.3	3300	9.8	.094	12000	90.7	8000	39.4	.19	2000	6.80	1700	3.8	.056
1/4	3000	19.8	2500	11.0	.13	9000	89.3	6000	39.4	.25	1500	7.09	1300	3.9	.075
5/16	2400	18.9	2000	10.2	.16	7200	79.4	4800	35.0	.31	1200	7.56	1000	4.3	.094
3/8	2000	17.0	1700	9.4	.19	6000	73.7	4000	32.3	.38	1000	8.19	840	4.7	.11
1/2	1500	14.9	1300	8.7	.25	4500	56.7	3000	24.8	.50	750	7.56	630	4.3	.15
Depth of cut															

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloy and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
3) Higher feeds and speeds can be used for smaller depth of cut.
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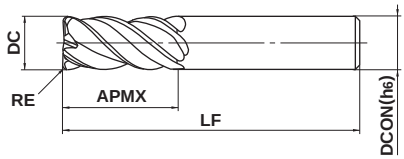
VQMHVRBF

Corner radius end mill, Medium cut length, 4 flute, Irregular helix flutes

UWC VQ 37° 40°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			○	◎		





Type1

R					
0.3≤RE≤2					
±0.015					
DC≤12	DC>12				
0 - 0.02	0 - 0.03				
h6	DCON=6	8≤DCON≤10	12≤DCON≤16		
	0 - 0.008	0 - 0.009	0 - 0.011		

● SMART MIRACLE corner radius, irregular helix end mills for reduced vibration and delivering a stable performance on finish cutting for difficult-to-cut materials such as inconel.

Unit : mm

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVRBFD0600R030	6	0.3	13	50	6	4	●	1
VQMHVRBF**D0600R050**	6	0.5	13	50	6	4	●	1
VQMHVRBF**D0600R100**	6	1	13	50	6	4	●	1
VQMHVRBF**D0800R050**	8	0.5	19	60	8	4	●	1
VQMHVRBF**D0800R100**	8	1	19	60	8	4	●	1
VQMHVRBF**D1000R030**	10	0.3	22	70	10	4	●	1
VQMHVRBF**D1000R050**	10	0.5	22	70	10	4	●	1
VQMHVRBF**D1000R100**	10	1	22	70	10	4	●	1
VQMHVRBF**D1000R200**	10	2	22	70	10	4	●	1
VQMHVRBF**D1200R100**	12	1	26	75	12	4	●	1
VQMHVRBF**D1200R200**	12	2	26	75	12	4	●	1
VQMHVRBF**D1200R300**	12	3	26	75	12	4	●	1
VQMHVRBF**D1600R100**	16	1	35	90	16	4	★	1
VQMHVRBF**D1600R200**	16	2	35	90	16	4	★	1

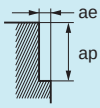
Note) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

VQMHVRBF

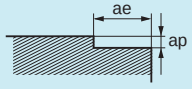
Corner radius end mill, Medium cut length, 4 flute, Irregular helix flutes (for finish cutting)

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT					Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631					Copper, Copper alloy					Heat resistant alloys Inconel718				
DC (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
6	150	8000	2600	9	0.3	120	6400	1300	9	0.3	75	4000	800	9	0.3	180	9500	3000	9	0.3	40	2100	250	9	0.18
8	150	6000	2500	12	0.4	120	4800	1300	12	0.4	75	3000	840	12	0.4	180	7200	3000	12	0.4	40	1600	260	12	0.24
10	150	4800	2300	15	0.5	120	3800	1200	15	0.5	75	2400	770	15	0.5	180	5700	2700	15	0.5	41	1300	290	15	0.3
12	150	4000	1900	18	0.6	120	3200	1200	18	0.6	75	2000	720	18	0.6	180	4800	2300	18	0.6	41	1100	280	18	0.36
16	150	3000	1600	24	0.8	120	2400	960	24	0.8	75	1500	600	24	0.8	180	3600	1900	24	0.8	40	800	200	24	0.48
Depth of cut																									

Face milling

Work material	Carbon steel, Alloy steel, Mild steel S45C, SCM440, SS400, S10C					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel NAK, PX5, SNCM439, SKD, SKT					Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631					Copper, Copper alloy					Heat resistant alloys Inconel718				
DC (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
6	110	5800	1400	0.3	4.8	90	4800	770	0.3	4.8	55	2900	460	0.3	4.8	130	6900	1700	0.3	4.8	30	1600	180	0.18	4.8
8	110	4400	1200	0.4	6.4	90	3600	720	0.4	6.4	55	2200	440	0.4	6.4	130	5200	1500	0.4	6.4	30	1200	190	0.24	6.4
10	110	3500	1100	0.5	8	90	2900	640	0.5	8	55	1800	400	0.5	8	130	4100	1300	0.5	8	30	950	210	0.3	8
12	110	2900	930	0.6	9.6	90	2400	580	0.6	9.6	55	1500	360	0.6	9.6	130	3400	1100	0.6	9.6	30	800	200	0.36	9.6
16	110	2200	790	0.8	12.8	90	1800	500	0.8	12.8	55	1100	310	0.8	12.8	130	2600	940	0.8	12.8	30	600	150	0.48	12.8
Depth of cut																									

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2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

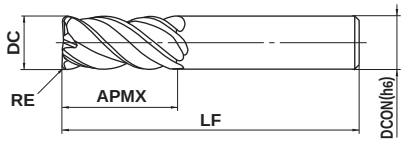
VQMHVRBF – Inch sizes NEW

Corner radius end mill, Medium cut length, 4 flute, Irregular helix flutes

UWC | VQ | 37° 40°

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			○	◎	○	





Type1

R						
	±.0006"					
	DC<.5000"	DC=.5000"				
	0 - .0008"	0 - .0012"				
h6	.250"≤DCON≤.375"	DCON=.500"				
	0 - .00035"	0 - .00043"				

● SMART MIRACLE corner radius, irregular helix end mills for reducing vibration and delivering stable performance on finish cutting for difficult-to-cut materials such as inconel.

Unit : inch

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVRBFD1/4R015	.2500	.0150	.6252	2.5	.2500	4	●	1
VQMHVRBF**D1/4R030**	.2500	.0299	.6252	2.5	.2500	4	●	1
VQMHVRBF**D5/16R015**	.3125	.0150	.7500	2.75	.3126	4	●	1
VQMHVRBF**D5/16R030**	.3125	.0299	.7500	2.75	.3126	4	●	1
VQMHVRBF**D5/16R060**	.3125	.0598	.7500	2.75	.3126	4	●	1
VQMHVRBF**D3/8R015**	.3750	.0150	.8748	3.0	.3752	4	●	1
VQMHVRBF**D3/8R030**	.3750	.0299	.8748	3.0	.3752	4	●	1
VQMHVRBF**D3/8R060**	.3750	.0598	.8748	3.0	.3752	4	●	1
VQMHVRBF**D3/8R090**	.3750	.0902	.8748	3.0	.3752	4	●	1
VQMHVRBF**D1/2R030**	.5000	.0299	1.1252	3.5	.5000	4	●	1
VQMHVRBF**D1/2R060**	.5000	.0598	1.1252	3.5	.5000	4	●	1
VQMHVRBF**D1/2R090**	.5000	.0902	1.1252	3.5	.5000	4	●	1
VQMHVRBF**D1/2R120**	.5000	.1201	1.1252	3.5	.5000	4	●	1

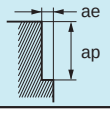
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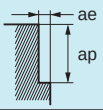
● : Inventory maintained.

VQMHVRBF – Inch sizes NEW

Corner radius end mill, Medium cut length, 4 flute, Irregular helix flutes

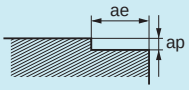
Shoulder milling

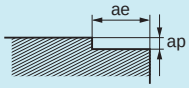
Work material	Carbon steel (—30HRC) AISI 1035, AISI 1050, ASTM 283				Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21				Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.			
DC (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
1/4	7500	94.5	.38	.013	6000	47.2	.38	.013	3800	29.9	.38	.013
5/16	6000	99.2	.47	.016	4800	52.9	.47	.016	3000	33.1	.47	.016
3/8	5000	94.5	.56	.019	4000	50.4	.56	.019	2500	31.5	.56	.019
1/2	3800	71.8	.75	.025	3000	42.5	.75	.025	1900	26.9	.75	.025
Depth of cut												

Work material	Copper, Copper alloy				Heat resistant alloy Inconel718 etc.			
DC (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
1/4	9000	113	.38	.013	2000	9.5	.38	.008
5/16	7200	119	.47	.016	1600	10.1	.47	.009
3/8	6000	113	.56	.019	1300	11.5	.56	.011
1/2	4500	85.0	.75	.025	1000	10.1	.75	.015
Depth of cut								

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloy, and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
3) If the depth of cut is smaller than this table, feed rate can be increased.
4) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

Face milling

Work material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283				Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21				Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.			
DC (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
1/4	5500	52.0	.013	.2	4500	28.3	.013	.2	2800	17.6	.013	.2
5/16	4400	48.5	.016	.25	3600	28.3	.016	.25	2200	17.3	.016	.25
3/8	3700	46.6	.019	.3	3000	26.0	.019	.3	1800	15.6	.019	.3
1/2	2800	35.3	.025	.4	2300	21.7	.025	.4	1400	13.2	.025	.4
Depth of cut												

Work material	Copper, Copper alloy				Heat resistant alloy Inconel718 etc.			
DC (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
1/4	6500	61.4	.013	.2	1500	6.6	.008	.2
5/16	5200	57.3	.016	.25	1200	7.6	.009	.25
3/8	4300	54.2	.019	.3	1000	8.8	.011	.3
1/2	3300	41.6	.025	.4	750	7.6	.015	.4
Depth of cut								

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloy, and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
3) Higher feeds and speeds can be used for smaller depth of cut.
4) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VF2XL

End mill, 2 flute, Long neck





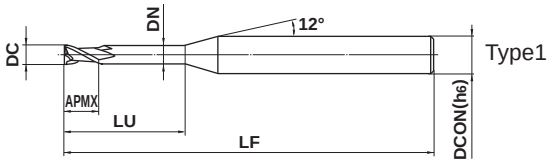







Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				





0.1≤DC≤3				
0 - 0.020				
4≤DCON≤6				
0 - 0.008				

● 2 flute long neck end mill for high-speed machining of hardened steels.

Unit : mm

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VF2XLD0010N005	0.1	0.15	0.5	0.085	45	4	2	★	1
VF2XL**D0020N006**	0.2	0.3	0.6	0.17	45	4	2	★	1
VF2XL**D0020N010**	0.2	0.3	1	0.17	45	4	2	★	1
VF2XL**D0020N015**	0.2	0.3	1.5	0.17	45	4	2	★	1
VF2XL**D0030N010**	0.3	0.5	1	0.27	45	4	2	★	1
VF2XL**D0030N020**	0.3	0.5	2	0.27	45	4	2	★	1
VF2XL**D0030N030**	0.3	0.5	3	0.27	45	4	2	★	1
VF2XL**D0040N010**	0.4	0.6	1	0.36	45	4	2	★	1
VF2XL**D0040N020**	0.4	0.6	2	0.36	45	4	2	★	1
VF2XL**D0040N040**	0.4	0.6	4	0.36	45	4	2	★	1
VF2XL**D0050N020**	0.5	0.8	2	0.46	45	4	2	★	1
VF2XL**D0050N040**	0.5	0.8	4	0.46	45	4	2	★	1
VF2XL**D0050N060**	0.5	0.8	6	0.46	45	4	2	★	1
VF2XL**D0060N020**	0.6	0.9	2	0.56	45	4	2	★	1
VF2XL**D0060N040**	0.6	0.9	4	0.56	45	4	2	★	1
VF2XL**D0060N060**	0.6	0.9	6	0.56	45	4	2	★	1
VF2XL**D0080N040**	0.8	1.2	4	0.76	45	4	2	★	1
VF2XL**D0080N060**	0.8	1.2	6	0.76	45	4	2	★	1
VF2XL**D0080N080**	0.8	1.2	8	0.76	50	4	2	★	1
VF2XL**D0080N100**	0.8	1.2	10	0.76	50	4	2	★	1
VF2XL**D0100N040**	1	1.5	4	0.94	50	4	2	★	1
VF2XL**D0100N060**	1	1.5	6	0.94	50	4	2	★	1
VF2XL**D0100N080**	1	1.5	8	0.94	50	4	2	★	1
VF2XL**D0100N100**	1	1.5	10	0.94	50	4	2	★	1
VF2XL**D0100N120**	1	1.5	12	0.94	50	4	2	★	1
VF2XL**D0150N060**	1.5	2.3	6	1.44	50	4	2	★	1
VF2XL**D0150N080**	1.5	2.3	8	1.44	50	4	2	★	1
VF2XL**D0150N100**	1.5	2.3	10	1.44	50	4	2	★	1
VF2XL**D0150N120**	1.5	2.3	12	1.44	50	4	2	★	1
VF2XL**D0150N160**	1.5	2.3	16	1.44	60	4	2	★	1
VF2XL**D0200N060**	2	3	6	1.9	50	4	2	★	1

★ : Inventory maintained in Japan.

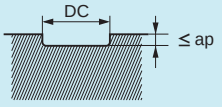
Unit : mm

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VF2XLD0200N080	2	3	8	1.9	50	4	2	★	1
VF2XL**D0200N100**	2	3	10	1.9	50	4	2	★	1
VF2XL**D0200N120**	2	3	12	1.9	50	4	2	★	1
VF2XL**D0200N160**	2	3	16	1.9	60	4	2	★	1
VF2XL**D0200N200**	2	3	20	1.9	60	4	2	★	1
VF2XL**D0300N120**	3	4.5	12	2.9	50	6	2	★	1
VF2XL**D0300N160**	3	4.5	16	2.9	60	6	2	★	1
VF2XL**D0300N200**	3	4.5	20	2.9	60	6	2	★	1

VF2XL

End mill, 2 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

Work material		Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
DC (mm)	**LU** (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut per pass ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut per pass ap (mm)
0.1	0.5	40000	100	3.9	0.002	40000	80	3.1	0.001
0.2	0.6	40000	400	15.7	0.004	40000	360	14.2	0.004
	1	40000	300	11.8	0.003	40000	250	9.8	0.002
	1.5	40000	200	7.9	0.002	40000	150	5.9	0.001
0.3	1	40000	500	19.7	0.006	40000	450	17.7	0.004
	2	40000	400	15.7	0.003	38000	350	13.8	0.002
	3	38000	250	9.8	0.002	36000	200	7.9	0.001
0.4	1	40000	800	31.5	0.008	36000	500	19.7	0.006
	2	40000	500	19.7	0.007	30000	350	13.8	0.005
	4	36000	300	11.8	0.004	27000	200	7.9	0.003
0.5	2	40000	800	31.5	0.01	30000	600	23.6	0.009
	4	36000	600	23.6	0.008	27000	450	17.7	0.007
	6	30000	400	15.7	0.005	22000	300	11.8	0.004
0.6	2	40000	1000	39.4	0.015	30000	700	27.6	0.012
	4	36000	800	31.5	0.01	27000	500	19.7	0.01
	6	30000	600	23.6	0.006	22000	350	13.8	0.006
0.8	4	36000	1200	47.2	0.03	27000	900	35.4	0.02
	6	30000	900	35.4	0.02	22000	650	25.6	0.015
	8	24000	600	23.6	0.01	18000	450	17.7	0.008
	10	20000	400	15.7	0.008	15000	300	11.8	0.005
1	4	32000	1600	63.0	0.05	24000	1100	43.3	0.04
	6	32000	1400	55.1	0.04	24000	1000	39.4	0.03
	8	28000	1000	39.4	0.03	21000	750	29.5	0.02
	10	28000	800	31.5	0.02	21000	600	23.6	0.015
	12	24000	500	19.7	0.02	18000	370	14.6	0.01
1.5	6	22000	1200	47.2	0.08	16000	900	35.4	0.06
	8	22000	1100	43.3	0.07	16000	800	31.5	0.05
	10	22000	1000	39.4	0.06	16000	750	29.5	0.04
	12	20000	800	31.5	0.05	15000	600	23.6	0.03
	16	18000	500	19.7	0.03	13000	350	13.8	0.02
2	6	16000	1000	39.4	0.15	12000	750	29.5	0.15
	8	16000	1000	39.4	0.15	12000	750	29.5	0.1
	10	16000	800	31.5	0.1	12000	600	23.6	0.08
	12	16000	800	31.5	0.08	12000	600	23.6	0.06
	16	15000	600	23.6	0.06	11000	450	17.7	0.05
	20	14000	500	19.7	0.05	10000	350	13.8	0.04
3	12	11000	800	31.5	0.2	8200	600	23.6	0.15
	16	11000	600	23.6	0.15	8200	450	17.7	0.15
	20	11000	500	19.7	0.1	8200	350	13.8	0.1
Depth of cut									

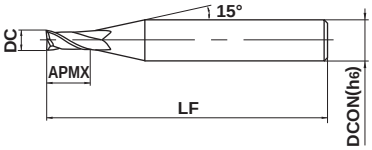
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

VF2MV

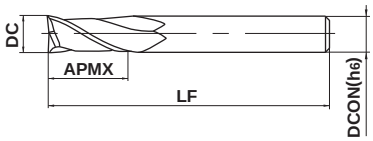
End mill, Medium cut length, 2 flute, Irregular helix flutes

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				





Type1



Type2

0.5≤DC≤6				
0 - 0.020				
4≤DCON≤6				
0 - 0.008				

● An irregular helix 2 flute square end mill suitable for high-speed machining of hardened steel.

Unit : mm

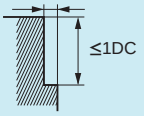
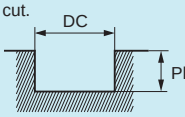
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF2MVD0050	0.5	1.3	40	4	2	●	1
VF2MV**D0100**	1	2.5	40	4	2	●	1
VF2MV**D0150**	1.5	3.8	40	4	2	●	1
VF2MV**D0200**	2	5	40	4	2	●	1
VF2MV**D0250**	2.5	6.3	40	4	2	●	1
VF2MV**D0300**	3	7.5	50	6	2	●	1
VF2MV**D0400**	4	10	50	6	2	●	1
VF2MV**D0500**	5	12.5	50	6	2	●	1
VF2MV**D0600**	6	15	50	6	2	●	2

● : Inventory maintained.

VF2MV

End mill, Medium cut length, 2 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

Work material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1—10, AISI P21 etc.				Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
0.5	40000	1000	39.4	0.015	40000	960	37.8	0.015	30000	600	23.6	0.01
1	40000	2000	78.7	0.06	32000	1600	63.0	0.06	16000	550	21.7	0.05
1.5	40000	3000	118.1	0.12	32000	1900	74.8	0.08	10600	500	19.7	0.08
2	30000	3000	118.1	0.18	24000	1900	74.8	0.10	8100	400	15.7	0.1
2.5	24000	2600	102.4	0.25	19000	1600	63.0	0.13	6400	350	13.8	0.13
3	20000	2300	90.6	0.30	16000	1400	55.1	0.15	5400	300	11.8	0.15
4	15000	2000	78.7	0.40	12000	1200	47.2	0.20	4000	240	9.4	0.2
5	12000	1600	63.0	0.50	9000	900	35.4	0.25	3200	190	7.5	0.2
6	10000	1400	55.1	0.60	7000	700	27.6	0.30	2700	160	6.3	0.2
Depth of cut	Please refer to the list above for depth of cut.   Please refer to the list above for depth of cut.											

1) When slotting, reduce the revolutions by 50 - 70% and the feed rate by 40 - 60%.
2) For austenitic stainless steels, titanium and heat-resistant alloys, VFMHV is recommended.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

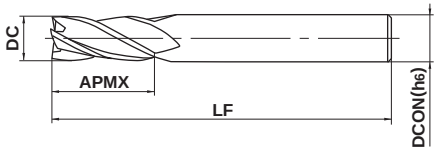
VF4MV

End mill, Medium cut length, 4 flute, Irregular helix flutes

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				

★For austenitic stainless steels, titanium and heat-resistant alloys, the VFMHV is recommended.





Type1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

h6

● An irregular helix 4 flute square end mill suitable for high-speed machining of hardened steel.

Unit : mm

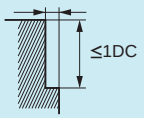
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF4MVD0600	6	15	50	6	4	●	1
VF4MV**D0800**	8	20	60	8	4	●	1
VF4MV**D1000**	10	25	70	10	4	●	1
VF4MV**D1200**	12	30	90	12	4	●	1
VF4MV**D1600**	16	40	100	16	4	★	1
VF4MV**D2000**	20	50	110	20	4	★	1

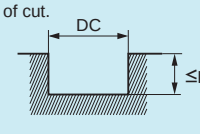
RECOMMENDED CUTTING CONDITIONS

Work material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.				Hardened steel (45−55HRC) AISI H13 etc.				Hardened steel (55−62HRC) AISI D2 etc.			
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
6	10000	2100	82.7	0.60	7000	1400	55.1	0.30	2700	320	12.6	0.20
8	8000	1500	59.1	0.80	5600	1100	43.3	0.40	2000	240	9.4	0.20
10	6400	1400	55.1	1.00	4500	950	37.4	0.50	1600	210	8.3	0.30
12	5400	1200	47.2	1.00	3800	860	33.9	0.50	1300	160	6.3	0.30
16	2400	550	21.7	3.00	1200	280	11.0	0.80	1000	130	5.1	0.30
20	1900	480	18.9	4.00	1000	240	9.4	1.00	800	100	3.9	0.30

Depth of cut

≤Please refer to the list above for depth of cut.





1) When slotting, reduce the revolutions by 50 - 70% and the feed rate by 40 - 60%.
2) For austenitic stainless steels, titanium and heat-resistant alloys, VFMHV is recommended.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

● : Inventory maintained. ★ : Inventory maintained in Japan.

VFMHV

End mill, Medium cut length, 4 flute, Irregular helix flutes







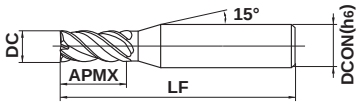
DC<6


DC≥6

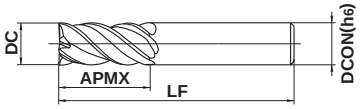


Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○	○		◎	◎		

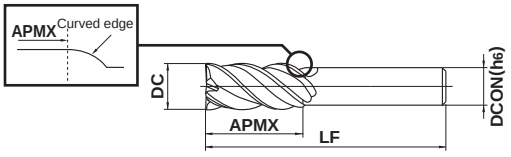




Type1



Type2



Type3



DC≤12	DC>12			
0 - 0.02	0 - 0.03			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● Impact Miracle end mill with irregular helix flutes ensures stable machining of difficult-to-cut materials and with long overhangs.

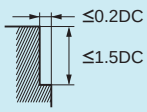
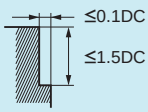
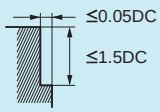
Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMHVD0200	2	4	45	4	4	★	1
VFMHV**D0250**	2.5	5	45	4	4	★	1
VFMHV**D0300**	3	8	45	6	4	●	1
VFMHV**D0350**	3.5	8	45	6	4	●	1
VFMHV**D0400**	4	11	45	6	4	●	1
VFMHV**D0500**	5	13	50	6	4	★	1
VFMHV**D0600**	6	13	50	6	4	★	2
VFMHV**D0600A070**	6	13	70	6	4	★	2
VFMHV**D0700**	7	19	60	8	4	★	1
VFMHV**D0800**	8	19	60	8	4	★	2
VFMHV**D0800A080**	8	19	80	8	4	★	2
VFMHV**D0900**	9	22	70	10	4	★	1
VFMHV**D1000A100S08**	10	22	100	8	4	★	3
VFMHV**D1000**	10	22	70	10	4	★	2
VFMHV**D1000A100**	10	22	100	10	4	★	2
VFMHV**D1100**	11	26	100	10	4	★	3
VFMHV**D1200A110S10**	12	26	110	10	4	★	3
VFMHV**D1200**	12	26	75	12	4	★	2
VFMHV**D1200A110**	12	26	110	12	4	★	2
VFMHV**D1300**	13	26	110	12	4	★	3
VFMHV**D1400A130S12**	14	32	130	12	4	★	3
VFMHV**D1600**	16	35	90	16	4	★	2
VFMHV**D1800A150S16**	18	42	150	16	4	★	3
VFMHV**D2000**	20	45	110	20	4	★	2

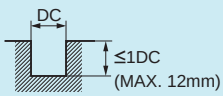
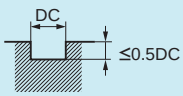
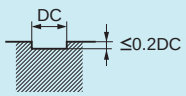
● : Inventory maintained. ★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45—55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
2	21000	1100	43.3	21000	1100	43.3	14000	560	22.0	9600	310	12.2	4800	130	5.1
3	15000	1250	49.2	15000	1250	49.2	10600	850	33.5	7400	380	15.0	4200	200	7.9
4	11000	1400	55.1	11000	1400	55.1	8000	960	37.8	5600	400	15.7	3200	220	8.7
5	9600	1920	75.6	9600	1920	75.6	6400	1020	40.2	4500	430	16.9	2500	250	9.8
6	8000	2240	88.2	8000	2240	88.2	5300	1060	41.7	3700	440	17.3	2100	250	9.8
7	6800	1900	74.8	6800	1900	74.8	4500	1010	39.8	3200	450	17.7	1800	260	10.2
8	6000	1680	66.1	6000	1680	66.1	4000	960	37.8	2800	450	17.7	1600	260	10.2
9	5300	1480	58.3	5300	1480	58.3	3500	840	33.1	2500	450	17.7	1400	220	8.7
10	4800	1440	56.7	4800	1440	56.7	3200	770	30.3	2200	440	17.3	1300	210	8.3
11	4400	1350	53.1	4400	1350	53.1	2900	760	29.9	2000	400	15.7	1200	190	7.5
12	4000	1250	49.2	4000	1250	49.2	2700	760	29.9	1900	380	15.0	1100	180	7.1
13	3700	1180	46.5	3700	1180	46.5	2500	700	27.6	1700	360	14.2	1000	160	6.3
14	3400	1160	45.7	3400	1160	45.7	2300	640	25.2	1600	350	13.8	900	140	5.5
16	3000	1140	44.9	3000	1140	44.9	2000	560	22.0	1400	340	13.4	800	130	5.1
18	2700	970	38.2	2700	970	38.2	1800	550	21.7	1200	340	13.4	700	110	4.3
20	2400	860	33.9	2400	860	33.9	1600	510	20.1	1100	330	13.0	600	100	3.9
Depth of cut	 ≤0.2DC ≤1.5DC						 ≤0.1DC ≤1.5DC			 ≤0.05DC ≤1.5DC					

Slotting

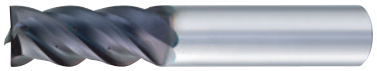
Work material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45—55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
2	17000	680	26.8	10000	400	15.7	9600	310	12.2	4800	130	5.1	3200	80	3.1
3	12000	720	28.3	6900	410	16.1	7400	380	15.0	3200	140	5.5	2700	110	4.3
4	9200	810	31.9	5600	490	19.3	5600	400	15.7	2400	150	5.9	2000	120	4.7
5	7600	1060	41.7	4500	630	24.8	4500	410	16.1	1900	170	6.7	1600	130	5.1
6	6400	1280	50.4	3700	740	29.1	3700	440	17.3	1600	190	7.5	1300	160	6.3
7	5500	1210	47.6	3200	700	27.6	3200	410	16.1	1400	190	7.5	1100	140	5.5
8	4800	1150	45.3	2800	670	26.4	2800	390	15.4	1200	190	7.5	1000	130	5.1
9	4200	1010	39.8	2500	600	23.6	2500	350	13.8	1100	180	7.1	900	130	5.1
10	3800	910	35.8	2200	530	20.9	2200	350	13.8	1000	160	6.3	800	130	5.1
11	3500	900	35.4	2000	530	20.9	2000	320	12.6	900	160	6.3	720	120	4.7
12	3200	900	35.4	1900	530	20.9	1900	300	11.8	800	160	6.3	660	110	4.3
13	2900	810	31.9	1700	480	18.9	1700	290	11.4	730	150	5.9	610	100	3.9
14	2700	760	29.9	1600	450	17.7	1600	290	11.4	680	140	5.5	570	90	3.5
16	2400	670	26.4	1400	390	15.4	1400	280	11.0	600	120	4.7	500	80	3.1
18	2100	670	26.4	1200	380	15.0	1200	270	10.6	530	120	4.7	440	70	2.8
20	1900	610	24.0	1100	350	13.8	1100	260	10.2	480	120	4.7	400	60	2.4
Depth of cut	 DC ≤1DC (MAX. 12mm)						 DC ≤0.5DC			 DC ≤0.2DC					

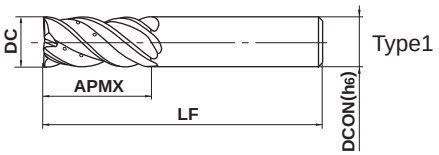
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VFMHVCH

End mill, Medium cut length, 4 flute, Irregular helix flutes, with multiple internal through coolant holes

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
				◎	◎		





16≤DC≤20				
0 - 0.03				
DCON=16	DCON=20			
0 - 0.011	0 - 0.013			

● Vibration control end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMHVCHD1600	16	35	90	16	4	★	1
VFMHVCHD2000	20	45	110	20	4	★	1

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	2000	560	22.0	800	110	4.3
20	1600	510	20.1	600	100	3.9
Depth of cut	≤0.1DC 0.5DC−1.5DC			≤0.05DC 0.5DC−1.5DC		

Slotting

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	1400	170	6.7
20	1100	130	5.1
Depth of cut	DC 0.5DC−1.5DC		

1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.
3) For shoulder milling, climb cutting is recommended.

● : Inventory maintained. ★ : Inventory maintained in Japan.

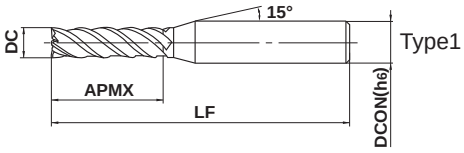
VFJHV

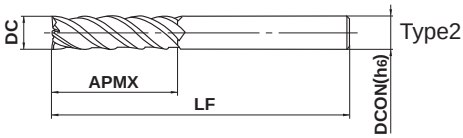
End mill, Semi long cut length, 4 flute, Irregular helix flutes

DC≤6 DC>6

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○	○		◎	◎		







h6

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

- Impact Miracle end mill with irregular helix flutes ensures stable machining of difficult-to-cut materials.
- Suitable for deep machining with long axial depth of cut.

Unit : mm

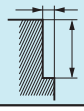
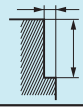
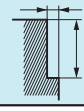
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFJHVD0200	2	8	60	6	4	●	1
VFJHV**D0300**	3	12	60	6	4	●	1
VFJHV**D0400**	4	16	60	6	4	●	1
VFJHV**D0500**	5	20	60	6	4	★	1
VFJHV**D0600**	6	24	60	6	4	★	2
VFJHV**D0800**	8	28	80	8	4	★	2
VFJHV**D1000**	10	35	90	10	4	★	2
VFJHV**D1200**	12	40	100	12	4	★	2
VFJHV**D1600**	16	55	125	16	4	★	2
VFJHV**D2000**	20	60	140	20	4	★	2

VFJHV

End mill, Semi long cut length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (55—62HRC) AISI D2 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
2	16000	530	20.9	10000	320	12.6	10000	300	11.8	7400	140	5.5	3800	55	2.2
3	12000	820	32.3	7600	470	18.5	7600	440	17.3	5600	280	11.0	2500	80	3.1
4	9500	950	37.4	6000	520	20.5	6000	510	20.1	4500	310	12.2	1900	110	4.3
5	7600	1000	39.4	4800	550	21.7	4800	540	21.3	3600	330	13.0	1500	110	4.3
6	6300	1100	43.3	4000	610	24.0	4000	600	23.6	3000	330	13.0	1300	110	4.3
8	4700	1100	43.3	3000	630	24.8	3000	600	23.6	2200	330	13.0	960	100	3.9
10	3800	1000	39.4	2400	610	24.0	2400	570	22.4	1800	310	12.2	760	100	3.9
12	3100	980	38.6	2000	580	22.8	2000	520	20.5	1500	280	11.0	640	80	3.1
16	2300	810	31.9	1500	480	18.9	1500	420	16.5	1100	240	9.4	480	65	2.6
20	1900	740	29.1	1200	430	16.9	1200	390	15.4	900	220	8.7	380	50	2.0
Depth of cut	 ≤0.1DC ≤2.5DC						 ≤0.05DC ≤2.5DC						 ≤0.02DC ≤2.5DC		

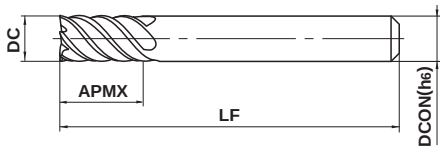
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VF6MHV

End mill, Medium cut length, 6 flute, Irregular helix flutes

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○	○		◎	◎		





Type1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

- Newly developed irregular helix 6 flute geometry reduces vibrations and achieves high efficiency machining.
- Suitable for machining of difficult-to-cut materials such as stainless steel, titanium alloy and inconel.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF6MHVD0600	6	13	50	6	6	★	1
VF6MHV**D0800**	8	19	60	8	6	★	1
VF6MHV**D1000**	10	22	70	10	6	★	1
VF6MHV**D1200**	12	26	75	12	6	★	1
VF6MHV**D1600**	16	32	90	16	6	★	1
VF6MHV**D2000**	20	38	100	20	6	★	1

RECOMMENDED CUTTING CONDITIONS

Side milling

Work material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
6	10600	2900	114.2	8000	2000	78.7	2100	320	12.6
8	8000	2900	114.2	6000	2000	78.7	1600	300	11.8
10	6400	2700	106.3	4800	2000	78.7	1300	260	10.2
12	5300	2700	106.3	4000	2000	78.7	1100	230	9.1
16	4000	2200	86.6	3000	1600	63.0	800	180	7.1
20	3200	1900	74.8	2400	1400	55.1	640	150	5.9
Depth of cut	≤0.1DC ≤1.5DC						≤0.05DC ≤1.5DC		

1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

★ : Inventory maintained in Japan.

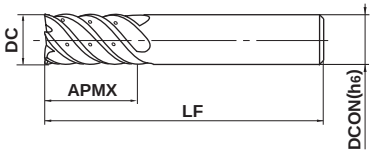
VF6MHVCH

End mill, Medium cut length, 6 flute,
Irregular helix flutes with multiple internal through coolant holes



Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
				◎	◎		





Type1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=10	**DCON=12**	**DCON=16**	**DCON=20**	
0 - 0.009	0 - 0.011	0 - 0.011	0 - 0.013	

h6

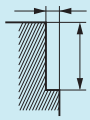
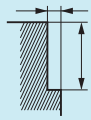
- Vibration control end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

Unit : mm

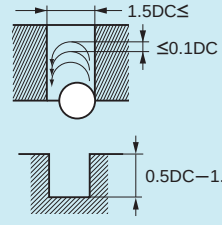
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF6MHVCHD1000	10	22	70	10	6	●	1
VF6MHVCHD1200	12	26	75	12	6	●	1
VF6MHVCHD1600	16	32	90	16	6	★	1
VF6MHVCHD2000	20	38	100	20	6	★	1

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
10	4800	2000	78.7	1300	260	10.2
12	4000	2000	78.7	1100	230	9.1
16	3000	1600	63.0	800	180	7.1
20	2400	1400	55.1	640	150	5.9
Depth of cut	 ≤0.1DC, 0.5DC−1.5DC			 ≤0.05DC, 0.5DC−1.5DC		

Trochoidal milling

Work material	Austenitic Stainless Steel Titanium alloy AISI 304, AISI 316, Ti-6Al-4V etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
10	4800	1400	55.1
12	4000	1200	47.2
16	3000	1100	43.3
20	2400	900	35.4
Depth of cut	 1.5DC≤, ≤0.1DC, 0.5DC−1.5DC		

1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately.
3) Climb cutting is recommended.

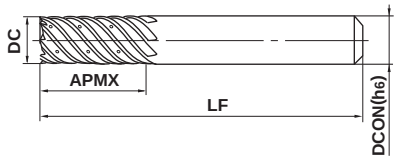
● : Inventory maintained. ★ : Inventory maintained in Japan.

VF8MHVCH

End mill, Medium cut length, 8 flute,
Irregular helix flutes with multiple internal through coolant holes

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
				◎	◎		





Type1

16≤DC≤20				
0 - 0.03				
DCON=16	DCON=20			
0 - 0.011	0 - 0.013			

h6

- Vibration control 8 flute end mill with multiple internal through coolant holes ensures efficient side finishing of difficult-to-cut materials such as stainless steels, titanium and inconel alloys.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF8MHVCHD1600	16	32	90	16	8	★	1
VF8MHVCHD2000	20	38	100	20	8	★	1

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	3000	2100	82.7	800	240	9.4
20	2400	1900	74.8	640	200	7.9
Depth of cut	≤0.08DC 0.5DC−1.5DC			≤0.05DC 0.5DC−1.5DC		

Trochoidal milling

Work material	Austenitic Stainless Steel Titanium alloy AISI 304, AISI 316, Ti-6Al-4V etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	3000	1400	55.1
20	2400	1200	47.2
Depth of cut	1.5DC≤ ≤0.08DC 0.5DC−1.5DC		

1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately.
3) For shoulder milling, climb cutting is recommended.

★ : Inventory maintained in Japan.

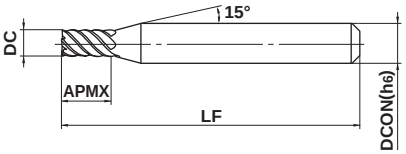
VFSD

End mill, Short cut length, For hardened materials

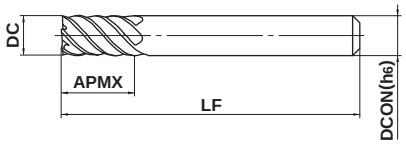
DC<3 DC≥3 DC<3 DC≥3

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				





Type 1



Type 2

h6

1≤DC≤12				
0 - 0.02				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

● End mills with Impact Miracle coating for high hardness materials.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFSDD0100	1	2	45	6	4	●	1
VFSD**D0150**	1.5	3	45	6	4	●	1
VFSD**D0200**	2	4	45	6	4	●	1
VFSD**D0250**	2.5	5	45	6	4	●	1
VFSD**D0300**	3	6	45	6	6	●	1
VFSD**D0350**	3.5	7	45	6	6	●	1
VFSD**D0400**	4	8	45	6	6	●	1
VFSD**D0500**	5	10	50	6	6	●	1
VFSD**D0600**	6	12	50	6	6	●	2
VFSD**D0800**	8	16	60	8	6	●	2
VFSD**D1000**	10	20	70	10	6	●	2
VFSD**D1200**	12	24	75	12	6	●	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

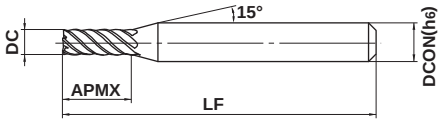
VFMD

End mill, Medium cut length, For hardened materials

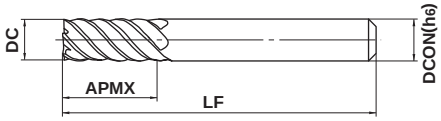
UWC | VF | 30° DC<3 | 45° DC≥3 | DC<3 | DC≥3

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				

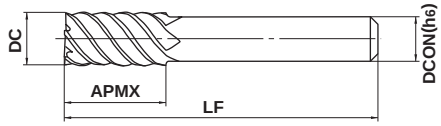




Type 1



Type 2



Type 3

h6

DC≤12	DC>12			
0 - 0.02	0 - 0.03			
DCON=6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● End mills with Impact Miracle coating for high hardness materials.

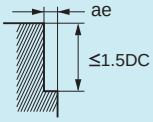
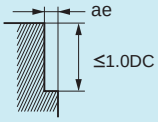
Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMDD0100	1	3.5	60	6	4	●	1
VFMD**D0150**	1.5	5	60	6	4	●	1
VFMD**D0200**	2	7	60	6	4	●	1
VFMD**D0250**	2.5	8	60	6	4	●	1
VFMD**D0300**	3	10	60	6	6	●	1
VFMD**D0400**	4	12	60	6	6	●	1
VFMD**D0500**	5	15	60	6	6	●	1
VFMD**D0600**	6	15	60	6	6	●	2
VFMD**D0800**	8	20	75	8	6	●	2
VFMD**D1000**	10	25	80	10	6	●	2
VFMD**D1200**	12	30	100	12	6	●	2
VFMD**D1400**	14	35	105	12	6	★	3
VFMD**D1500**	15	40	110	16	6	★	1
VFMD**D1600**	16	40	110	16	6	★	2
VFMD**D1800**	18	40	120	16	6	★	3
VFMD**D2000**	20	45	125	20	6	★	2
VFMD**D2200**	22	45	135	20	6	★	3
VFMD**D2500**	25	60	160	25	6	★	2

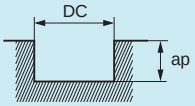
VFSD
End mill, Short cut length, For hardened materials

VFMD
End mill, Medium cut length, For hardened materials

RECOMMENDED CUTTING CONDITIONS

Work material	Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.				Hardened steel (62—70HRC) AISI W1, AISI M2 etc.			
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Width of cut ae (mm)
1	40000	1200	47.2	0.05	40000	800	31.5	0.03	32000	500	19.7	0.02
2	40000	2000	78.7	0.1	24000	1000	39.4	0.05	16000	600	23.6	0.05
3	32000	3800	149.6	0.2	16000	1900	74.8	0.1	11000	1200	47.2	0.05
4	24000	4400	173.2	0.2	12000	2200	86.6	0.1	8000	1300	51.2	0.05
6	16000	5800	228.3	0.3	8000	2900	114.2	0.2	5300	1800	70.9	0.1
8	12000	5800	228.3	0.4	6000	2900	114.2	0.2	4000	1800	70.9	0.1
10	9600	5800	228.3	0.5	4800	2900	114.2	0.3	3200	1800	70.9	0.2
12	8000	4800	189.0	0.6	4000	2400	94.5	0.3	2700	1500	59.1	0.2
16	6000	3600	141.7	0.8	3000	1800	70.9	0.5	2000	1100	43.3	0.3
20	4800	2900	114.2	1.0	2400	1400	55.1	0.5	1600	880	34.6	0.3
25	3800	2300	90.6	1.0	1900	1100	43.3	0.5	1300	720	28.3	0.3
Depth of cut												

Slot milling with small diameter tools

Work material	Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
1	15000	300	11.8	0.1	9500	110	4.3	0.05
2	8000	320	12.6	0.2	4800	190	7.5	0.1
Depth of cut								

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

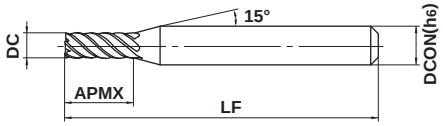
VFMD– Inch sizes

End mill, Medium cut length, For hardened materials

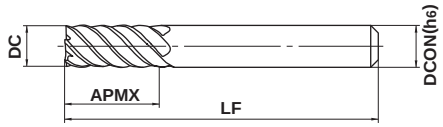
UWC VF 30° DC<1/8 45° 1/8≤DC DC<1/8 DC≤1/8

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				





Type 1



Type 2

h6

DC<.5000"	DC=.5000"			
0 - .0008"	0 - .0012"			
.2500"≤DCON≤.3750"	DCON=.5000"			
0 - .00035"	0 - .00043"			

● End mills with Impact Miracle coating for high hardness materials.

Unit : inch

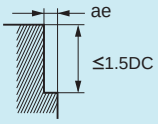
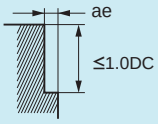
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMDD1/32	.0313	.0938	2.5	.2500	4	●	1
VFMD**D1/16**	.0625	.1875	2.5	.2500	4	●	1
VFMD**D3/32**	.0938	.2813	2.5	.2500	4	●	1
VFMD**D1/8**	.1250	.3750	2.5	.2500	6	●	1
VFMD**D5/32**	.1563	.5000	2.5	.2500	6	●	1
VFMD**D3/16**	.1875	.5630	2.5	.2500	6	●	1
VFMD**D1/4**	.2500	.5630	3.5	.2500	6	●	2
VFMD**D5/16**	.3125	.6875	4.0	.3125	6	●	2
VFMD**D3/8**	.3750	.8125	4.0	.3750	6	●	2
VFMD**D1/2**	.5000	1.0938	4.5	.5000	6	●	2

● : Inventory maintained.

VFMD – Inch sizes

End mill, Medium cut length, For hardened materials

RECOMMENDED CUTTING CONDITIONS

Work material	Hardened steel (45–55HRC) AISI H13 etc.				Hardened steel (55–62HRC) AISI D2 etc.				Hardened steel (62–70HRC) AISI W1, AISI M2 etc.			
DC (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Width of cut ae (inch)
.0313	40000	1100	43.3	.0016	40000	800	31.5	.00094	36000	500	19.6	.00063
.0625	40000	1800	70.8	.0031	30000	960	37.8	.0019	20000	560	22	.0013
.0938	40000	2600	102	.0047	20000	1100	43	.0028	13000	680	26.6	.0019
.1250	30000	4100	161	.0063	15000	2100	82	.0038	10000	1300	49.6	.0025
.1563	24000	4300	170	.0078	12000	2200	86	.0047	8000	1300	51	.0031
.1875	20000	4800	189	.0094	10000	2400	94.5	.0056	6700	1400	55	.0038
.2500	15000	5800	228	.013	7500	2900	114	.0075	5000	1800	70.8	.005
.3125	12000	5800	228	.016	6000	2900	114	.0094	4000	1800	70.8	.0063
.3750	10000	5800	228	.019	5000	2900	114	.011	3300	1800	70.8	.0075
.5000	7500	4500	177	.025	3800	2300	90.5	.015	2500	1400	55	.01
Depth of cut												

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

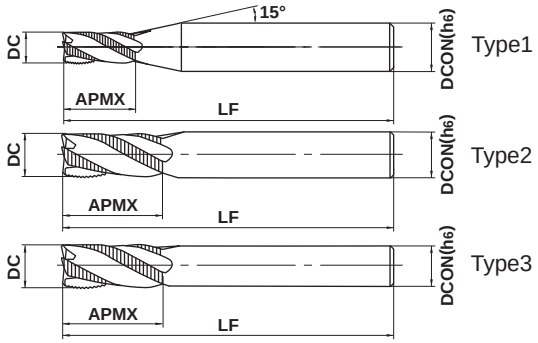
VFSFPR

Roughing end mill, Short cut length, 3—4 flute

UWC VF 30° DC<8 DC≥8

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		◎	◎		





h6

DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013

● Impact Miracle roughing end mills for a wide range of work materials from carbon and alloy steel, hardened steel and difficult-to-cut materials.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFSFPRD0300	3	6	50	6	3	★	1
VFSFPR**D0400**	4	8	50	6	3	★	1
VFSFPR**D0500**	5	10	50	6	3	★	1
VFSFPR**D0600**	6	12	50	6	3	★	2
VFSFPR**D0700**	7	17	60	8	3	★	1
VFSFPR**D0800**	8	17	60	8	4	★	2
VFSFPR**D0900**	9	22	70	10	4	★	1
VFSFPR**D1000S08**	10	22	90	8	4	★	3
VFSFPR**D1000**	10	22	70	10	4	★	2
VFSFPR**D1200S10**	12	27	100	10	4	★	3
VFSFPR**D1200**	12	27	75	12	4	★	2
VFSFPR**D1400**	14	27	75	12	4	★	3
VFSFPR**D1600**	16	33	90	16	4	★	2
VFSFPR**D1800**	18	33	90	16	4	★	3
VFSFPR**D2000**	20	38	100	20	4	★	2

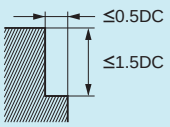
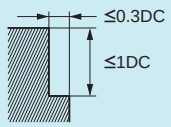
★ : Inventory maintained in Japan.

VFSFPR

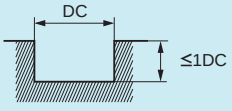
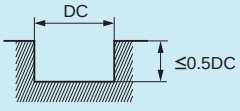
Roughing end mill, Short cut length, 3—4 flute

RECOMMENDED CUTTING CONDITIONS

Side milling

Work material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1—10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti—6Al—4V etc.			Hardened steel (45—55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
3	16000	960	37.8	13000	640	25.2	6400	260	10.2	5300	320	12.6	4200	70	2.8
4	12000	960	37.8	9500	640	25.2	4800	260	10.2	4000	320	12.6	3200	70	2.8
5	9500	960	37.8	7600	640	25.2	3800	260	10.2	3200	320	12.6	2500	70	2.8
6	8000	960	37.8	6400	680	26.8	3200	290	11.4	2700	340	13.4	2100	75	3.0
8	6000	1050	41.3	4800	760	29.9	2400	340	13.4	2000	400	15.7	1600	95	3.7
10	4800	1050	41.3	3800	760	29.9	1900	340	13.4	1600	400	15.7	1300	105	4.1
12	4000	960	37.8	3200	700	27.6	1600	320	12.6	1300	400	15.7	1100	110	4.3
16	3000	840	33.1	2400	620	24.4	1200	300	11.8	1000	360	14.2	800	110	4.3
20	2400	760	29.9	1900	560	22.0	1000	300	11.8	800	320	12.6	600	100	3.9
Depth of cut															

Slotting

Work material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1—10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti—6Al—4V etc.			Hardened steel (45—55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
3	13000	720	28.3	11000	480	18.9	4800	190	7.5	3200	190	7.5	2100	25	1.0
4	9500	720	28.3	8000	480	18.9	3600	190	7.5	2400	190	7.5	1600	25	1.0
5	7600	720	28.3	6400	480	18.9	3200	190	7.5	1900	190	7.5	1300	25	1.0
6	6400	720	28.3	5300	480	18.9	2700	200	7.9	1600	200	7.9	1100	30	1.2
8	4800	800	31.5	4000	520	20.5	2000	220	8.7	1200	220	8.7	800	35	1.4
10	3800	800	31.5	3200	520	20.5	1600	220	8.7	1000	220	8.7	600	35	1.4
12	3200	750	29.5	2700	520	20.5	1300	210	8.3	800	210	8.3	500	40	1.6
16	2400	620	24.4	2000	450	17.7	1000	180	7.1	600	180	7.1	400	45	1.8
20	1900	540	21.3	1600	400	15.7	800	160	6.3	500	160	6.3	300	40	1.6
Depth of cut															

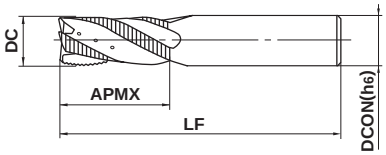
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VFSFPRCH

Roughing end mill, Short cut length, 4 flute, with multiple internal through coolant holes

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
				◎	◎		





Type1

h6

DCON=16	DCON=20			
0 - 0.011	0 - 0.013			

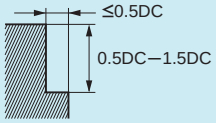
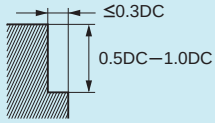
● Roughing end mill with multiple internal through coolant holes suitable for difficult-to-cut materials.

Unit : mm

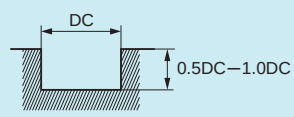
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFSFPRCHD1600	16	33	90	16	4	★	1
VFSFPRCHD2000	20	38	100	20	4	★	1

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	1200	300	11.8	800	110	4.3
20	1000	300	11.8	600	100	3.9
Depth of cut						

Slotting

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	800	100	3.9
20	600	80	3.1
Depth of cut			

1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) If the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.
3) For shoulder milling, climb cutting is recommended.

★ : Inventory maintained in Japan.

VF6SVRCH

Roughing end mill, Short cut length, 6 flute, Irregular helix flutes, with multiple internal through coolant holes



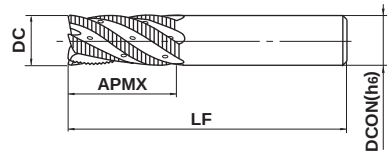






Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
				◎	◎		





Type1

h6

DCON=16	DCON=20			
0 - 0.011	0 - 0.013			

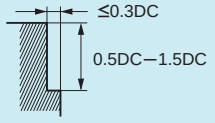
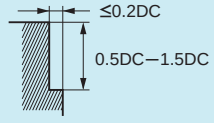
- 6 flute roughing end mill with multiple internal through coolant holes ensures efficient side finishing of difficult-to-cut materials such as stainless steels, titanium and inconel alloys.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF6SVRCHD1600	16	33	90	16	6	★	1
VF6SVRCHD2000	20	38	100	20	6	★	1

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	2400	1200	47.2	800	160	6.3
20	2000	1000	39.4	640	140	5.5
Depth of cut						

1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately.
3) Climb cutting is recommended.

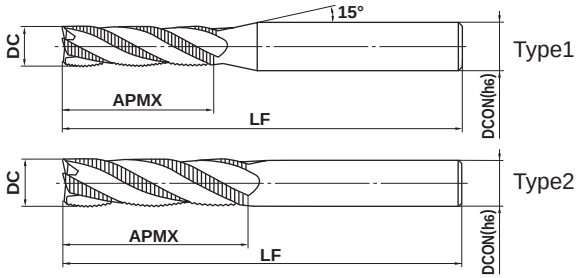
★ : Inventory maintained in Japan.

VFMFPR

Roughing end mill, Medium cut length, 4 flute

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		◎	◎		





h6

DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● Impact Miracle roughing end mills suitable for the machining of deep walled components.

Unit : mm

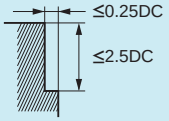
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMFPRD0500	5	15	60	6	4	★	1
VFMFPR**D0600**	6	17	60	6	4	★	2
VFMFPR**D0700**	7	22	75	8	4	★	1
VFMFPR**D0800**	8	28	75	8	4	★	2
VFMFPR**D0900**	9	28	100	10	4	★	1
VFMFPR**D1000**	10	34	100	10	4	★	2
VFMFPR**D1200**	12	40	110	12	4	★	2
VFMFPR**D1600**	16	48	125	16	4	★	2
VFMFPR**D2000**	20	57	140	20	4	★	2

VFMFPR

Roughing end mill, Medium cut length, 4 flute

RECOMMENDED CUTTING CONDITIONS

Side milling

Work material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1—10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti—6Al—4V etc.			Hardened steel (45—55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
5	3800	360	14.2	3200	290	11.4	2500	150	5.9	2500	150	5.9	1900	50	2.0
6	3200	360	14.2	2700	290	11.4	2100	160	6.3	2100	160	6.3	1600	60	2.4
8	2400	450	17.7	2000	360	14.2	1600	160	6.3	1600	160	6.3	1200	70	2.8
10	1900	450	17.7	1600	360	14.2	1300	180	7.1	1300	180	7.1	1000	75	3.0
12	1600	400	15.7	1300	320	12.6	1100	180	7.1	1100	180	7.1	800	80	3.1
16	1200	360	14.2	1000	290	11.4	800	160	6.3	800	160	6.3	600	80	3.1
20	1000	340	13.4	800	270	10.6	600	150	5.9	600	150	5.9	500	80	3.1
Depth of cut															

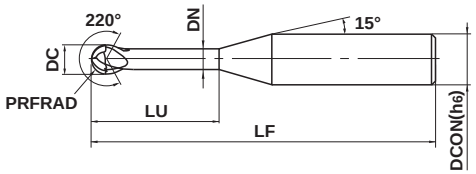
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VF2WB

Wide ball nose, Medium neck, 2 flute

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		◎	◎		





Type1

R	I≤PRFRAD≤3				
	±0.01				
h6	DCON=6				
	0 - 0.008				

● Ball nose end mill suitable for machining of undercut geometries and complex geometries using a 5-axis machine.

Unit : mm

Order Number	PRFRAD	DC	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VF2WBR0100N060	1	2	6	1.6	60	6	2	★	1
VF2WBR0150N080	1.5	3	8	2.4	60	6	2	★	1
VF2WBR0200N100	2	4	10	3.2	60	6	2	★	1
VF2WBR0300N120	3	6	12	4.8	80	6	2	★	1

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.				Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti−6Al−4V etc.				Hardened steel (45−55HRC) AISI H13 etc.			
PRFRAD (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
R1	40000	5000	196.9	0.07	40000	5000	196.9	0.06	32000	2500	98.4	0.05	32000	3000	118.1	0.03
R1.5	32000	5000	196.9	0.12	32000	5000	196.9	0.11	26000	2500	98.4	0.10	26000	3000	118.1	0.07
R2	24000	3800	149.6	0.15	24000	3800	149.6	0.13	20000	2000	98.4	0.12	20000	2800	110.2	0.10
R3	16000	2800	110.2	0.20	16000	2800	110.2	0.18	13000	1500	59.1	0.15	13000	2100	82.7	0.12
Depth of cut	≤0.05PRFRAD (PRFRAD =1) ≤0.1PRFRAD (PRFRAD >1) ≤Please refer to the list above for depth of cut.															

1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.

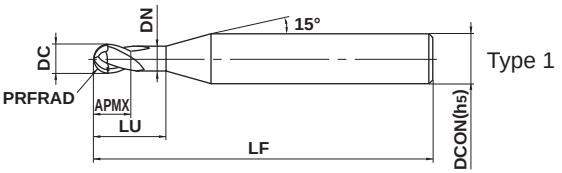
★ : Inventory maintained in Japan.

VF2SSB

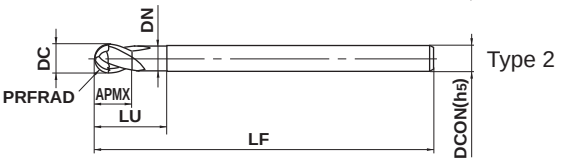
Ball nose, Short cut length, 2 flute, For hardened materials

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎	○	○		





Type 1



Type 2

R				
0.5≤PRFRAD≤6				
±0.005				
1≤DC≤12				
0 - 0.01				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.005	0 - 0.006	0 - 0.008		

- 2 flute ball nose end mills with Impact Miracle coating for high hardness materials.
- Short shank type suitable for use with a shrink fit type holder.

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VF2SSBR0050	0.5	1	1	2	0.94	40	6	2	●	1
VF2SSB**R0075**	0.75	1.5	1.5	3	1.44	40	6	2	●	1
VF2SSB**R0100**	1	2	2	4	1.9	45	6	2	●	1
VF2SSB**R0150**	1.5	3	3	6	2.9	45	6	2	●	1
VF2SSB**R0200**	2	4	4	8	3.9	45	6	2	●	1
VF2SSB**R0250**	2.5	5	5	10	4.9	50	6	2	●	1
VF2SSB**R0300**	3	6	6	12	5.85	50	6	2	●	2
VF2SSB**R0400**	4	8	8	14	7.85	60	8	2	●	2
VF2SSB**R0500**	5	10	10	18	9.7	70	10	2	●	2
VF2SSB**R0600**	6	12	12	22	11.7	75	12	2	●	2

● : Inventory maintained.

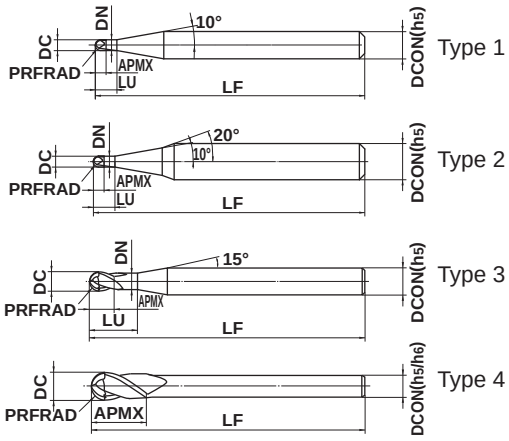
VF2SB

Ball nose, Short cut length, 2 flute, For hardened materials

UWC VF 0° PRFRAD<0.3 30° PRFRAD≥0.3 PRFRAD<0.3 PRFRAD≥0.3

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎	○	○		





R

PRFRAD≤6	PRFRAD>6			
±0.005	±0.010			

DC≤12	DC>12			
0 - 0.01	0 - 0.02			

h5 DCON≤12

DCON=3	4≤DCON≤6	8≤DCON≤10		
0 - 0.004	0 - 0.005	0 - 0.006		

h6 DCON>12

DCON=12	DCON=16	DCON=20		
0 - 0.008	0 - 0.011	0 - 0.013		

● 2 flute ball nose end mills with Impact Miracle coating for high hardness materials.

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VF2SBR0010S04	0.1	0.2	0.2	0.4	0.17	45	4	2	●	1
VF2SB**R0010S06**	0.1	0.2	0.2	0.4	0.17	50	6	2	●	2
VF2SB**R0015S04**	0.15	0.3	0.3	0.6	0.27	45	4	2	●	1
VF2SB**R0015S06**	0.15	0.3	0.3	0.6	0.27	50	6	2	●	2
VF2SB**R0020S04**	0.2	0.4	0.4	0.8	0.36	45	4	2	●	1
VF2SB**R0020S06**	0.2	0.4	0.4	0.8	0.36	50	6	2	●	2
VF2SB**R0030S04**	0.3	0.6	0.6	1.2	0.56	45	4	2	●	3
VF2SB**R0030S06**	0.3	0.6	0.6	1.2	0.56	50	6	2	●	3
VF2SB**R0040S04**	0.4	0.8	0.8	1.6	0.76	45	4	2	●	3
VF2SB**R0040S06**	0.4	0.8	0.8	1.6	0.76	50	6	2	●	3
VF2SB**R0050S04**	0.5	1	1	2	0.94	45	4	2	●	3
VF2SB**R0050S06**	0.5	1	1	2	0.94	50	6	2	●	3
VF2SB**R0060S04**	0.6	1.2	1.2	2.4	1.14	45	4	2	●	3
VF2SB**R0060S06**	0.6	1.2	1.2	2.4	1.14	50	6	2	●	3
VF2SB**R0070S04**	0.7	1.4	1.4	2.8	1.34	45	4	2	●	3
VF2SB**R0070S06**	0.7	1.4	1.4	2.8	1.34	50	6	2	●	3
VF2SB**R0075S04**	0.75	1.5	1.5	3	1.44	45	4	2	●	3
VF2SB**R0075S06**	0.75	1.5	1.5	3	1.44	50	6	2	●	3
VF2SB**R0080S04**	0.8	1.6	1.6	3.2	1.54	45	4	2	●	3
VF2SB**R0080S06**	0.8	1.6	1.6	3.2	1.54	50	6	2	●	3
VF2SB**R0090S04**	0.9	1.8	1.8	3.6	1.74	45	4	2	●	3
VF2SB**R0090S06**	0.9	1.8	1.8	3.6	1.74	50	6	2	●	3
VF2SB**R0100S04**	1	2	2	4	1.9	50	4	2	●	3
VF2SB**R0100S06**	1	2	2	4	1.9	60	6	2	●	3
VF2SB**R0125S06**	1.25	2.5	2.5	5	2.4	60	6	2	●	3
VF2SB**R0150S03**	1.5	3	3	—	—	60	3	2	●	4
VF2SB**R0150S06**	1.5	3	3	6	2.9	70	6	2	●	3
VF2SB**R0200S04**	2	4	4	—	—	60	4	2	●	4
VF2SB**R0200S06**	2	4	4	8	3.9	70	6	2	●	3
VF2SB**R0250S06**	2.5	5	5	10	4.9	80	6	2	●	3
VF2SB**R0300S06**	3	6	12	—	—	80	6	2	●	4

VF2SB

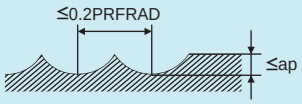
Ball nose, Short cut length, 2 flute, For hardened materials

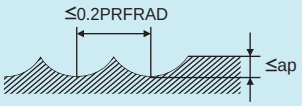
Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VF2SBR0400S08	4	8	14	—	—	90	8	2	●	4
VF2SBR0500S10	5	10	18	—	—	100	10	2	●	4
VF2SBR0600S12	6	12	22	—	—	110	12	2	●	4
VF2SBR0800S16	8	16	30	—	—	140	16	2	★	4
VF2SBR1000S20	10	20	38	—	—	160	20	2	★	4

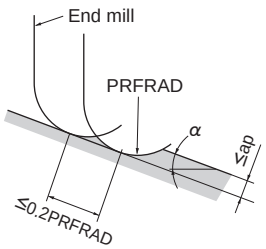
● : Inventory maintained. ★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Work material	Hardened steel (45−55HRC) AISI H13 etc.							Hardened steel (55−62HRC) AISI D2 etc.						
PRFRAD (mm)	α≤15°			α>15°			Depth of cut ap (mm)	α≤15°			α>15°			Depth of cut ap (mm)
	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed			Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		
		(mm/min)	(IPM)		(mm/min)	(IPM)			(mm/min)	(IPM)		(mm/min)	(IPM)	
R 0.1	40000	320	12.6	40000	240	9.4	0.003	40000	320	12.6	40000	160	6.3	0.003
R 0.15	40000	640	25.2	40000	560	22.0	0.01	40000	640	25.2	40000	400	15.7	0.007
R 0.2	40000	1600	63.0	40000	1200	47.2	0.02	40000	1400	55.1	40000	1000	39.4	0.015
R 0.3	40000	3200	126.0	40000	1600	63.0	0.03	40000	2800	110.2	40000	1200	47.2	0.025
R 0.4	40000	6400	252.0	40000	2400	94.5	0.05	40000	4000	157.5	40000	1600	63.0	0.04
R 0.5	40000	8000	315.0	40000	3200	126.0	0.06	40000	5600	220.5	40000	2400	94.5	0.05
R 0.75	40000	9600	378.0	40000	4000	157.5	0.09	40000	7200	283.5	32000	2500	98.4	0.075
R 1	40000	9600	378.0	39000	4700	185.0	0.11	40000	8000	315.0	24000	2400	94.5	0.1
R 1.25	40000	10400	409.4	32000	4500	177.2	0.12	37000	8100	318.9	19000	2300	90.6	0.11
R 1.5	40000	12000	472.4	27000	4300	169.3	0.13	32000	7700	303.1	16000	2200	86.6	0.12
R 2	32000	10880	428.3	20000	3600	141.7	0.15	24000	6200	244.1	12000	1900	74.8	0.13
R 2.5	25000	9000	354.3	16000	2900	114.2	0.2	19000	5300	208.7	9600	1700	66.9	0.15
R 3	21000	8400	330.7	13000	2600	102.4	0.25	16000	4800	189.0	8000	1600	63.0	0.2
R 4	16000	6400	252.0	10000	2000	78.7	0.3	12000	3600	141.7	6000	1200	47.2	0.2
R 5	13000	5200	204.7	8000	1700	66.9	0.5	10000	3200	126.0	4800	960	37.8	0.2
R 6	9000	3600	141.7	6000	1300	51.2	0.5	7000	2200	86.6	3600	720	28.3	0.3
R 8	6000	2400	94.5	4000	1000	39.4	0.5	5000	1600	63.0	2500	500	19.7	0.3
R10	4500	1800	70.9	3000	780	30.7	0.5	4000	1300	51.2	1800	360	14.2	0.3
Depth of cut														

Work material	Hardened steel (62−70HRC) AISI W1, AISI M2 etc.						
PRFRAD (mm)	α≤15°			α>15°			Depth of cut ap (mm)
	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		
		(mm/min)	(IPM)		(mm/min)	(IPM)	
R 0.1	40000	320	12.6	40000	160	6.3	0.002
R 0.15	40000	640	25.2	40000	400	15.7	0.005
R 0.2	40000	1200	47.2	40000	1000	39.4	0.01
R 0.3	40000	2000	78.7	40000	1200	47.2	0.02
R 0.4	40000	2800	110.2	40000	1600	63.0	0.03
R 0.5	40000	3600	141.7	32000	1300	51.2	0.04
R 0.75	32000	4500	177.2	21000	1200	47.2	0.05
R 1	24000	3800	149.6	16000	1000	39.4	0.07
R 1.25	19000	3400	133.9	13000	1000	39.4	0.08
R 1.5	16000	3200	126.0	11000	880	34.6	0.09
R 2	12000	2400	94.5	8000	800	31.5	0.1
R 2.5	9600	2100	82.7	6000	600	23.6	0.1
R 3	8000	1700	66.9	5000	600	23.6	0.11
R 4	6000	1400	55.1	4000	480	18.9	0.11
R 5	4800	1100	43.3	3000	420	16.5	0.12
R 6	3600	860	33.9	2200	310	12.2	0.12
R 8	2500	650	25.6	1500	240	9.4	0.15
R10	1800	470	18.5	1000	160	6.3	0.15
Depth of cut							

1) α is the inclination of the machined surface.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

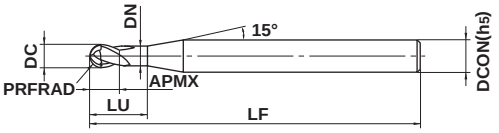


VF2SB – Inch sizes

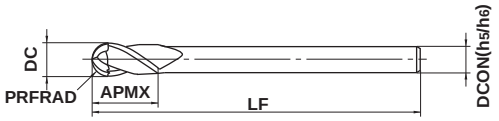
Ball nose, Short cut length, 2 flute, For hardened materials

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎	○	○		





Type 1



Type 2

R

.0156"≤PRFRAD≤.2500"				
±.0002"				

DC<.5000" / DC=.5000"

0 - 0.0004"	0 - 0.0008"			

h5

.2500"≤DCON≤.3750"				
0 - .00024"				

h6

DCON=.5000"				
0 - 0.00043"				

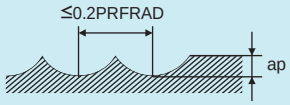
● 2 flute ball nose end mills with Impact Miracle coating for high hardness materials.

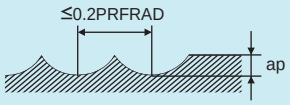
Unit : inch

Order Number	PRFRAD	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VF2SBD1/32	.0156	.0313	.0313	.0625	.0296	2.5	.2500	2	●	1
VF2SB**D1/16**	.0313	.0625	.0625	.1250	.0601	2.5	.2500	2	●	1
VF2SB**D3/32**	.0469	.0938	.0938	.1875	.0898	2.5	.2500	2	●	1
VF2SB**D1/8**	.0625	.1250	.1250	.2500	.1211	3.0	.2500	2	●	1
VF2SB**D3/16**	.0938	.1875	.1875	.3750	.1835	3.0	.2500	2	●	1
VF2SB**D1/4**	.1250	.2500	.5000	–	–	3.5	.2500	2	●	2
VF2SB**D5/16**	.1563	.3125	.6250	–	–	4.0	.3125	2	●	2
VF2SB**D3/8**	.1875	.3750	.7500	–	–	4.0	.3750	2	●	2
VF2SB**D1/2**	.2500	.5000	1.0000	–	–	4.5	.5000	2	●	2

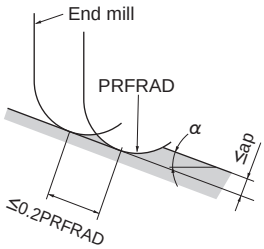
● : Inventory maintained.

RECOMMENDED CUTTING CONDITIONS

Work material	Hardened steel(45−55HRC) AISI H13 etc.							Hardened steel (55−62HRC) AISI D2 etc.						
PRFRAD (inch)	α≤15°			α>15°			Depth of cut ap (inch)	α≤15°			α>15°			Depth of cut ap (inch)
	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed			Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		
		(mm/min)	(IPM)		(mm/min)	(IPM)			(mm/min)	(IPM)		(mm/min)	(IPM)	
R .0156	40000	6400	252	40000	2400	94.5	.0020	40000	4000	157	40000	1600	63	.0016
R .0313	40000	9600	378	40000	4000	157	.0039	40000	8000	315	30000	2400	94.5	.0031
R .0469	40000	10000	394	33000	4600	182	.0047	36000	7900	312	20000	2400	94.5	.0043
R .0625	38000	11000	433	25000	4000	157	.0051	30000	7200	283	15000	2100	82.7	.0047
R .0938	27000	9700	383	17000	3100	122	.0067	20000	5600	220	10000	1800	70.9	.0055
R .1250	20000	8000	315	13000	2600	102	.0098	15000	4500	177	7500	1500	59.1	.0079
R .1563	16000	6400	252	10000	2000	78.7	.0118	12000	3600	142	6000	1200	47.2	.0079
R .1875	13000	5200	205	8400	1700	66.9	.0197	10000	3000	118	5000	1000	39.4	.0079
R .2500	8500	3400	134	5700	1100	43.3	.0197	6500	2100	82.7	3400	680	26.8	.0118
Depth of cut														

Work material	Hardened steel (62−70HRC) AISI W1, AISI M2 etc.						
PRFRAD (inch)	α≤15°			α>15°			Depth of cut ap (inch)
	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		
		(mm/min)	(IPM)		(mm/min)	(IPM)	
R .0156	40000	2800	110	40000	1600	63	.0012
R .0313	30000	4200	165	20000	1200	47.2	.0024
R .0469	20000	3600	142	13000	900	35.4	.0031
R .0625	15000	3000	118	10000	800	31.5	.0035
R .0938	10000	2200	86.6	6300	630	24.8	.0039
R .1250	7500	1700	66.9	4800	580	22.7	.0043
R .1563	6000	1400	55.1	4000	480	18.9	.0043
R .1875	5000	1100	43.3	3200	450	17.6	.0047
R .2500	3400	750	29.4	2000	280	11	.0047
Depth of cut							

1) α is the inclination of the machined surface.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

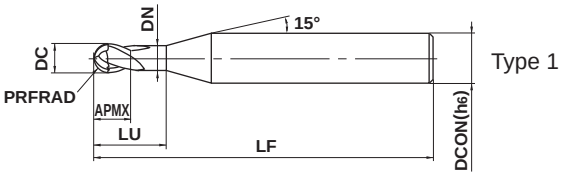


VF2SDB

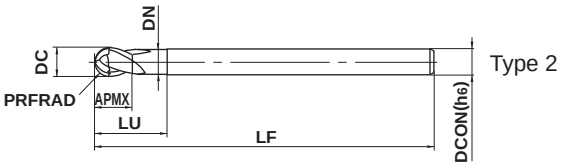
Ball nose, Short cut length, 2 flute, Strong geometry

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	○				





Type 1



Type 2

R	PRFRAD≤6.5	PRFRAD>6.5			
	±0.01	±0.02			
	DC≤12	DC>12			
	0 - 0.02	0 - 0.03			
h6	DCON=3	4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20
	0 - 0.006	0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013

● 2 flute long neck ball nose end mills with Impact Miracle coating for high hardness materials.

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VF2SDBR0050	0.5	1	1	2	0.94	45	4	2	●	1
VF2SDB**R0100S04**	1	2	2	4	1.9	50	4	2	●	1
VF2SDB**R0100**	1	2	2	4	1.9	60	6	2	●	1
VF2SDB**R0150S03**	1.5	3	3	6	2.9	60	3	2	●	2
VF2SDB**R0150**	1.5	3	3	6	2.9	70	6	2	●	1
VF2SDB**R0200S04**	2	4	4	8	3.9	60	4	2	●	2
VF2SDB**R0200**	2	4	4	8	3.9	70	6	2	●	1
VF2SDB**R0250**	2.5	5	5	10	4.9	80	6	2	●	1
VF2SDB**R0300**	3	6	12	22	5.85	80	6	2	●	2
VF2SDB**R0400**	4	8	14	27	7.85	90	8	2	●	2
VF2SDB**R0500**	5	10	18	31	9.7	100	10	2	●	2
VF2SDB**R0600**	6	12	22	35	11.7	110	12	2	●	2
VF2SDB**R0800**	8	16	30	50	15.5	140	16	2	★	2
VF2SDB**R1000**	10	20	38	58	19.5	160	20	2	★	2

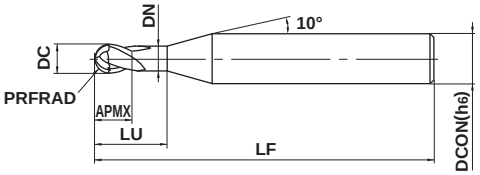
● : Inventory maintained. ★ : Inventory maintained in Japan.

VF2SDBL

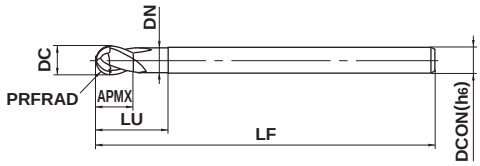
Ball nose, Short cut length, 2 flute, Strong geometry, Long shank

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	○				





Type 1



Type 2

R

PRFRAD≤6.5	PRFRAD>6.5			
±0.01	±0.02			

DC≤12	DC>12			
0 - 0.02	0 - 0.03			

h6

DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● 2 flute ball nose end mill with long shank for general use.

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VF2SDBLR0050	0.5	1	1	2	0.94	60	6	2	●	1
VF2SDBL**R0100**	1	2	2	4	1.9	80	6	2	●	1
VF2SDBL**R0150**	1.5	3	3	6	2.9	90	6	2	●	1
VF2SDBL**R0200**	2	4	4	8	3.9	90	6	2	●	1
VF2SDBL**R0250**	2.5	5	5	10	4.9	110	8	2	●	1
VF2SDBL**R0300**	3	6	12	22	5.85	120	6	2	●	2
VF2SDBL**R0400**	4	8	14	27	7.85	130	8	2	●	2
VF2SDBL**R0500**	5	10	18	31	9.7	140	10	2	●	2
VF2SDBL**R0600**	6	12	22	35	11.7	140	12	2	●	2
VF2SDBL**R0800**	8	16	30	50	15.5	200	16	2	★	2
VF2SDBL**R1000**	10	20	38	58	19.5	200	20	2	★	2

VF2SDB

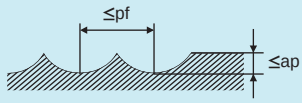
Ball nose, Short cut length, 2 flute, Strong geometry

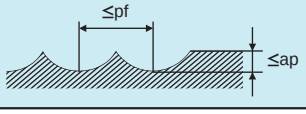
VF2SDBL

Ball nose, Short cut length, 2 flute, Strong geometry, Long shank

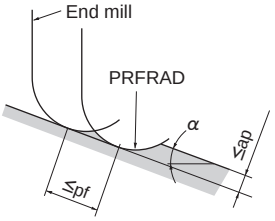
RECOMMENDED CUTTING CONDITIONS

Overhang below 5D (D is end mill diameter)

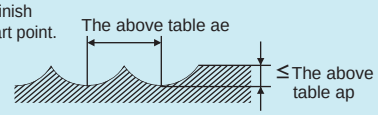
Work material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1—10, AISI P21 etc.								Hardened steel (45—55HRC) AISI H13 etc.							
PRFRAD (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Pick feed pf (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Pick feed pf (mm)
	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)			Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)		
R 0.5	40000	5200	204.7	36000	2300	90.6	0.10	0.25	40000	5200	204.7	36000	2300	90.6	0.10	0.25
R 1	40000	6000	236.2	36000	3500	137.8	0.20	0.50	40000	6000	236.2	36000	3500	137.8	0.20	0.50
R 1.5	29000	4600	181.1	19000	2400	94.5	0.20	0.50	25000	4000	157.5	16000	2000	78.7	0.20	0.50
R 1.5	37000	7000	275.6	24000	3000	118.1	0.30	0.75	37000	7000	275.6	24000	3000	118.1	0.30	0.75
R 2	24000	4300	169.3	15000	2200	86.6	0.25	0.70	19000	3400	133.9	13000	1700	66.9	0.25	0.70
R 2	30000	6500	255.9	19000	2800	110.2	0.40	1.00	28000	6000	236.2	19000	2600	102.4	0.40	1.00
R 2.5	25000	6000	236.2	16000	2600	102.4	0.50	1.30	22000	5000	196.9	16000	2300	90.6	0.50	1.25
R 3	22000	6000	236.2	14000	2400	94.5	0.60	1.80	18000	4500	177.2	12000	1900	74.8	0.60	1.50
R 4	19000	5200	204.7	12000	2200	86.6	0.80	2.40	15000	3800	149.6	9500	1700	66.9	0.80	2.00
R 5	15000	4300	169.3	9500	2000	78.7	1.00	3.00	11000	3000	118.1	7000	1500	59.1	1.00	2.50
R 6	12000	3400	133.9	8000	1800	70.9	1.20	3.60	9000	2400	94.5	6000	1400	55.1	1.20	3.00
R 8	9000	2600	102.4	6000	1500	59.1	1.60	4.80	7000	1900	74.8	4500	1100	43.3	1.60	4.00
R10	7500	2200	86.6	4800	1200	47.2	2.00	6.00	5500	1500	59.1	3600	900	35.4	2.00	5.00
Depth of cut																

Work material	Hardened steel (55—62HRC) AISI D2 etc.							
PRFRAD (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Pick feed pf (mm)
	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)		
R 0.5	40000	5000	196.9	40000	2400	94.5	0.05	0.10
R 1	36000	5000	196.9	24000	2400	94.5	0.10	0.20
R 1.5	17000	2400	94.5	11000	1000	39.4	0.12	0.30
R 1.5	25000	6000	236.2	16000	2200	86.6	0.12	0.30
R 2	12000	1900	74.8	8200	900	35.4	0.13	0.40
R 2	18000	4800	189.0	12000	2000	78.7	0.13	0.40
R 2.5	15000	4200	165.4	9500	1700	66.9	0.15	0.50
R 3	12000	3500	137.8	8000	1600	63.0	0.20	0.60
R 4	9800	3000	118.1	6500	1300	51.2	0.20	0.80
R 5	7500	2400	94.5	5000	1000	39.4	0.20	1.00
R 6	6000	1900	74.8	4000	800	31.5	0.30	1.20
R 8	4500	1500	59.1	3000	600	23.6	0.30	1.60
R10	3600	1200	47.2	2500	500	19.7	0.30	2.00
Depth of cut								

1) α is the inclination of the machined surface.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.



Overhang 7D (D is end mill diameter)

Work material	Alloy steel, Pre-hardened steel (—45HRC) AISI P20, AISI 420					Hardened steel (45—55HRC) AISI H13, AISI 420				
PRFRAD (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
R 1.5x3	16000	2000	78.7	0.10	0.30	13000	1500	59.1	0.10	0.30
R 2x4	13000	2000	78.7	0.15	0.50	10000	1500	59.1	0.15	0.50
R 3	10000	2000	78.7	0.20	1.00	8000	1600	63.0	0.20	0.80
R 4	8000	1800	70.9	0.30	1.50	6400	1400	55.1	0.30	1.20
R 5	6000	1600	63.0	0.40	2.00	4800	1200	47.2	0.40	1.60
R 6	5000	1300	51.2	0.45	2.40	4000	1000	39.4	0.45	2.00
R 8	3800	1000	39.4	0.60	3.00	3100	800	31.5	0.60	2.50
R10	3000	800	31.5	0.80	4.00	2500	650	25.6	0.80	3.00
Depth of cut	Pick feed rates should be chosen according to the surface finish required.The table above should be used as a reference start point. 									

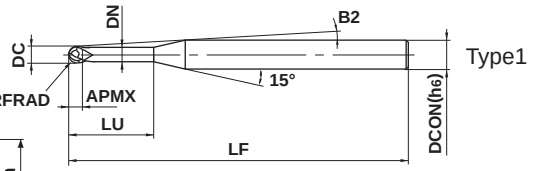
1) The cutting conditions above are a starting reference point only for end mills which outer diameter is the same as the shank diameter.
2) If the rigidity of the machine or the work piece installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.
3) If the depth of cut is shallow, the revolution and feed rate can be increased. If accuracy is important, reduce the feed rate.
4) The above table should not be applied to hardened steels (over 55 HRC hardness)

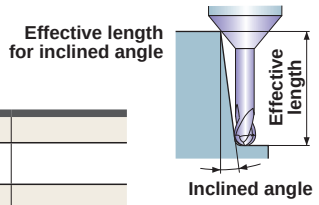
VF2XLBS

Ball nose, Long neck, 2 flute, Short shank

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎		○		







R	0.2≤PRFRAD≤1				
	±0.007				
	0.4≤DC≤2				
	0 - 0.02				
h5	DCON=4				
	0 - 0.005				

- 2 flute long neck ball nose end mill for high-speed machining of hardened steel.
- Short shank type suitable for use with a shrink fit holder.

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
VF2XLBSR0020N010	0.2	0.4	0.32	1	0.36	13.4°	40	4	2	●	1	1.0	1.0	1.1	1.2
VF2XLBS**R0020N020**	0.2	0.4	0.32	2	0.36	11.9°	40	4	2	●	1	2.0	2.1	2.3	2.5
VF2XLBS**R0020N030**	0.2	0.4	0.32	3	0.36	10.7°	40	4	2	●	1	3.1	3.2	3.4	3.7
VF2XLBS**R0020N040**	0.2	0.4	0.32	4	0.36	9.7°	40	4	2	●	1	4.1	4.3	4.6	4.9
VF2XLBS**R0025N040**	0.25	0.5	0.4	4	0.46	9.6°	40	4	2	●	1	4.1	4.3	4.6	4.9
VF2XLBS**R0025N060**	0.25	0.5	0.4	6	0.46	8.1°	40	4	2	●	1	6.2	6.4	6.9	7.4
VF2XLBS**R0030N020**	0.3	0.6	0.48	2	0.56	11.8°	40	4	2	●	1	2.1	2.2	2.3	2.5
VF2XLBS**R0030N030**	0.3	0.6	0.48	3	0.56	10.5°	40	4	2	●	1	3.1	3.3	3.5	3.8
VF2XLBS**R0030N040**	0.3	0.6	0.48	4	0.56	9.5°	40	4	2	●	1	4.2	4.3	4.6	5.0
VF2XLBS**R0030N060**	0.3	0.6	0.48	6	0.56	8.0°	40	4	2	●	1	6.3	6.5	6.9	7.5
VF2XLBS**R0040N040**	0.4	0.8	0.64	4	0.76	9.4°	40	4	2	●	1	4.2	4.3	4.6	5.0
VF2XLBS**R0040N060**	0.4	0.8	0.64	6	0.76	7.8°	40	4	2	●	1	6.3	6.5	6.9	7.5
VF2XLBS**R0050N030**	0.5	1	0.8	3	0.94	10.1°	40	4	2	●	1	3.2	3.3	3.6	3.9
VF2XLBS**R0050N040**	0.5	1	0.8	4	0.94	9.1°	40	4	2	●	1	4.2	4.4	4.8	5.2
VF2XLBS**R0050N060**	0.5	1	0.8	6	0.94	7.5°	40	4	2	●	1	6.3	6.6	7.1	7.7
VF2XLBS**R0050N080**	0.5	1	0.8	8	0.94	6.4°	40	4	2	●	1	8.4	8.8	9.4	10.2
VF2XLBS**R0100N060**	1	2	1.6	6	1.9	6.4°	40	4	2	●	1	6.2	6.5	6.9	7.4
VF2XLBS**R0100N080**	1	2	1.6	8	1.9	5.3°	40	4	2	●	1	8.3	8.7	9.2	9.9
VF2XLBS**R0100N100**	1	2	1.6	10	1.9	4.5°	40	4	2	●	1	10.4	10.8	11.5	12.4

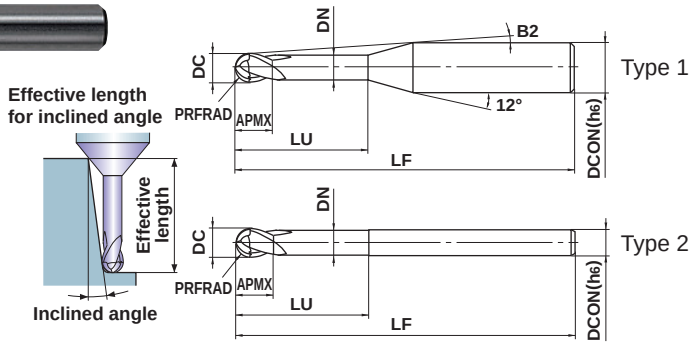
● : Inventory maintained.

VF2XLB

Ball nose, Long neck, 2 flute, For hardened materials

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎		○		





R	PRFRAD≤1	PRFRAD>1			
	±0.007	±0.010			
0.2≤DC≤6					
0 - 0.02					
h5	4≤DCON≤6				
	0 - 0.005				

● 2 flute long neck ball nose end mills with Impact Miracle coating for high hardness materials.

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
VF2XLBR0010N005S04	0.1	0.2	0.16	0.5	0.17	11.5°	50	4	2	●	1	0.5	0.5	0.6	0.6
VF2XLB**R0010N005S06**	0.1	0.2	0.16	0.5	0.17	11.7°	50	6	2	●	1	0.5	0.5	0.6	0.6
VF2XLB**R0010N008S04**	0.1	0.2	0.16	0.75	0.17	11.2°	50	4	2	●	1	0.7	0.8	0.9	1.0
VF2XLB**R0010N010S04**	0.1	0.2	0.16	1	0.17	10.9°	50	4	2	●	1	1.0	1.1	1.2	1.3
VF2XLB**R0010N010S06**	0.1	0.2	0.16	1	0.17	11.3°	50	6	2	●	1	1.0	1.1	1.2	1.3
VF2XLB**R0010N013S04**	0.1	0.2	0.16	1.25	0.17	10.7°	50	4	2	●	1	1.3	1.3	1.5	1.6
VF2XLB**R0010N015S04**	0.1	0.2	0.16	1.5	0.17	10.4°	50	4	2	●	1	1.5	1.6	1.8	2.0
VF2XLB**R0010N015S06**	0.1	0.2	0.16	1.5	0.17	10.9°	50	6	2	●	1	1.5	1.6	1.8	2.0
VF2XLB**R0010N018S04**	0.1	0.2	0.16	1.75	0.17	10.2°	50	4	2	●	1	1.8	1.9	2.1	2.3
VF2XLB**R0010N020S04**	0.1	0.2	0.16	2	0.17	10°	50	4	2	●	1	2.1	2.2	2.4	2.6
VF2XLB**R0010N025S04**	0.1	0.2	0.16	2.5	0.17	9.5°	50	4	2	●	1	2.6	2.7	3.0	3.3
VF2XLB**R0015N010S04**	0.15	0.3	0.24	1	0.27	11°	50	4	2	●	1	1.0	1.1	1.2	1.3
VF2XLB**R0015N010S06**	0.15	0.3	0.24	1	0.27	11.3°	50	6	2	●	1	1.0	1.1	1.2	1.3
VF2XLB**R0015N013S04**	0.15	0.3	0.24	1.25	0.27	10.7°	50	4	2	●	1	1.3	1.3	1.5	1.6
VF2XLB**R0015N015S04**	0.15	0.3	0.24	1.5	0.27	10.4°	50	4	2	●	1	1.5	1.6	1.8	1.9
VF2XLB**R0015N015S06**	0.15	0.3	0.24	1.5	0.27	10.9°	50	6	2	●	1	1.5	1.6	1.8	1.9
VF2XLB**R0015N018S04**	0.15	0.3	0.24	1.75	0.27	10.2°	50	4	2	●	1	1.8	1.9	2.1	2.3
VF2XLB**R0015N020S04**	0.15	0.3	0.24	2	0.27	9.9°	50	4	2	●	1	2.1	2.2	2.4	2.6
VF2XLB**R0015N020S06**	0.15	0.3	0.24	2	0.27	10.6°	50	6	2	●	1	2.1	2.2	2.4	2.6
VF2XLB**R0015N025S04**	0.15	0.3	0.24	2.5	0.27	9.5°	50	4	2	●	1	2.6	2.7	3.0	3.3
VF2XLB**R0015N030S04**	0.15	0.3	0.24	3	0.27	9.1°	50	4	2	●	1	3.1	3.2	3.6	3.9
VF2XLB**R0015N040S04**	0.15	0.3	0.24	4	0.27	8.4°	50	4	2	●	1	4.2	4.3	4.8	5.3
VF2XLB**R0020N010S04**	0.2	0.4	0.32	1	0.36	11°	50	4	2	●	1	1.0	1.0	1.1	1.2
VF2XLB**R0020N010S06**	0.2	0.4	0.32	1	0.36	11.3°	50	6	2	●	1	1.0	1.0	1.1	1.2
VF2XLB**R0020N015S04**	0.2	0.4	0.32	1.5	0.36	10.4°	50	4	2	●	1	1.5	1.6	1.7	1.9
VF2XLB**R0020N015S06**	0.2	0.4	0.32	1.5	0.36	11°	50	6	2	●	1	1.5	1.6	1.7	1.9
VF2XLB**R0020N020S04**	0.2	0.4	0.32	2	0.36	10°	50	4	2	●	1	2.0	2.1	2.3	2.6
VF2XLB**R0020N020S06**	0.2	0.4	0.32	2	0.36	10.6°	50	6	2	●	1	2.0	2.1	2.3	2.6
VF2XLB**R0020N025S04**	0.2	0.4	0.32	2.5	0.36	9.5°	50	4	2	●	1	2.6	2.7	2.9	3.2
VF2XLB**R0020N025S06**	0.2	0.4	0.32	2.5	0.36	10.3°	50	6	2	●	1	2.6	2.7	2.9	3.2
VF2XLB**R0020N030S04**	0.2	0.4	0.32	3	0.36	9.1°	50	4	2	●	1	3.1	3.2	3.5	3.9

VF2XLB

Ball nose, Long neck, 2 flute, For hardened materials

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												30'	1°	2°	3°
VF2XLBR0020N030S06	0.2	0.4	0.32	3	0.36	10°	50	6	2	●	1	3.1	3.2	3.5	3.9
VF2XLB**R0020N040S04**	0.2	0.4	0.32	4	0.36	8.4°	50	4	2	●	1	4.1	4.3	4.7	5.2
VF2XLB**R0020N050S04**	0.2	0.4	0.32	5	0.36	7.8°	50	4	2	●	1	5.2	5.4	5.9	6.6
VF2XLB**R0025N015S04**	0.25	0.5	0.4	1.5	0.46	10.5°	50	4	2	●	1	1.5	1.6	1.7	1.9
VF2XLB**R0025N015S06**	0.25	0.5	0.4	1.5	0.46	11°	50	6	2	●	1	1.5	1.6	1.7	1.9
VF2XLB**R0025N020S04**	0.25	0.5	0.4	2	0.46	10°	50	4	2	●	1	2.0	2.1	2.3	2.6
VF2XLB**R0025N020S06**	0.25	0.5	0.4	2	0.46	10.6°	50	6	2	●	1	2.0	2.1	2.3	2.6
VF2XLB**R0025N025S04**	0.25	0.5	0.4	2.5	0.46	9.5°	50	4	2	●	1	2.6	2.7	2.9	3.2
VF2XLB**R0025N030S04**	0.25	0.5	0.4	3	0.46	9.1°	50	4	2	●	1	3.1	3.2	3.5	3.9
VF2XLB**R0025N030S06**	0.25	0.5	0.4	3	0.46	10°	50	6	2	●	1	3.1	3.2	3.5	3.9
VF2XLB**R0025N035S04**	0.25	0.5	0.4	3.5	0.46	8.7°	50	4	2	●	1	3.6	3.8	4.1	4.5
VF2XLB**R0025N040S04**	0.25	0.5	0.4	4	0.46	8.3°	50	4	2	●	1	4.1	4.3	4.7	5.2
VF2XLB**R0025N040S06**	0.25	0.5	0.4	4	0.46	9.4°	50	6	2	●	1	4.1	4.3	4.7	5.2
VF2XLB**R0025N050S04**	0.25	0.5	0.4	5	0.46	7.7°	50	4	2	●	1	5.2	5.4	5.9	6.5
VF2XLB**R0025N050S06**	0.25	0.5	0.4	5	0.46	8.9°	50	6	2	●	1	5.2	5.4	5.9	6.5
VF2XLB**R0025N060S04**	0.25	0.5	0.4	6	0.46	7.2°	50	4	2	●	1	6.2	6.5	7.1	7.9
VF2XLB**R0025N060S06**	0.25	0.5	0.4	6	0.46	8.4°	60	6	2	●	1	6.2	6.5	7.1	7.9
VF2XLB**R0030N020S04**	0.3	0.6	0.48	2	0.56	9.9°	50	4	2	●	1	2.1	2.2	2.4	2.6
VF2XLB**R0030N020S06**	0.3	0.6	0.48	2	0.56	10.6°	50	6	2	●	1	2.1	2.2	2.4	2.6
VF2XLB**R0030N025S04**	0.3	0.6	0.48	2.5	0.56	9.4°	50	4	2	●	1	2.6	2.7	3.0	3.3
VF2XLB**R0030N030S04**	0.3	0.6	0.48	3	0.56	9°	50	4	2	●	1	3.1	3.3	3.6	3.9
VF2XLB**R0030N030S06**	0.3	0.6	0.48	3	0.56	9.9°	50	6	2	●	1	3.1	3.3	3.6	3.9
VF2XLB**R0030N035S04**	0.3	0.6	0.48	3.5	0.56	8.6°	50	4	2	●	1	3.6	3.8	4.2	4.6
VF2XLB**R0030N040S04**	0.3	0.6	0.48	4	0.56	8.3°	50	4	2	●	1	4.2	4.4	4.8	5.2
VF2XLB**R0030N040S06**	0.3	0.6	0.48	4	0.56	9.3°	50	6	2	●	1	4.2	4.4	4.8	5.2
VF2XLB**R0030N050S04**	0.3	0.6	0.48	5	0.56	7.6°	50	4	2	●	1	5.2	5.4	6.0	6.6
VF2XLB**R0030N050S06**	0.3	0.6	0.48	5	0.56	8.8°	50	6	2	●	1	5.2	5.4	6.0	6.6
VF2XLB**R0030N060S04**	0.3	0.6	0.48	6	0.56	7.1°	50	4	2	●	1	6.3	6.5	7.1	7.9
VF2XLB**R0030N060S06**	0.3	0.6	0.48	6	0.56	8.4°	50	6	2	●	1	6.3	6.5	7.1	7.9
VF2XLB**R0030N070S04**	0.3	0.6	0.48	7	0.56	6.6°	50	4	2	●	1	7.3	7.6	8.3	9.2
VF2XLB**R0030N080S04**	0.3	0.6	0.48	8	0.56	6.2°	50	4	2	●	1	8.3	8.7	9.5	10.6
VF2XLB**R0030N080S06**	0.3	0.6	0.48	8	0.56	7.6°	60	6	2	●	1	8.3	8.7	9.5	10.6
VF2XLB**R0040N020S04**	0.4	0.8	0.64	2	0.76	9.9°	50	4	2	●	1	2.1	2.2	2.3	2.6
VF2XLB**R0040N020S06**	0.4	0.8	0.64	2	0.76	10.6°	50	6	2	●	1	2.1	2.2	2.3	2.6
VF2XLB**R0040N030S04**	0.4	0.8	0.64	3	0.76	8.9°	50	4	2	●	1	3.1	3.3	3.5	3.9
VF2XLB**R0040N030S06**	0.4	0.8	0.64	3	0.76	9.9°	50	6	2	●	1	3.1	3.3	3.5	3.9
VF2XLB**R0040N040S04**	0.4	0.8	0.64	4	0.76	8.2°	50	4	2	●	1	4.2	4.3	4.7	5.2
VF2XLB**R0040N040S06**	0.4	0.8	0.64	4	0.76	9.3°	50	6	2	●	1	4.2	4.3	4.7	5.2
VF2XLB**R0040N050S04**	0.4	0.8	0.64	5	0.76	7.5°	50	4	2	●	1	5.2	5.4	5.9	6.5
VF2XLB**R0040N060S04**	0.4	0.8	0.64	6	0.76	7°	50	4	2	●	1	6.3	6.5	7.1	7.9
VF2XLB**R0040N060S06**	0.4	0.8	0.64	6	0.76	8.3°	50	6	2	●	1	6.3	6.5	7.1	7.9
VF2XLB**R0040N070S04**	0.4	0.8	0.64	7	0.76	6.5°	50	4	2	●	1	7.3	7.6	8.3	9.2
VF2XLB**R0040N080S04**	0.4	0.8	0.64	8	0.76	6.1°	50	4	2	●	1	8.3	8.7	9.5	10.5
VF2XLB**R0040N080S06**	0.4	0.8	0.64	8	0.76	7.5°	50	6	2	●	1	8.3	8.7	9.5	10.5
VF2XLB**R0040N100S04**	0.4	0.8	0.64	10	0.76	5.4°	50	4	2	●	1	10.4	10.9	11.9	13.2
VF2XLB**R0040N100S06**	0.4	0.8	0.64	10	0.76	6.8°	60	6	2	●	1	10.4	10.9	11.9	13.2
VF2XLB**R0050N030S04**	0.5	1	0.8	3	0.94	8.8°	50	4	2	●	1	3.2	3.3	3.6	4.0
VF2XLB**R0050N030S06**	0.5	1	0.8	3	0.94	9.8°	50	6	2	●	1	3.2	3.3	3.6	4.0
VF2XLB**R0050N040S04**	0.5	1	0.8	4	0.94	8°	50	4	2	●	1	4.2	4.4	4.8	5.3
VF2XLB**R0050N040S06**	0.5	1	0.8	4	0.94	9.2°	50	6	2	●	1	4.2	4.4	4.8	5.3
VF2XLB**R0050N050S04**	0.5	1	0.8	5	0.94	7.3°	50	4	2	●	1	5.3	5.5	6.0	6.7

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												30'	1°	2°	3°
VF2XLBR0050N050S06	0.5	1	0.8	5	0.94	8.7°	50	6	2	●	1	5.3	5.5	6.0	6.7
VF2XLBR0050N060S04	0.5	1	0.8	6	0.94	6.8°	50	4	2	●	1	6.3	6.6	7.2	8.0
VF2XLBR0050N060S06	0.5	1	0.8	6	0.94	8.2°	50	6	2	●	1	6.3	6.6	7.2	8.0
VF2XLBR0050N070S04	0.5	1	0.8	7	0.94	6.3°	50	4	2	●	1	7.4	7.7	8.4	9.3
VF2XLBR0050N080S04	0.5	1	0.8	8	0.94	5.9°	50	4	2	●	1	8.4	8.8	9.6	10.6
VF2XLBR0050N080S06	0.5	1	0.8	8	0.94	7.4°	50	6	2	●	1	8.4	8.8	9.6	10.6
VF2XLBR0050N090S04	0.5	1	0.8	9	0.94	5.5°	50	4	2	●	1	9.5	9.9	10.8	12.0
VF2XLBR0050N100S04	0.5	1	0.8	10	0.94	5.2°	50	4	2	●	1	10.5	11.0	12.0	13.3
VF2XLBR0050N100S06	0.5	1	0.8	10	0.94	6.7°	50	6	2	●	1	10.5	11.0	12.0	13.3
VF2XLBR0050N120S04	0.5	1	0.8	12	0.94	4.6°	50	4	2	●	1	12.6	13.2	14.4	15.9
VF2XLBR0050N120S06	0.5	1	0.8	12	0.94	6.1°	60	6	2	●	1	12.6	13.2	14.4	15.9
VF2XLBR0050N140S04	0.5	1	0.8	14	0.94	4.2°	60	4	2	●	1	14.7	15.3	16.8	18.6
VF2XLBR0050N160S04	0.5	1	0.8	16	0.94	3.8°	60	4	2	●	1	16.8	17.5	19.2	21.3
VF2XLBR0050N160S06	0.5	1	0.8	16	0.94	5.3°	70	6	2	●	1	16.8	17.5	19.2	21.3
VF2XLBR0050N180S04	0.5	1	0.8	18	0.94	3.5°	60	4	2	●	1	18.9	19.7	21.6	23.9
VF2XLBR0050N200S04	0.5	1	0.8	20	0.94	3.3°	60	4	2	●	1	21.0	21.9	24.0	26.6
VF2XLBR0050N200S06	0.5	1	0.8	20	0.94	4.6°	70	6	2	●	1	21.0	21.9	24.0	26.6
VF2XLBR0060N060S04	0.6	1.2	0.96	6	1.14	6.6°	50	4	2	★	1	6.3	6.6	7.2	8.0
VF2XLBR0060N060S06	0.6	1.2	0.96	6	1.14	8.1°	50	6	2	★	1	6.3	6.6	7.2	8.0
VF2XLBR0060N080S04	0.6	1.2	0.96	8	1.14	5.7°	50	4	2	★	1	8.4	8.8	9.6	10.6
VF2XLBR0060N080S06	0.6	1.2	0.96	8	1.14	7.3°	50	6	2	★	1	8.4	8.8	9.6	10.6
VF2XLBR0060N100S04	0.6	1.2	0.96	10	1.14	5°	50	4	2	★	1	10.5	11.0	12.0	13.3
VF2XLBR0060N100S06	0.6	1.2	0.96	10	1.14	6.6°	50	6	2	★	1	10.5	11.0	12.0	13.3
VF2XLBR0060N120S04	0.6	1.2	0.96	12	1.14	4.5°	50	4	2	★	1	12.6	13.2	14.4	15.9
VF2XLBR0060N120S06	0.6	1.2	0.96	12	1.14	6°	50	6	2	★	1	12.6	13.2	14.4	15.9
VF2XLBR0060N140S04	0.6	1.2	0.96	14	1.14	4°	60	4	2	★	1	14.7	15.3	16.8	18.6
VF2XLBR0060N160S04	0.6	1.2	0.96	16	1.14	3.7°	60	4	2	★	1	16.8	17.5	19.2	21.2
VF2XLBR0060N160S06	0.6	1.2	0.96	16	1.14	5.2°	70	6	2	★	1	16.8	17.5	19.2	21.2
VF2XLBR0070N080S04	0.7	1.4	1.12	8	1.34	5.5°	50	4	2	★	1	8.4	8.8	9.6	10.6
VF2XLBR0070N120S04	0.7	1.4	1.12	12	1.34	4.3°	50	4	2	★	1	12.6	13.1	14.4	15.9
VF2XLBR0070N160S04	0.7	1.4	1.12	16	1.34	3.5°	60	4	2	★	1	16.8	17.5	19.2	21.2
VF2XLBR0075N060S04	0.75	1.5	1.2	6	1.44	6.3°	50	4	2	●	1	6.3	6.6	7.2	7.9
VF2XLBR0075N060S06	0.75	1.5	1.2	6	1.44	8°	50	6	2	●	1	6.3	6.6	7.2	7.9
VF2XLBR0075N080S04	0.75	1.5	1.2	8	1.44	5.4°	50	4	2	●	1	8.4	8.8	9.6	10.6
VF2XLBR0075N080S06	0.75	1.5	1.2	8	1.44	7.2°	50	6	2	●	1	8.4	8.8	9.6	10.6
VF2XLBR0075N100S04	0.75	1.5	1.2	10	1.44	4.7°	50	4	2	●	1	10.5	11.0	12.0	13.2
VF2XLBR0075N100S06	0.75	1.5	1.2	10	1.44	6.5°	50	6	2	●	1	10.5	11.0	12.0	13.2
VF2XLBR0075N120S04	0.75	1.5	1.2	12	1.44	4.2°	50	4	2	●	1	12.6	13.1	14.4	15.9
VF2XLBR0075N120S06	0.75	1.5	1.2	12	1.44	5.9°	50	6	2	●	1	12.6	13.1	14.4	15.9
VF2XLBR0075N140S04	0.75	1.5	1.2	14	1.44	3.8°	50	4	2	●	1	14.7	15.3	16.8	18.5
VF2XLBR0075N140S06	0.75	1.5	1.2	14	1.44	5.4°	50	6	2	●	1	14.7	15.3	16.8	18.5
VF2XLBR0075N160S04	0.75	1.5	1.2	16	1.44	3.4°	60	4	2	●	1	16.8	17.5	19.2	21.2
VF2XLBR0075N160S06	0.75	1.5	1.2	16	1.44	5°	60	6	2	●	1	16.8	17.5	19.2	21.2
VF2XLBR0075N180S04	0.75	1.5	1.2	18	1.44	3.1°	60	4	2	●	1	18.9	19.7	21.6	23.8
VF2XLBR0075N200S04	0.75	1.5	1.2	20	1.44	2.9°	60	4	2	●	1	21.0	21.9	23.9	*
VF2XLBR0075N200S06	0.75	1.5	1.2	20	1.44	4.3°	70	6	2	●	1	21.0	21.9	23.9	26.5
VF2XLBR0080N080S04	0.8	1.6	1.28	8	1.54	5.3°	50	4	2	★	1	8.4	8.8	9.6	10.5
VF2XLBR0080N120S04	0.8	1.6	1.28	12	1.54	4.1°	50	4	2	★	1	12.6	13.1	14.4	15.9
VF2XLBR0080N160S04	0.8	1.6	1.28	16	1.54	3.3°	60	4	2	★	1	16.8	17.5	19.1	21.2
VF2XLBR0080N200S04	0.8	1.6	1.28	20	1.54	2.8°	60	4	2	★	1	21.0	21.9	23.9	*
VF2XLBR0090N080S04	0.9	1.8	1.44	8	1.74	5.1°	50	4	2	★	1	8.4	8.8	9.6	10.5

* No interference

VF2XLB

Ball nose, Long neck, 2 flute, For hardened materials

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												30'	1°	2°	3°
VF2XLBR0090N120S04	0.9	1.8	1.44	12	1.74	3.9°	50	4	2	★	1	12.6	13.1	14.3	15.8
VF2XLB**R0090N160S04**	0.9	1.8	1.44	16	1.74	3.1°	60	4	2	★	1	16.8	17.5	19.1	21.1
VF2XLB**R0090N200S04**	0.9	1.8	1.44	20	1.74	2.6°	60	4	2	★	1	20.9	21.8	23.9	✶
VF2XLB**R0100N060S04**	1	2	1.6	6	1.9	5.8°	50	4	2	●	1	6.2	6.5	7.0	7.7
VF2XLB**R0100N060S06**	1	2	1.6	6	1.9	7.9°	50	6	2	●	1	6.2	6.5	7.0	7.7
VF2XLB**R0100N080S04**	1	2	1.6	8	1.9	4.9°	50	4	2	●	1	8.3	8.7	9.4	10.4
VF2XLB**R0100N080S06**	1	2	1.6	8	1.9	6.9°	50	6	2	●	1	8.3	8.7	9.4	10.4
VF2XLB**R0100N100S04**	1	2	1.6	10	1.9	4.2°	50	4	2	●	1	10.4	10.9	11.8	13.0
VF2XLB**R0100N100S06**	1	2	1.6	10	1.9	6.2°	50	6	2	●	1	10.4	10.9	11.8	13.0
VF2XLB**R0100N120S04**	1	2	1.6	12	1.9	3.7°	50	4	2	●	1	12.5	13.0	14.2	15.7
VF2XLB**R0100N120S06**	1	2	1.6	12	1.9	5.6°	50	6	2	●	1	12.5	13.0	14.2	15.7
VF2XLB**R0100N140S04**	1	2	1.6	14	1.9	3.3°	50	4	2	●	1	14.6	15.2	16.6	18.3
VF2XLB**R0100N140S06**	1	2	1.6	14	1.9	5.1°	50	6	2	●	1	14.6	15.2	16.6	18.3
VF2XLB**R0100N160S04**	1	2	1.6	16	1.9	2.9°	60	4	2	●	1	16.7	17.4	19.0	✶
VF2XLB**R0100N160S06**	1	2	1.6	16	1.9	4.7°	60	6	2	●	1	16.7	17.4	19.0	21.0
VF2XLB**R0100N180S04**	1	2	1.6	18	1.9	2.7°	60	4	2	●	1	18.8	19.6	21.4	✶
VF2XLB**R0100N180S06**	1	2	1.6	18	1.9	4.4°	60	6	2	●	1	18.8	19.6	21.4	23.6
VF2XLB**R0100N200S04**	1	2	1.6	20	1.9	2.5°	60	4	2	●	1	20.9	21.8	23.8	✶
VF2XLB**R0100N200S06**	1	2	1.6	20	1.9	4.1°	60	6	2	●	1	20.9	21.8	23.8	26.3
VF2XLB**R0100N220S04**	1	2	1.6	22	1.9	2.3°	60	4	2	●	1	22.9	23.9	26.2	✶
VF2XLB**R0100N250S04**	1	2	1.6	25	1.9	2°	70	4	2	★	1	26.1	27.2	✶	✶
VF2XLB**R0100N250S06**	1	2	1.6	25	1.9	3.5°	70	6	2	★	1	26.1	27.2	29.8	32.9
VF2XLB**R0100N300S04**	1	2	1.6	30	1.9	1.7°	70	4	2	★	1	31.3	32.6	✶	✶
VF2XLB**R0100N300S06**	1	2	1.6	30	1.9	3°	80	6	2	★	1	31.3	32.6	35.8	✶
VF2XLB**R0100N350S04**	1	2	1.6	35	1.9	1.5°	80	4	2	★	1	36.5	38.1	✶	✶
VF2XLB**R0125N100S06**	1.25	2.5	2	10	2.4	5.9°	60	6	2	★	1	10.4	10.8	11.8	12.9
VF2XLB**R0125N150S06**	1.25	2.5	2	15	2.4	4.6°	60	6	2	★	1	15.6	16.3	17.8	19.6
VF2XLB**R0125N200S06**	1.25	2.5	2	20	2.4	3.7°	70	6	2	★	1	20.8	21.7	23.8	26.2
VF2XLB**R0125N250S06**	1.25	2.5	2	25	2.4	3.2°	70	6	2	★	1	26.1	27.2	29.7	32.9
VF2XLB**R0125N300S06**	1.25	2.5	2	30	2.4	2.8°	80	6	2	★	1	31.3	32.6	35.7	✶
VF2XLB**R0125N350S06**	1.25	2.5	2	35	2.4	2.4°	80	6	2	★	1	36.5	38.1	41.7	✶
VF2XLB**R0150N080S06**	1.5	3	2.4	8	2.9	6.3°	60	6	2	●	1	8.3	8.6	9.3	10.2
VF2XLB**R0150N100S06**	1.5	3	2.4	10	2.9	5.5°	60	6	2	●	1	10.4	10.8	11.7	12.9
VF2XLB**R0150N120S06**	1.5	3	2.4	12	2.9	4.9°	60	6	2	●	1	12.5	13.0	14.1	15.5
VF2XLB**R0150N140S06**	1.5	3	2.4	14	2.9	4.4°	60	6	2	●	1	14.6	15.2	16.5	18.2
VF2XLB**R0150N160S06**	1.5	3	2.4	16	2.9	4°	60	6	2	●	1	16.7	17.3	18.9	20.8
VF2XLB**R0150N200S06**	1.5	3	2.4	20	2.9	3.4°	70	6	2	●	1	20.8	21.7	23.7	26.1
VF2XLB**R0150N250S06**	1.5	3	2.4	25	2.9	2.8°	70	6	2	●	1	26.1	27.2	29.7	✶
VF2XLB**R0150N300S06**	1.5	3	2.4	30	2.9	2.5°	70	6	2	●	1	31.3	32.6	35.7	✶
VF2XLB**R0150N350S06**	1.5	3	2.4	35	2.9	2.2°	80	6	2	●	1	36.5	38.0	41.7	✶
VF2XLB**R0150N400S06**	1.5	3	2.4	40	2.9	1.9°	90	6	2	●	1	41.7	43.5	✶	✶
VF2XLB**R0175N160S06**	1.75	3.5	2.8	16	3.4	3.6°	60	6	2	★	1	16.7	17.3	18.9	20.8
VF2XLB**R0175N200S06**	1.75	3.5	2.8	20	3.4	3°	70	6	2	★	1	20.8	21.7	23.7	✶
VF2XLB**R0175N250S06**	1.75	3.5	2.8	25	3.4	2.5°	70	6	2	★	1	26.0	27.1	29.6	✶
VF2XLB**R0175N300S06**	1.75	3.5	2.8	30	3.4	2.1°	80	6	2	★	1	31.3	32.6	35.6	✶
VF2XLB**R0175N350S06**	1.75	3.5	2.8	35	3.4	1.9°	80	6	2	★	1	36.5	38.0	✶	✶
VF2XLB**R0175N400S06**	1.75	3.5	2.8	40	3.4	1.7°	90	6	2	★	1	41.7	43.5	✶	✶
VF2XLB**R0200N100S06**	2	4	3.2	10	3.9	4.5°	70	6	2	●	1	10.4	10.8	11.6	12.7
VF2XLB**R0200N120S06**	2	4	3.2	12	3.9	3.9°	70	6	2	●	1	12.5	12.9	14.0	15.4
VF2XLB**R0200N140S06**	2	4	3.2	14	3.9	3.4°	70	6	2	●	1	14.6	15.1	16.4	18.0
VF2XLB**R0200N160S06**	2	4	3.2	16	3.9	3.1°	70	6	2	●	1	16.6	17.3	18.8	20.7

✶ No interference

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												30'	1°	2°	3°
VF2XLBR0200N200S06	2	4	3.2	20	3.9	2.6°	70	6	2	●	1	20.8	21.7	23.6	*
VF2XLBR0200N250S06	2	4	3.2	25	3.9	2.1°	70	6	2	●	1	26.0	27.1	29.6	*
VF2XLBR0200N300S06	2	4	3.2	30	3.9	1.8°	70	6	2	●	1	31.2	32.6	*	*
VF2XLBR0200N350S06	2	4	3.2	35	3.9	1.6°	80	6	2	●	1	36.5	38.0	*	*
VF2XLBR0200N400S06	2	4	3.2	40	3.9	1.4°	90	6	2	★	1	41.7	43.5	*	*
VF2XLBR0200N450S06	2	4	3.2	45	3.9	1.2°	90	6	2	★	1	46.9	48.9	*	*
VF2XLBR0200N500S06	2	4	3.2	50	3.9	1.1°	100	6	2	★	1	52.1	54.3	*	*
VF2XLBR0250N200S06	2.5	5	4	20	4.9	1.5°	70	6	2	●	1	20.8	21.6	*	*
VF2XLBR0250N250S06	2.5	5	4	25	4.9	1.2°	70	6	2	●	1	26.0	27.1	*	*
VF2XLBR0250N300S06	2.5	5	4	30	4.9	1°	80	6	2	●	1	31.2	*	*	*
VF2XLBR0250N350S06	2.5	5	4	35	4.9	0.9°	80	6	2	★	1	36.4	*	*	*
VF2XLBR0300N300S06	3	6	4.8	30	5.85	—	80	6	2	●	2	*	*	*	*
VF2XLBR0300N400S06	3	6	4.8	40	5.85	—	90	6	2	●	2	*	*	*	*
VF2XLBR0300N500S06	3	6	4.8	50	5.85	—	100	6	2	●	2	*	*	*	*

* No interference

VF2XLBS

Ball nose, Long neck, 2 flute, Short shank

VF2XLB

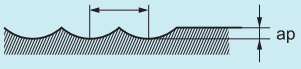
Ball nose, Long neck, 2 flute, For hardened materials

RECOMMENDED CUTTING CONDITIONS

Work material		Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
PRFRAD (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
R 0.1	0.5	40000	300	11.8	0.003	40000	300	11.8	0.002
	1	40000	300	11.8	0.002	40000	300	11.8	0.002
	1.5	40000	300	11.8	0.001	40000	200	7.9	0.001
	2	40000	200	7.9	0.001	40000	100	3.9	0.001
	2.5	40000	100	3.9	0.001	40000	60	2.4	0.001
R 0.15	1	40000	500	19.7	0.007	40000	500	19.7	0.005
	1.5	40000	500	19.7	0.005	40000	500	19.7	0.003
	2	40000	500	19.7	0.003	40000	500	19.7	0.002
	2.5	40000	400	15.7	0.003	40000	400	15.7	0.002
	3	40000	300	11.8	0.002	40000	300	11.8	0.001
	4	30000	200	7.9	0.002	30000	200	7.9	0.001
R 0.2	1	40000	1400	55.1	0.015	40000	1400	55.1	0.01
	1.5	40000	1000	39.4	0.01	40000	1000	39.4	0.006
	2	40000	1000	39.4	0.01	40000	1000	39.4	0.006
	2.5	40000	700	27.6	0.005	40000	700	27.6	0.003
	3	40000	700	27.6	0.005	40000	700	27.6	0.003
	4	40000	600	23.6	0.004	40000	500	19.7	0.003
	5	40000	400	15.7	0.003	40000	300	11.8	0.002
R 0.25	1.5	40000	2000	78.7	0.02	40000	2000	78.7	0.015
	2	40000	2000	78.7	0.02	40000	2000	78.7	0.015
	3	40000	1200	47.2	0.015	40000	1200	47.2	0.01
	4	36000	900	35.4	0.01	36000	900	35.4	0.007
	5	36000	700	27.6	0.007	36000	600	23.6	0.005
	6	36000	600	23.6	0.006	36000	500	19.7	0.004
R 0.3	2	40000	2800	110.2	0.03	40000	2800	110.2	0.02
	3	40000	2800	110.2	0.03	40000	2800	110.2	0.02
	4	35000	2000	78.7	0.02	35000	2000	78.7	0.015
	5	30000	1000	39.4	0.01	30000	1000	39.4	0.007
	6	30000	800	31.5	0.008	30000	800	31.5	0.005
	7	30000	600	23.6	0.008	30000	600	23.6	0.005
	8	25000	400	15.7	0.006	25000	400	15.7	0.004
R 0.4	2	40000	3500	137.8	0.04	40000	3500	137.8	0.03
	3	40000	3000	118.1	0.04	40000	3000	118.1	0.03
	4	40000	3000	118.1	0.02	40000	3000	118.1	0.015
	6	30000	1600	63.0	0.02	30000	1600	63.0	0.01
	8	25000	1000	39.4	0.01	25000	1000	39.4	0.007
	10	25000	600	23.6	0.008	25000	600	23.6	0.005
R 0.5	3	40000	4000	157.5	0.05	40000	4000	157.5	0.04
	4	40000	4000	157.5	0.05	40000	4000	157.5	0.04
	5	40000	3000	118.1	0.03	40000	3000	118.1	0.02
	6	35000	2000	78.7	0.03	35000	2000	78.7	0.02
	8	30000	1600	63.0	0.02	30000	1600	63.0	0.01
	10	20000	1000	39.4	0.01	20000	1000	39.4	0.01
	12	20000	1000	39.4	0.01	18000	800	31.5	0.008
	14	18000	600	23.6	0.008	18000	480	18.9	0.008
	16	18000	500	19.7	0.008	18000	400	15.7	0.006
	18	13000	300	11.8	0.005	13000	240	9.4	0.004
	20	13000	250	9.8	0.005	13000	200	7.9	0.004
R 0.6	6	40000	4000	157.5	0.05	35000	3500	137.8	0.04
	8	40000	3000	118.1	0.05	27000	2000	78.7	0.04
	10	27000	1900	74.8	0.03	24000	1700	66.9	0.02
	12	16000	1100	43.3	0.02	16000	1000	39.4	0.01
	14	16000	850	33.5	0.01	16000	780	30.7	0.01
	16	15000	500	19.7	0.01	14000	400	15.7	0.006
R 0.7	8	40000	4500	177.2	0.06	28000	3200	126.0	0.05
	12	32000	3000	118.1	0.03	19000	1800	70.9	0.02
	16	15000	1000	39.4	0.02	14000	800	31.5	0.01
R 0.75	6	40000	5000	196.9	0.07	32000	4000	157.5	0.06
	8	40000	5000	196.9	0.07	28000	3500	137.8	0.06
	10	40000	4500	117.2	0.06	21000	2400	94.5	0.04
	12	32000	3400	133.9	0.04	19000	2000	78.7	0.03
	14	16000	1500	59.1	0.04	13000	1200	47.2	0.03
	16	13000	1200	47.2	0.03	13000	1200	47.2	0.02
R 0.75	18	13000	1100	43.3	0.02	10000	800	31.5	0.02
	20	12000	900	35.4	0.02	9000	700	27.6	0.01
R 0.8	8	40000	5000	196.9	0.08	26000	3200	126.0	0.07
	12	35000	3800	149.6	0.05	20000	2100	82.7	0.03
	16	13000	1200	47.2	0.04	12000	1100	43.3	0.02
	20	10000	750	29.5	0.02	8000	600	23.6	0.01
R 0.9	8	40000	5000	196.9	0.09	25000	3100	122.0	0.08
	12	36000	3800	149.6	0.06	18000	1900	74.8	0.04
	16	25000	2500	98.4	0.04	14000	1300	51.2	0.025
	20	10000	1000	39.4	0.03	8000	800	31.5	0.02
R 1	6	40000	6000	236.2	0.1	24000	3400	133.9	0.1
	8	40000	5000	196.9	0.1	24000	3000	118.1	0.1
	10	40000	5000	196.9	0.08	24000	3000	118.1	0.07
	12	40000	5000	196.9	0.08	24000	2600	102.4	0.05
	14	40000	5000	196.9	0.06	21000	2300	90.6	0.05
	16	32000	3500	137.8	0.05	16000	1700	66.9	0.03
	18	24000	2400	94.5	0.04	13000	1300	51.2	0.03
	20	10000	1000	39.4	0.04	10000	1000	39.4	0.03
	22	10000	1000	39.4	0.04	10000	1000	39.4	0.02
	25	10000	1000	39.4	0.04	8000	800	31.5	0.02
	30	10000	800	31.5	0.02	8000	800	31.5	0.015
	35	10000	500	19.7	0.02	8000	400	15.7	0.01
R 1.25	10	36000	5000	196.9	0.12	20000	2600	102.4	0.11
	15	36000	4600	181.1	0.08	18000	2000	78.7	0.075
	20	26000	3000	118.1	0.07	13000	1400	55.1	0.05
	25	10000	1100	43.3	0.06	8000	800	31.5	0.04
	30	8000	800	31.5	0.05	7000	700	27.6	0.03
	35	8000	500	19.7	0.03	5000	400	15.7	0.03
R 1.5	8	32000	6400	252.0	0.15	16000	3000	118.1	0.15
	10	32000	5100	200.8	0.15	16000	2200	86.6	0.15
	12	32000	5100	200.8	0.13	16000	2200	86.6	0.13
	14	32000	4500	177.2	0.13	16000	2200	86.6	0.1
	16	32000	4500	177.2	0.1	16000	1800	70.9	0.1
	20	27000	3800	149.6	0.1	14000	1600	63.0	0.06
	25	21000	2700	106.3	0.08	11000	1200	47.2	0.06
	30	9000	1000	39.4	0.08	7000	700	27.6	0.05
	35	6000	700	27.6	0.06	6000	600	23.6	0.04
	40	6000	600	23.6	0.04	5000	400	15.7	0.03
R 1.75	16	28000	4200	165.4	0.13	14000	1600	63.0	0.13
	20	26000	3800	149.6	0.13	13000	1600	63.0	0.11
	25	23000	3300	129.9	0.12	11000	1200	47.2	0.08
	30	13000	1900	74.8	0.09	9000	1000	39.4	0.07
	35	9000	1200	47.2	0.08	6000	600	23.6	0.06
	40	8500	1100	43.3	0.07	5500	500	19.7	0.04
R 2	10	24000	4800	189.0	0.2	12000	2200	86.6	0.2
	12	24000	4800	189.0	0.2	12000	2200	86.6	0.2
	14	24000	3800	149.6	0.15	12000	1500	59.1	0.15
	16	24000	3800	149.6	0.15	12000	1500	59.1	0.15
	20	24000	3800	149.6	0.15	12000	1500	59.1	0.15
	25	24000	3800	149.6	0.15	10000	1100	43.3	0.1
	30	20000	3000	118.1	0.1	10000	1100	43.3	0.08
	35	12000	1700	66.9	0.1	8000	900	35.4	0.08
	40	11000	1500	59.1	0.1	5000	500	19.7	0.06
	45	10000	1300	51.2	0.08	5000	500	19.7	0.05
	50	8000	1000	39.4	0.05	4000	400	15.7	0.04
R 2.5	20	19000	3400	133.9	0.2	10000	1400	55.1	0.2
	25	19000	3400	133.9	0.2	10000	1400	55.1	0.2
	30	19000	3200	126.0	0.15	8000	1000	39.4	0.15
	35	16000	2700	106.3	0.1	8000	900	35.4	0.1
R 3	30	16000	3500	137.8	0.2	8000	1000	39.4	0.2
	40	16000	3000	118.1	0.15	8000	800	31.5	0.15
	50	16000	2700	106.3	0.15	6000	500	19.7	0.15

Depth of cut

≤0.1PRFRAD (PRFRAD ≤1)
≤0.2PRFRAD (PRFRAD >1)



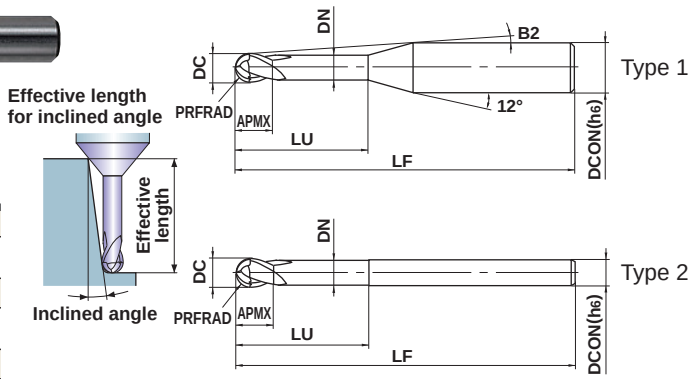
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

VF2XLB – Inch sizes

Ball nose, Long neck, 2 flute, For hardened materials

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎		○		





R	.0156"≤PRFRAD≤.1250"				
	±0.002"				
	.0313"≤DC≤.2500"				
	0 - 0.0008"				
h5	DCON=.2500"				
	0 - 0.00024"				

● 2 flute long neck ball nose end mills with Impact Miracle coating for high hardness materials.

Unit : inch

Order Number	PRFRAD	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
VF2XLB D1/32N4D	.0156	.0313	.0313	.1250	.0296	9.9°	2.5	.2500	2	●	1	.130	.134	.146	.161
VF2XLB **D1/32N6D**	.0156	.0313	.0313	.1875	.0296	9.1°	2.5	.2500	2	●	1	.197	.205	.221	.244
VF2XLB **D1/16N4D**	.0313	.0625	.0625	.2500	.0601	8.0°	2.5	.2500	2	●	1	.264	.276	.299	.331
VF2XLB **D1/16N6D**	.0313	.0625	.0625	.3750	.0601	6.8°	2.5	.2500	2	●	1	.394	.409	.449	.496
VF2XLB **D3/32N4D**	.0469	.0938	.0938	.3750	.0898	6.4°	2.5	.2500	2	●	1	.390	.406	.441	.484
VF2XLB **D3/32N6D**	.0469	.0938	.0938	.5625	.0898	5.1°	2.5	.2500	2	●	1	.587	.610	.665	.736
VF2XLB **D1/8N4D**	.0625	.1250	.1250	.5000	.1211	4.9°	3.0	.2500	2	●	1	.520	.539	.591	.646
VF2XLB **D1/8N6D**	.0625	.1250	.1250	.7500	.1211	3.7°	3.0	.2500	2	●	1	.780	.815	.886	.980
VF2XLB **D3/16N4D**	.0938	.1875	.1875	.7500	.1835	2.3°	3.0	.2500	2	●	1	.780	.811	.882	*
VF2XLB **D3/16N6D**	.0938	.1875	.1875	1.1250	.1835	1.6°	3.0	.2500	2	●	1	1.169	1.221	*	*
VF2XLB **D1/4N4D**	.1250	.2500	.2500	1.0000	.2441	–	3.5	.2500	2	●	2	*	*	*	*
VF2XLB **D1/4N6D**	.1250	.2500	.2500	1.5000	.2441	–	3.5	.2500	2	●	2	*	*	*	*

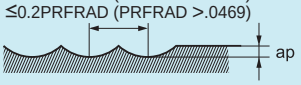
* No interference

● : Inventory maintained.

VF2XLB – Inch sizes

Ball nose, Long neck, 2 flute, For hardened materials

RECOMMENDED CUTTING CONDITIONS

Work material		Hardened steel (45–55HRC) AISI H13 etc.				Hardened steel (55–62HRC) AISI D2 etc.			
PRFRAD (inch)	**LU** (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)
R .0156	.1250	40000	3000	118	.0016	40000	3000	118	.0012
R .0156	.1875	32000	1700	67	.0012	32000	1700	67	.0004
R .0313	.2500	40000	5000	197	.0031	26000	3300	129	.0028
R .0313	.3750	36000	3900	153	.0024	20000	2200	86	.0012
R .0469	.3750	37000	5200	204	.0047	20000	2600	102	.0043
R .0469	.5625	37000	4800	189	.0031	20000	2200	86.6	.0030
R .0625	.5000	30000	4800	189	.0051	15000	2100	82.6	.0051
R .0625	.7500	30000	4200	165	.0039	13000	1500	59	.0024
R .0938	.7500	20000	3600	142	.0079	10000	1400	55.1	.0071
R .0938	1.1250	20000	3400	134	.0059	8400	1100	43.3	.0055
R .1250	1.0000	15000	3300	130	.0079	7500	950	37.2	.0079
R .1250	1.5000	15000	3000	118	.0059	7500	750	29.5	.0059
Depth of cut		≤0.1PRFRAD (PRFRAD ≤.0469) ≤0.2PRFRAD (PRFRAD >.0469) 							

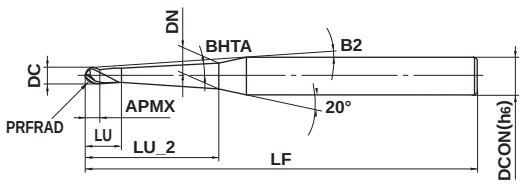
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

VF3XB

Ball nose, 3 flute, Taper neck

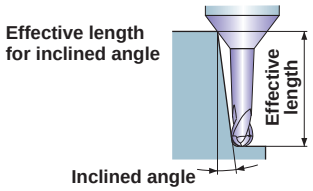
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎	○	○		





Type 1

R	0.4≤PRFRAD≤2.5				
	±0.01				
	0.8≤DC≤5				
	0 - 0.02				
h6	4≤DCON≤6	DCON=8			
	0 - 0.008	0 - 0.009			



● 3 flute ball end mill, high rigidity taper neck type.

Unit : mm

Order Number	PRFRAD	DC	BHTA	APMX	LU_2	LU	B2	DN	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
VF3XBR0040T0024L006	0.4	0.8	0.4°	0.5	6	1.5	8.9°	0.82	60	4	3	★	1	6.3	6.6	6.9	7.3
VF3XBR0040T0024L008	0.4	0.8	0.4°	0.5	8	1.5	7.5°	0.85	60	4	3	★	1	8.4	8.6	9.1	9.5
VF3XBR0040T0024L012	0.4	0.8	0.4°	0.5	12	1.5	5.7°	0.91	60	4	3	★	1	12.4	12.7	13.4	14.1
VF3XBR0040T0054L008	0.4	0.8	0.9°	0.5	8	1.5	7.6°	0.96	60	4	3	★	1	—	8.4	8.9	9.3
VF3XBR0040T0054L012	0.4	0.8	0.9°	0.5	12	1.5	5.8°	1.09	60	4	3	★	1	—	12.4	13.1	13.8
VF3XBR0040T0054L016	0.4	0.8	0.9°	0.5	16	1.5	4.7°	1.22	60	4	3	★	1	—	16.5	17.3	18.3
VF3XBR0050T0024L008	0.5	1	0.4°	0.8	8	2.3	9.6°	1.02	60	6	3	●	1	8.5	8.8	9.3	9.8
VF3XBR0050T0024L010	0.5	1	0.4°	0.8	10	2.3	8.5°	1.05	60	6	3	●	1	10.5	10.9	11.4	12.1
VF3XBR0050T0024L012	0.5	1	0.4°	0.8	12	2.3	7.6°	1.08	60	6	3	●	1	12.6	13.0	13.6	14.4
VF3XBR0050T0024L016	0.5	1	0.4°	0.8	16	2.3	6.3°	1.13	70	6	3	●	1	16.6	17.1	18.0	18.9
VF3XBR0050T0024L020	0.5	1	0.4°	0.8	20	2.3	5.4°	1.19	70	6	3	●	1	20.6	21.2	22.3	23.5
VF3XBR0050T0024L025	0.5	1	0.4°	0.8	25	2.3	4.6°	1.26	70	6	3	★	1	25.7	26.3	27.7	29.3
VF3XBR0050T0024L030	0.5	1	0.4°	0.8	30	2.3	4.0°	1.33	80	6	3	★	1	30.7	31.5	33.1	35.0
VF3XBR0050T0024L035	0.5	1	0.4°	0.8	35	2.3	3.5°	1.40	80	6	3	★	1	35.7	36.6	38.6	40.7
VF3XBR0050T0054L008	0.5	1	0.9°	0.8	8	2.3	9.7°	1.12	60	6	3	●	1	—	8.6	9.1	9.6
VF3XBR0050T0054L012	0.5	1	0.9°	0.8	12	2.3	7.7°	1.24	60	6	3	●	1	—	12.6	13.3	14.1
VF3XBR0050T0054L016	0.5	1	0.9°	0.8	16	2.3	6.4°	1.37	70	6	3	●	1	—	16.7	17.6	18.5
VF3XBR0050T0054L020	0.5	1	0.9°	0.8	20	2.3	5.5°	1.50	70	6	3	●	1	—	20.7	21.8	23.0
VF3XBR0050T0054L025	0.5	1	0.9°	0.8	25	2.3	4.7°	1.65	70	6	3	★	1	—	25.7	27.1	28.6
VF3XBR0050T0054L030	0.5	1	0.9°	0.8	30	2.3	4.0°	1.81	80	6	3	★	1	—	30.8	32.4	34.2
VF3XBR0050T0054L035	0.5	1	0.9°	0.8	35	2.3	3.6°	1.97	80	6	3	★	1	—	35.8	37.7	39.8
VF3XBR0050T0054L040	0.5	1	0.9°	0.8	40	2.3	3.2°	2.12	80	6	3	★	1	—	40.8	43.0	45.4
VF3XBR0050T0054L050	0.5	1	0.9°	0.8	50	2.3	2.7°	2.44	110	6	3	★	1	—	50.9	53.6	⋆
VF3XBR0050T0054L060	0.5	1	0.9°	0.8	60	2.3	2.3°	2.75	110	6	3	★	1	—	60.9	64.1	⋆
VF3XBR0050T0054L070	0.5	1	0.9°	0.8	70	2.3	2.0°	3.07	110	6	3	★	1	—	71.0	74.7	⋆
VF3XBR0050T0130L012	0.5	1	1.5°	0.8	12	2.3	7.9°	1.45	60	6	3	★	1	—	—	13.0	13.7
VF3XBR0050T0130L016	0.5	1	1.5°	0.8	16	2.3	6.5°	1.66	70	6	3	★	1	—	—	17.1	18.0
VF3XBR0050T0130L020	0.5	1	1.5°	0.8	20	2.3	5.6°	1.87	70	6	3	★	1	—	—	21.2	22.4
VF3XBR0050T0130L025	0.5	1	1.5°	0.8	25	2.3	4.8°	2.13	70	6	3	★	1	—	—	26.3	27.8
VF3XBR0050T0130L030	0.5	1	1.5°	0.8	30	2.3	4.1°	2.39	80	6	3	★	1	—	—	31.5	33.2
VF3XBR0050T0130L035	0.5	1	1.5°	0.8	35	2.3	3.7°	2.65	80	6	3	★	1	—	—	36.6	38.6

⋆ No interference

● : Inventory maintained. ★ : Inventory maintained in Japan.

VF3XB

Ball nose, 3 flute, Taper neck

Unit : mm

Order Number	PRFRAD	DC	BHTA	APMX	LU_2	LU	B2	DN	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
														30'	1°	2°	3°
VF3XBR0075T0024L010	0.75	1.5	0.4°	1.3	10	2.8	8.1°	1.54	60	6	3	●	1	10.6	10.9	11.4	12.0
VF3XB**R0075T0024L015**	0.75	1.5	0.4°	1.3	15	2.8	6.2°	1.61	60	6	3	●	1	15.6	16.0	16.9	17.8
VF3XB**R0075T0024L020**	0.75	1.5	0.4°	1.3	20	2.8	5.0°	1.68	70	6	3	●	1	20.6	21.2	22.3	23.5
VF3XB**R0075T0024L030**	0.75	1.5	0.4°	1.3	30	2.8	3.7°	1.82	80	6	3	●	1	30.7	31.5	33.1	35.0
VF3XB**R0075T0054L015**	0.75	1.5	0.9°	1.3	15	2.8	6.3°	1.82	60	6	3	●	1	—	15.7	16.5	17.4
VF3XB**R0075T0054L020**	0.75	1.5	0.9°	1.3	20	2.8	5.1°	1.98	70	6	3	●	1	—	20.7	21.8	23.0
VF3XB**R0075T0054L030**	0.75	1.5	0.9°	1.3	30	2.8	3.7°	2.29	80	6	3	●	1	—	30.8	32.4	34.2
VF3XB**R0075T0054L040**	0.75	1.5	0.9°	1.3	40	2.8	3.0°	2.61	80	6	3	●	1	—	40.8	43.0	45.3
VF3XB**R0075T0130L015**	0.75	1.5	1.5°	1.3	15	2.8	6.4°	2.08	60	6	3	★	1	—	—	16.1	17.0
VF3XB**R0075T0130L020**	0.75	1.5	1.5°	1.3	20	2.8	5.2°	2.34	70	6	3	★	1	—	—	21.2	22.4
VF3XB**R0075T0130L030**	0.75	1.5	1.5°	1.3	30	2.8	3.8°	2.86	80	6	3	★	1	—	—	31.5	33.2
VF3XB**R0100T0024L016**	1	2	0.4°	1.6	16	3.6	5.5°	2.07	70	6	3	●	1	16.7	17.1	18.0	19.0
VF3XB**R0100T0024L020**	1	2	0.4°	1.6	20	3.6	4.6°	2.13	70	6	3	●	1	20.7	21.3	22.3	23.5
VF3XB**R0100T0024L025**	1	2	0.4°	1.6	25	3.6	3.9°	2.20	70	6	3	●	1	25.8	26.4	27.8	29.3
VF3XB**R0100T0024L030**	1	2	0.4°	1.6	30	3.6	3.4°	2.27	80	6	3	●	1	30.8	31.6	33.2	35.0
VF3XB**R0100T0024L035**	1	2	0.4°	1.6	35	3.6	2.9°	2.34	80	6	3	●	1	35.8	36.7	38.6	⋆
VF3XB**R0100T0024L040**	1	2	0.4°	1.6	40	3.6	2.6°	2.41	80	6	3	●	1	40.8	41.9	44.0	⋆
VF3XB**R0100T0054L020**	1	2	0.9°	1.6	20	3.6	4.7°	2.42	70	6	3	●	1	—	20.8	21.9	23.0
VF3XB**R0100T0054L025**	1	2	0.9°	1.6	25	3.6	4.0°	2.57	70	6	3	●	1	—	25.8	27.2	28.6
VF3XB**R0100T0054L030**	1	2	0.9°	1.6	30	3.6	3.4°	2.73	80	6	3	●	1	—	30.9	32.5	34.2
VF3XB**R0100T0054L035**	1	2	0.9°	1.6	35	3.6	3.0°	2.89	80	6	3	●	1	—	35.9	37.7	39.8
VF3XB**R0100T0054L040**	1	2	0.9°	1.6	40	3.6	2.7°	3.04	80	6	3	●	1	—	40.9	43.0	⋆
VF3XB**R0100T0054L050**	1	2	0.9°	1.6	50	3.6	2.2°	3.36	110	6	3	★	1	—	51.0	53.6	⋆
VF3XB**R0100T0054L060**	1	2	0.9°	1.6	60	3.6	1.9°	3.67	110	6	3	★	1	—	61.0	⋆	⋆
VF3XB**R0100T0054L070**	1	2	0.9°	1.6	70	3.6	1.6°	3.99	110	6	3	★	1	—	71.1	⋆	⋆
VF3XB**R0100T0130L025**	1	2	1.5°	1.6	25	3.6	4.1°	3.02	70	6	3	★	1	—	—	26.4	27.9
VF3XB**R0100T0130L030**	1	2	1.5°	1.6	30	3.6	3.5°	3.28	80	6	3	★	1	—	—	31.6	33.3
VF3XB**R0100T0130L035**	1	2	1.5°	1.6	35	3.6	3.1°	3.54	80	6	3	★	1	—	—	36.7	38.7
VF3XB**R0100T0130L040**	1	2	1.5°	1.6	40	3.6	2.7°	3.81	80	6	3	★	1	—	—	41.8	⋆
VF3XB**R0125T0054L020**	1.25	2.5	0.9°	2	20	4.5	4.3°	2.89	60	6	3	★	1	—	20.8	21.9	23.1
VF3XB**R0125T0054L030**	1.25	2.5	0.9°	2	30	4.5	3.1°	3.20	80	6	3	★	1	—	30.9	32.5	34.2
VF3XB**R0125T0054L040**	1.25	2.5	0.9°	2	40	4.5	2.4°	3.52	80	6	3	★	1	—	40.9	43.1	⋆
VF3XB**R0125T0130L020**	1.25	2.5	1.5°	2	20	4.5	4.4°	3.21	60	6	3	★	1	—	—	21.4	22.5
VF3XB**R0125T0130L030**	1.25	2.5	1.5°	2	30	4.5	3.1°	3.74	80	6	3	★	1	—	—	31.6	33.3
VF3XB**R0125T0130L040**	1.25	2.5	1.5°	2	40	4.5	2.5°	4.26	80	6	3	★	1	—	—	41.9	⋆
VF3XB**R0150T0024L020**	1.5	3	0.4°	2	20	5	3.8°	3.11	60	6	3	●	1	20.7	21.3	22.3	23.5
VF3XB**R0150T0024L025**	1.5	3	0.4°	2	25	5	3.1°	3.18	80	6	3	●	1	25.8	26.4	27.7	29.2
VF3XB**R0150T0024L030**	1.5	3	0.4°	2	30	5	2.7°	3.25	80	6	3	●	1	30.8	31.6	33.2	⋆
VF3XB**R0150T0024L040**	1.5	3	0.4°	2	40	5	2.1°	3.39	80	6	3	●	1	40.9	41.9	44.0	⋆
VF3XB**R0150T0024L050**	1.5	3	0.4°	2	50	5	1.7°	3.53	100	6	3	●	1	50.9	52.2	⋆	⋆
VF3XB**R0150T0054L020**	1.5	3	0.9°	2	20	5	3.8°	3.37	60	6	3	●	1	—	20.9	21.9	23.0
VF3XB**R0150T0054L030**	1.5	3	0.9°	2	30	5	2.7°	3.69	80	6	3	●	1	—	30.9	32.5	⋆
VF3XB**R0150T0054L040**	1.5	3	0.9°	2	40	5	2.1°	4.00	80	6	3	●	1	—	41.0	43.1	⋆
VF3XB**R0150T0054L050**	1.5	3	0.9°	2	50	5	1.7°	4.31	100	6	3	●	1	—	51.0	⋆	⋆
VF3XB**R0150T0054L060**	1.5	3	0.9°	2	60	5	2.3°	4.63	110	8	3	●	1	—	61.1	64.2	⋆
VF3XB**R0150T0054L070**	1.5	3	0.9°	2	70	5	2.0°	4.94	120	8	3	●	1	—	71.1	74.8	⋆
VF3XB**R0150T0130L040**	1.5	3	1.5°	2	40	5	2.2°	4.73	80	6	3	★	1	—	—	41.9	⋆
VF3XB**R0150T0130L050**	1.5	3	1.5°	2	50	5	2.8°	5.26	110	8	3	★	1	—	—	52.2	⋆
VF3XB**R0150T0130L060**	1.5	3	1.5°	2	60	5	2.4°	5.78	110	8	3	★	1	—	—	62.4	⋆
VF3XB**R0150T0130L070**	1.5	3	1.5°	2	70	5	2.1°	6.30	120	8	3	★	1	—	—	72.7	⋆
VF3XB**R0200T0054L030**	2	4	0.9°	3	30	6	3.5°	4.65	90	8	3	●	1	—	30.9	32.5	34.2

⋆ No interference

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	PRFRAD	DC	BHTA	APMX	LU_2	LU	B2	DN	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
														30'	1°	2°	3°
VF3XBR0200T0054L040	2	4	0.9°	3	40	6	2.7°	4.97	90	8	3	●	1	—	41.0	43.0	*
VF3XBR0200T0054L050	2	4	0.9°	3	50	6	2.2°	5.28	110	8	3	●	1	—	51.0	53.6	*
VF3XBR0200T0054L060	2	4	0.9°	3	60	6	1.9°	5.60	110	8	3	●	1	—	61.1	*	*
VF3XBR0250T0054L035	2.5	5	0.9°	3.5	35	6.5	2.4°	5.80	90	8	3	●	1	—	35.9	37.7	*
VF3XBR0250T0054L040	2.5	5	0.9°	3.5	40	6.5	2.2°	5.95	90	8	3	●	1	—	41.0	43.0	*
VF3XBR0250T0054L050	2.5	5	0.9°	3.5	50	6.5	1.8°	6.27	110	8	3	●	1	—	51.0	*	*
VF3XBR0250T0054L060	2.5	5	0.9°	3.5	60	6.5	1.5°	6.58	110	8	3	●	1	—	61.1	*	*

* No interference

VF3XB

Ball nose, 3 flute, Taper neck

RECOMMENDED CUTTING CONDITIONS

Work material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.				Hardened steel (45−55HRC) AISI H13 etc.				Hardened steel (55−62HRC) AISI D2 etc.			
PRFRAD (mm)	BHTA	LU_2 (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
R0.4	0.4°	6	34000	2700	106.3	0.03	31000	2200	86.6	0.025	24000	1700	66.9	0.02	19000	1400	55.1	0.015
		8	31000	2100	82.7	0.02	29000	1700	66.9	0.02	22000	1300	51.2	0.015	18000	1000	39.4	0.01
		12	28000	2000	78.7	0.015	26000	1600	63.0	0.01	20000	1200	47.2	0.01	16000	960	37.8	0.007
	0.9°	8	31000	2200	86.6	0.02	29000	1800	70.9	0.02	22000	1400	55.1	0.015	18000	1100	43.3	0.01
		12	28000	2100	82.7	0.015	26000	1700	66.9	0.01	20000	1300	51.2	0.01	16000	1000	39.4	0.007
		16	25000	1100	43.3	0.01	23000	910	35.8	0.01	18000	700	27.6	0.008	14000	560	22.0	0.006
R0.5	0.4°	8	27000	2700	106.3	0.04	25000	2200	86.6	0.04	19000	1700	66.9	0.03	15000	1400	55.1	0.02
		10	24000	2200	86.6	0.03	22000	1800	70.9	0.025	17000	1400	55.1	0.02	14000	1100	43.3	0.015
		12	24000	2200	86.6	0.03	22000	1800	70.9	0.025	17000	1400	55.1	0.02	14000	1100	43.3	0.015
		16	22000	2100	82.7	0.03	21000	1700	66.9	0.025	16000	1300	51.2	0.02	13000	1000	39.4	0.015
		20	20000	1400	55.1	0.015	18000	1200	47.2	0.01	14000	900	35.4	0.01	11000	720	28.3	0.007
		25	18000	1300	51.2	0.015	17000	1000	39.4	0.01	13000	800	31.5	0.009	10000	640	25.2	0.006
		30	15000	960	37.8	0.01	14000	780	30.7	0.01	11000	600	23.6	0.008	8800	480	18.9	0.006
		35	14000	800	31.5	0.008	13000	650	25.6	0.007	10000	500	19.7	0.006	8000	400	15.7	0.004
	0.9°	8	27000	2900	114.2	0.04	25000	2300	90.6	0.04	19000	1800	70.9	0.03	15000	1400	55.1	0.02
		12	24000	2400	94.5	0.03	22000	2000	78.7	0.025	17000	1500	59.1	0.02	14000	1200	47.2	0.015
		16	22000	2200	86.6	0.03	21000	1800	70.9	0.025	16000	1400	55.1	0.02	13000	1100	43.3	0.015
		20	20000	1600	63.0	0.015	18000	1300	51.2	0.01	14000	1000	39.4	0.01	11000	800	31.5	0.007
		25	18000	1400	55.1	0.015	17000	1200	47.2	0.01	13000	900	35.4	0.009	10000	720	28.3	0.006
		30	15000	1100	43.3	0.01	14000	910	35.8	0.009	11000	700	27.6	0.008	8800	560	22.0	0.006
		35	14000	960	37.8	0.008	13000	780	30.7	0.007	10000	600	23.6	0.006	8000	480	18.9	0.004
		40	11000	800	31.5	0.007	11000	650	25.6	0.006	8000	500	19.7	0.005	6400	400	15.7	0.003
		50	8400	610	24.0	0.006	7800	490	19.3	0.005	6000	380	15.0	0.004	4800	300	11.8	0.003
		60	7000	510	20.1	0.004	6500	400	15.7	0.004	5000	320	12.6	0.003	4000	260	10.2	0.002
		70	7000	480	18.9	0.003	6500	390	15.4	0.002	5000	300	11.8	0.002	4000	240	9.4	0.001
	1.5°	12	24000	2600	102.4	0.03	22000	2100	82.7	0.025	17000	1600	63.0	0.02	14000	1300	51.2	0.015
		16	22000	2400	94.5	0.03	21000	2000	78.7	0.025	16000	1500	59.1	0.02	13000	1200	47.2	0.015
		20	20000	1800	70.9	0.015	18000	1400	55.1	0.01	14000	1100	43.3	0.01	11000	880	34.6	0.007
		25	18000	1600	63.0	0.015	17000	1300	51.2	0.01	13000	1000	39.4	0.009	11000	800	31.5	0.006
		30	15000	1300	51.2	0.01	14000	1000	39.4	0.01	11000	800	31.5	0.008	8800	640	25.2	0.006
		35	14000	1100	43.3	0.008	13000	910	35.8	0.007	10000	700	27.6	0.006	8000	560	22.0	0.004
R0.75	0.4°	10	18000	2700	106.3	0.06	17000	2200	86.6	0.05	13000	1700	66.9	0.04	10000	1400	55.1	0.03
		15	17000	2200	86.6	0.04	16000	1800	70.9	0.04	12000	1400	55.1	0.03	9600	1100	43.3	0.02
		20	17000	2100	82.7	0.03	16000	1700	66.9	0.025	12000	1300	51.2	0.02	9600	1000	39.4	0.015
		30	14000	1600	63.0	0.015	13000	1300	51.2	0.01	10000	1000	39.4	0.01	8000	800	31.5	0.007
	0.9°	15	17000	2400	94.5	0.04	16000	2000	78.7	0.04	12000	1500	59.1	0.03	9600	1200	47.2	0.02
		20	17000	2200	86.6	0.03	16000	1800	70.9	0.025	12000	1400	55.1	0.02	9600	1100	43.3	0.015
		30	14000	1800	70.9	0.015	13000	1400	55.1	0.01	10000	1100	43.3	0.01	8000	880	34.6	0.007
		40	13000	1300	51.2	0.01	12000	1000	39.4	0.01	9000	800	31.5	0.008	7200	640	25.2	0.006
	1.5°	15	17000	2600	102.4	0.04	16000	2100	82.7	0.04	12000	1600	63.0	0.03	9600	1300	51.2	0.02
		20	17000	2400	94.5	0.03	16000	2000	78.7	0.025	12000	1500	59.1	0.02	9600	1200	47.2	0.015
		30	14000	2000	78.7	0.015	13000	1600	63.0	0.01	10000	1200	47.2	0.01	8000	960	37.8	0.007

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

Work material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.				Hardened steel (45−55HRC) AISI H13 etc.				Hardened steel (55−62HRC) AISI D2 etc.			
PRFRAD (mm)	**BHTA**	**LU_2** (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
R1	0.4°	16	15000	3200	126.0	0.07	14000	2600	102.4	0.06	11000	2000	78.7	0.05	8800	1600	63.0	0.03
		20	14000	2400	94.5	0.06	13000	2000	78.7	0.05	10000	1500	59.1	0.04	8000	1200	47.2	0.03
		25	14000	2100	82.7	0.04	13000	1700	66.9	0.04	10000	1300	51.2	0.03	8000	1000	39.4	0.02
		30	13000	1800	70.9	0.03	12000	1400	55.1	0.03	9000	1100	43.3	0.025	7200	880	34.6	0.02
		35	13000	1600	63.0	0.03	12000	1300	51.2	0.025	9000	1000	39.4	0.02	7200	800	31.5	0.015
		40	12000	1400	55.1	0.015	11000	1200	47.2	0.01	8500	900	35.4	0.01	6800	720	28.3	0.007
	0.9°	20	14000	2600	102.4	0.06	13000	2100	82.7	0.05	10000	1600	63.0	0.04	8000	1300	51.2	0.03
		25	14000	2200	86.6	0.05	13000	1800	70.9	0.04	10000	1400	55.1	0.03	8000	1100	43.3	0.025
		30	13000	1900	74.8	0.04	12000	1600	63.0	0.04	9000	1200	47.2	0.03	7200	960	37.8	0.02
		35	13000	1800	70.9	0.04	12000	1400	55.1	0.03	9000	1100	43.3	0.025	7200	880	34.6	0.02
		40	12000	1600	63.0	0.03	11000	1300	51.2	0.025	8500	1000	39.4	0.02	6800	800	31.5	0.015
		50	11000	1400	55.1	0.015	10000	1200	47.2	0.01	8000	900	35.4	0.01	6400	720	28.3	0.007
		60	9800	1100	43.3	0.007	9100	910	35.8	0.006	7000	700	27.6	0.005	5600	560	22.0	0.003
		70	8400	960	37.8	0.004	7800	780	30.7	0.004	6000	600	23.6	0.003	4800	480	18.9	0.002
	1.5°	25	14000	2400	94.5	0.05	13000	2000	78.7	0.04	10000	1500	59.1	0.03	8000	1200	47.2	0.025
		30	12600	2100	82.7	0.04	12000	1700	66.9	0.04	9000	1300	51.2	0.03	7200	1000	39.4	0.02
		35	13000	1900	74.8	0.04	12000	1600	63.0	0.03	9000	1200	47.2	0.025	7200	960	37.8	0.02
		40	12000	1800	70.9	0.03	11000	1400	55.1	0.025	8500	1100	43.3	0.02	6800	880	34.6	0.015
R1.25	0.9°	20	13000	2900	114.2	0.06	12000	2300	90.6	0.05	9000	1800	70.9	0.04	7200	1400	55.1	0.03
		30	12000	2600	102.4	0.05	11000	2100	82.7	0.04	8500	1600	63.0	0.03	6800	1300	51.2	0.025
		40	11000	2200	86.6	0.04	9800	1800	70.9	0.04	7500	1400	55.1	0.03	6000	1100	43.3	0.02
	1.5°	20	13000	3000	118.1	0.06	12000	2500	98.4	0.05	9000	1900	74.8	0.04	7200	1500	59.1	0.03
		30	12000	2700	106.3	0.05	11050	2200	86.6	0.04	8500	1700	66.9	0.03	6800	1400	55.1	0.025
		40	11000	2400	94.5	0.04	9800	2000	78.7	0.04	7500	1500	59.1	0.03	6000	1200	47.2	0.02
R1.5	0.4°	20	12000	3700	145.7	0.13	11000	3000	118.1	0.1	8500	2300	90.6	0.09	6800	1800	70.9	0.06
		30	11000	2900	114.2	0.07	10000	2300	90.6	0.06	8000	1800	70.9	0.05	6400	1400	55.1	0.03
		40	11000	2400	94.5	0.06	10000	2000	78.7	0.05	8000	1500	59.1	0.04	6400	1200	47.2	0.03
		50	11000	2000	78.7	0.04	9800	1600	63.0	0.04	7500	1200	47.2	0.03	6000	960	37.8	0.02
	0.9°	20	12000	3800	149.6	0.13	11000	3100	122.0	0.1	8500	2400	94.5	0.09	6800	1900	74.8	0.06
		30	11000	3000	118.1	0.07	10000	2500	98.4	0.06	8000	1900	74.8	0.05	6400	1500	59.1	0.03
		40	11000	2600	102.4	0.06	10000	2100	82.7	0.05	8000	1600	63.0	0.04	6400	1300	51.2	0.03
		50	11000	2100	82.7	0.04	9800	1700	66.9	0.04	7500	1300	51.2	0.03	6000	1000	39.4	0.02
		60	9800	2000	78.7	0.03	9100	1600	63.0	0.025	7000	1200	47.2	0.02	5600	960	37.8	0.015
		70	9800	1800	70.9	0.015	9100	1400	55.1	0.01	7000	1100	43.3	0.01	5600	880	34.6	0.007
	1.5°	50	11000	2200	86.6	0.04	9800	1800	70.9	0.04	7500	1400	55.1	0.03	6000	1100	43.3	0.02
		60	9800	2100	82.7	0.03	9100	1700	66.9	0.025	7000	1300	51.2	0.02	5600	1000	39.4	0.015
		70	9800	2000	78.7	0.015	9100	1600	63.0	0.01	7000	1200	47.2	0.01	5600	960	37.8	0.007
R2	0.9°	30	10000	3200	126.0	0.3	9400	2600	102.4	0.25	7200	2000	78.7	0.2	5800	1600	63.0	0.15
		40	9500	2400	94.5	0.15	8800	2000	78.7	0.12	6800	1500	59.1	0.1	5400	1200	47.2	0.07
		50	9500	2100	82.7	0.1	8800	1700	66.9	0.1	6800	1300	51.2	0.08	5400	1000	39.4	0.06
		60	9000	1900	74.8	0.07	8300	1600	63.0	0.06	6400	1200	47.2	0.05	5100	960	37.8	0.03
R2.5	0.9°	35	8000	3500	137.8	0.3	7400	2900	114.2	0.25	5700	2200	86.6	0.2	4600	1800	70.9	0.15
		40	8000	3200	126.0	0.2	7400	2600	102.4	0.18	5700	2000	78.7	0.15	4600	1600	63.0	0.1
		60	7600	2400	94.5	0.15	7000	2000	78.7	0.12	5400	1500	59.1	0.1	4300	1200	47.2	0.07

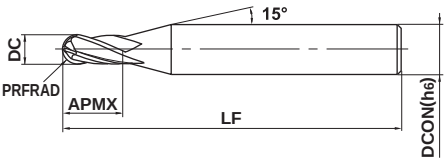
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VF4MB

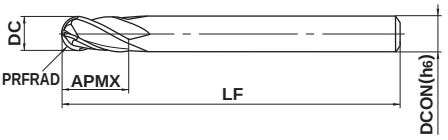
Ball nose, Medium cut length, 4 flute

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	◎	◎	◎	○	○		





Type1



Type2

R				
0.5≤PRFRAD≤6				
±0.01				
1≤DC≤12				
0 - 0.020				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

● 4 flute ball nose end mill for high-speed machining of hardened steel.

Unit : mm

Order Number	PRFRAD	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF4MBR0050	0.5	1	2.5	50	6	4	●	1
VF4MB**R0100**	1	2	6	60	6	4	●	1
VF4MB**R0150**	1.5	3	8	70	6	4	●	1
VF4MB**R0200**	2	4	8	70	6	4	●	1
VF4MB**R0250**	2.5	5	12	80	6	4	●	1
VF4MB**R0300**	3	6	12	80	6	4	●	2
VF4MB**R0400**	4	8	14	90	8	4	●	2
VF4MB**R0500**	5	10	18	100	10	4	●	2
VF4MB**R0600**	6	12	22	110	12	4	●	2

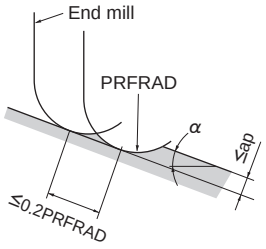
● : Inventory maintained.

RECOMMENDED CUTTING CONDITIONS

Work material	Hardened steel (45—55HRC) AISI H13 etc.							Hardened steel (55—62HRC) AISI D2 etc.						
PRFRAD (mm)	α≤15°			α>15°			Depth of cut ap (mm)	α≤15°			α>15°			Depth of cut ap (mm)
	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed			Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		
		(mm/min)	(IPM)		(mm/min)	(IPM)			(mm/min)	(IPM)		(mm/min)	(IPM)	
R0.5	40000	8000	315.0	40000	3800	149.6	0.06	40000	5600	220.5	40000	3100	122.0	0.05
R1	40000	9600	378.0	40000	5600	220.5	0.11	40000	8000	315.0	28000	3100	122.0	0.10
R1.5	40000	12000	472.4	32000	5600	220.5	0.13	32000	7700	303.1	19000	2900	114.2	0.12
R2	32000	11000	433.1	24000	4700	185.0	0.15	24000	6200	244.1	14000	2500	98.4	0.13
R2.5	25000	9000	354.3	19000	3800	149.6	0.20	19000	5300	208.7	12000	2200	86.6	0.15
R3	21000	8400	330.7	15000	3400	133.9	0.25	16000	4800	189.0	9600	2000	78.7	0.20
R4	16000	6400	252.0	12000	2600	102.4	0.30	12000	3600	141.7	7200	1600	63.0	0.20
R5	13000	5200	204.7	9600	2200	86.6	0.50	10000	3200	126.0	5800	1300	51.2	0.20
R6	9000	3600	141.7	7200	1700	66.9	0.50	7000	2200	86.6	4300	940	37.0	0.30
Depth of cut	≤0.2PRFRAD, ap													

Work material	Hardened steel (62—70HRC) AISI W1, AISI M2 etc.						
PRFRAD (mm)	α≤15°			α>15°			Depth of cut ap (mm)
	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		
		(mm/min)	(IPM)		(mm/min)	(IPM)	
R0.5	40000	4700	185.0	32000	1700	66.9	0.03
R1	24000	5000	196.9	16000	1200	47.2	0.06
R1.5	16000	4200	165.4	11000	1100	43.3	0.07
R2	12000	3100	122.0	8000	1000	39.4	0.08
R2.5	9600	2700	106.3	6000	780	30.7	0.08
R3	8000	2300	90.6	5000	780	30.7	0.09
R4	6000	1900	74.8	4000	620	24.4	0.09
R5	4800	1500	59.1	3000	550	21.7	0.10
R6	3600	1100	43.3	2200	400	15.7	0.10
Depth of cut	≤0.2PRFRAD, ap						

1) α is the inclination of the machined surface.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

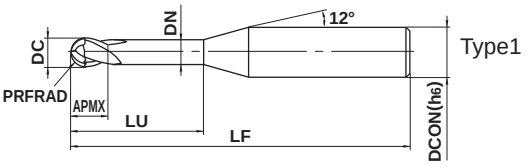


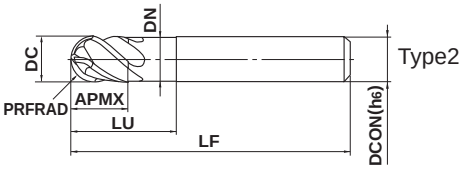
VF4SVB

Ball nose, Short cut length, 4 flute, Variable curve

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		







R

PRFRAD≤6	PRFRAD>6			
±0.01	±0.02			

DC

DC≤12	DC>12			
0 - 0.02	0 - 0.03			

h6

DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

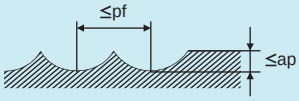
● Impact Miracle ball nose end mill with variable curve ensures stable machining of difficult-to-cut materials.

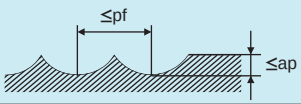
Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VF4SVBR0100	1	2	3	5	1.9	50	6	4	●	1
VF4SVB**R0150**	1.5	3	4.5	7.5	2.9	50	6	4	●	1
VF4SVB**R0200**	2	4	6	10	3.9	50	6	4	●	1
VF4SVB**R0250**	2.5	5	7.5	12.5	4.9	50	6	4	●	1
VF4SVB**R0300**	3	6	9	15	5.85	50	6	4	●	2
VF4SVB**R0400**	4	8	12	20	7.85	60	8	4	★	2
VF4SVB**R0500**	5	10	15	25	9.7	70	10	4	★	2
VF4SVB**R0600**	6	12	18	30	11.7	75	12	4	★	2
VF4SVB**R0800**	8	16	24	40	15.5	90	16	4	★	2
VF4SVB**R1000**	10	20	30	50	19.5	100	20	4	★	2

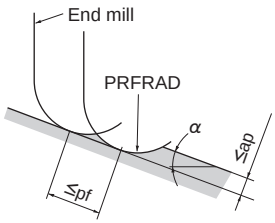
● : Inventory maintained. ★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Work material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1—10, AISI P21 etc.								Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti—6Al—4V etc.							
PRFRAD (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Pick feed pf (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Pick feed pf (mm)
	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)			Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)		
R 1	40000	8000	315.0	32000	3800	149.6	0.17	0.5	36000	6500	255.9	24000	2900	114.2	0.17	0.5
R 1.5	32000	7700	303.1	21000	3200	126.0	0.25	0.75	24000	4800	189.0	16000	1900	74.8	0.25	0.75
R 2	24000	5800	228.3	16000	2800	110.2	0.33	1	18000	4000	157.5	12000	1700	66.9	0.33	1
R 2.5	19000	5300	208.7	12700	2600	102.4	0.42	1.25	14400	3500	137.8	9600	1500	59.1	0.42	1.25
R 3	16000	4800	189.0	10600	2100	82.7	0.5	1.5	12000	3200	126.0	8000	1400	55.1	0.5	1.5
R 4	12000	4300	169.3	8000	1900	74.8	0.8	2	9000	3200	126.0	6000	1400	55.1	0.8	2
R 5	9600	4100	161.4	6400	1800	70.9	1	2.5	7200	3000	118.1	4800	1300	51.2	1	2.5
R 6	8000	4000	157.5	5300	1800	70.9	1.2	3	6000	3000	118.1	4000	1300	51.2	1.2	3
R 8	6000	3200	126.0	4000	1400	55.1	1.6	4	4500	2500	98.4	3000	1100	43.3	1.6	4
R10	4800	3000	118.1	3200	1300	51.2	2	5	3600	2300	90.6	2400	1000	39.4	2	5
Depth of cut																

Work material	Heat resistant alloy Inconel718 etc.							
PRFRAD (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Pick feed pf (mm)
	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)		
R 1	9600	960	37.8	6400	510	20.1	0.17	0.2
R 1.5	6400	640	25.2	4200	340	13.4	0.25	0.3
R 2	4800	580	22.8	3200	260	10.2	0.33	0.4
R 2.5	3800	530	20.9	2500	250	9.8	0.42	0.5
R 3	3200	500	19.7	2100	210	8.3	0.25	0.6
R 4	2400	430	16.9	1600	190	7.5	0.4	0.8
R 5	2000	420	16.5	1300	180	7.1	0.5	1
R 6	1700	350	13.8	1100	150	5.9	0.6	1.2
R 8	1200	300	11.8	800	130	5.1	0.8	1.6
R10	1000	250	9.8	640	100	3.9	1	2
Depth of cut								

1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
2) If the depth of cut is shallow, the revolution and feed rate can be increased.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.
4) α is the inclination angle of the machined surface.



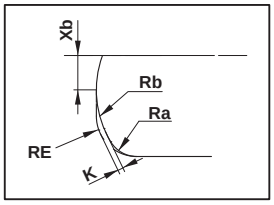
VFFDRB NEW

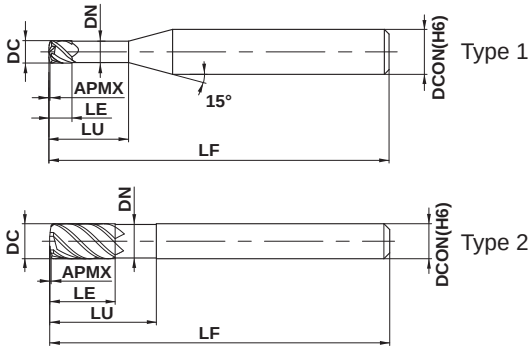
Multi-task corner radius end mill for impact miracle high speed cutting

UWC VF 40° DC≤6 DC≤8

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○	◎	◎				







DC≤12				
0 - 0.020				
DMM=6	8≤DMM≤10	DMM=12		
0 - 0.008	0 - 0.009	0 - 0.011		

h6

- Multi-task corner radius type allows more efficient high feed.
- Adoption of multiple cuttings realized high feed cutting.

Unit : mm

Order Number	DC	RE	APMX	LE	LU	DN	LF	DCON	No. of Flutes	Multi-task radius part				RMPX	Stock	Type
										K	Xb	Ra	Rb			
VFFDRBD0300	3	0.64	0.18	3	10	2.8	60	6	4	0.08	0.375	0.5	2	2.1°	●	1
VFFDRBD**0400**	4	0.71	0.25	4	12	3.8	60	6	4	0.13	0.5	0.5	3	1.9°	●	1
VFFDRBD**0600**	6	0.92	0.36	9	18	5.6	80	6	4	0.21	0.75	0.6	5	1.7°	●	2
VFFDRBD**0800**	8	1.16	0.44	12	24	7.6	90	8	6	0.22	1.6	0.8	4.5	1.7°	●	2
VFFDRBD**1000**	10	1.47	0.57	15	30	9.4	100	10	6	0.28	2	1	5.5	1.7°	●	2
VFFDRBD**1200**	12	1.77	0.7	18	36	11.4	110	12	6	0.34	2.4	1.2	6.5	1.8°	●	2

RECOMMENDED CUTTING CONDITIONS

Work material	Carbon steel, Alloy steel (180—280HB), Tool steel (≤350HB) Mild steel (≤180HB) S45C, SCM440, SS400, S10C etc.							Pre-hardened steel (35—45HRC) NAK, PX5, SNCM439, SKD, SKT etc.						
DC (mm)	Cutting Speed (m/min)	Main spindle speed (min⁻¹)	Feed per Tooth (mm/tooth)	Table Feed (mm/min)	Table Feed (IPM)	Depth of Cut ap (mm)	Width of Cut ae (mm)	Cutting Speed (m/min)	Main spindle speed (min⁻¹)	Feed per Tooth (mm/tooth)	Table Feed (mm/min)	Table Feed (IPM)	Depth of Cut ap (mm)	Width of Cut ae (mm)
3	150	16000	0.15	9600	378	0.12	1.5	135	14000	0.15	8400	330	0.12	1.5
4	150	12000	0.20	9600	378	0.16	2.0	135	11000	0.20	8800	346	0.16	2.0
6	150	8000	0.35	11000	433	0.24	3.0	135	7200	0.35	10000	394	0.24	3.0
8	150	6000	0.35	13000	512	0.32	4.8	135	5400	0.35	11000	433	0.32	4.8
10	150	4800	0.40	12000	472	0.40	6.0	135	4300	0.40	10000	393	0.40	6.0
12	150	4000	0.45	11000	433	0.48	7.2	135	3600	0.45	9700	382	0.48	7.2

Work material	Hardened steel (40—55HRC), Ferritic and martensitic stainless steel (>200HB), Precipitation hardening stainless steel (<450HB) SKD61, SKT4, SUS431, SUS420J2, STAVAX, SUS630, SUS631, 15-5PH, 17-4PH etc.							Hardened steel (55—62HRC) SKD11 etc.						
DC (mm)	Cutting Speed (m/min)	Main spindle speed (min⁻¹)	Feed per Tooth (mm/tooth)	Table Feed (mm/min)	Table Feed (IPM)	Depth of Cut ap (mm)	Width of Cut ae (mm)	Cutting Speed (m/min)	Main spindle speed (min⁻¹)	Feed per Tooth (mm/tooth)	Table Feed (mm/min)	Table Feed (IPM)	Depth of Cut ap (mm)	Width of Cut ae (mm)
3	120	13000	0.15	7800	308	0.12	1.5	80	8500	0.10	3400	134	0.12	1.5
4	120	9500	0.21	8000	315	0.16	2.0	80	6400	0.15	3800	150	0.16	2.0
6	120	6400	0.35	9000	354	0.24	3.0	80	4200	0.30	5000	197	0.24	3.0
8	120	4800	0.35	10000	394	0.32	4.8	80	3200	0.30	5800	228	0.32	4.8
10	120	3800	0.40	9100	358	0.40	6.0	80	2500	0.35	5300	209	0.40	6.0
12	120	3200	0.45	8600	339	0.48	7.2	80	2100	0.40	5000	197	0.48	7.2

1) When ramping process set the feedrate at 50%. A ramping angle of 1° is recommended.
2) Use at a revolution of 70% and feedrate of 50% when the tool overhang exceeds 5D.

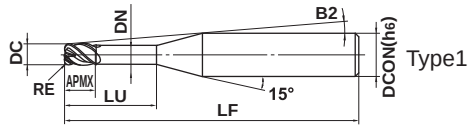
● : Inventory maintained.

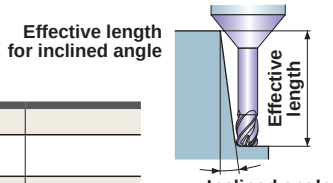
VFHVRB

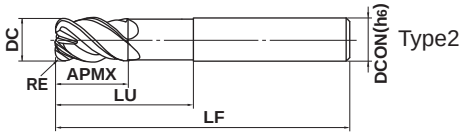
4 flute, Corner radius, Short cut length, Irregular helix flutes

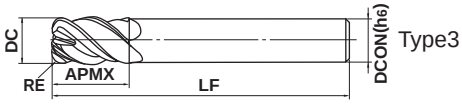
Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎	◎	○	○		











R	DC≤10	DC>10			
	±0.007	±0.01			
	DC≤12	DC>12			
	0 - 0.02	0 - 0.03			
h6	DCON=6	8≤DCON≤10	12≤DCON≤16		
	0 - 0.008	0 - 0.009	0 - 0.011		

● Impact Miracle corner radius end mill for high feed and efficient machining.

Unit : mm

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
VFHVRBD0100R02N004	1	0.2	1	4	0.94	10.6°	60	6	4	●	1	4.2	4.5	4.7	5.3
VFHVRB**D0100R02N006**	1	0.2	1	6	0.94	9.2°	60	6	4	●	1	6.4	6.7	7.2	7.7
VFHVRB**D0100R02N008**	1	0.2	1	8	0.94	8.2°	60	6	4	●	1	8.5	8.8	9.5	10.2
VFHVRB**D0100R02N010**	1	0.2	1	10	0.94	7.4°	60	6	4	●	1	10.5	11	11.8	12.7
VFHVRB**D0100R02N015**	1	0.2	1	15	0.94	5.9°	60	6	4	●	1	15.8	16.3	17.5	18.9
VFHVRB**D0100R02N020**	1	0.2	1	20	0.94	4.9°	80	6	4	●	1	20.9	21.7	23.3	25.1
VFHVRB**D0150R03N004**	1.5	0.3	1.5	4	1.44	10.3°	60	6	4	●	1	4.2	4.5	4.6	5.2
VFHVRB**D0150R03N006**	1.5	0.3	1.5	6	1.44	8.9°	60	6	4	●	1	6.3	6.6	7.2	7.7
VFHVRB**D0150R03N010**	1.5	0.3	1.5	10	1.44	7°	60	6	4	●	1	10.5	10.9	11.8	12.7
VFHVRB**D0150R03N015**	1.5	0.3	1.5	15	1.44	5.5°	60	6	4	●	1	15.7	16.3	17.5	18.9
VFHVRB**D0150R03N020**	1.5	0.3	1.5	20	1.44	4.6°	80	6	4	●	1	20.9	21.6	23.3	25.1
VFHVRB**D0150R03N025**	1.5	0.3	1.5	25	1.44	3.9°	80	6	4	●	1	26.1	27	29	31.3
VFHVRB**D0150R03N030**	1.5	0.3	1.5	30	1.44	3.4°	80	6	4	●	1	31.3	32.3	34.7	37.5
VFHVRB**D0200R05N006**	2	0.5	2	6	1.9	8.7°	60	6	4	●	1	6.3	6.5	7	7.5
VFHVRB**D0200R05N010**	2	0.5	2	10	1.9	6.7°	60	6	4	●	1	10.5	10.8	11.6	12.5
VFHVRB**D0200R05N015**	2	0.5	2	15	1.9	5.2°	60	6	4	●	1	15.6	16.2	17.4	18.7
VFHVRB**D0200R05N020**	2	0.5	2	20	1.9	4.3°	80	6	4	●	1	20.8	21.5	23.1	24.9
VFHVRB**D0200R05N025**	2	0.5	2	25	1.9	3.6°	80	6	4	●	1	26	26.9	28.9	31.2
VFHVRB**D0200R05N030**	2	0.5	2	30	1.9	3.1°	80	6	4	●	1	31.2	32.2	34.6	37.4
VFHVRB**D0200R05N035**	2	0.5	2	35	1.9	2.8°	90	6	4	●	1	36.3	37.6	40.4	*
VFHVRB**D0200R05N040**	2	0.5	2	40	1.9	2.5°	90	6	4	●	1	41.5	42.9	46.1	*
VFHVRB**D0300R05N010**	3	0.5	3	10	2.9	5.6°	60	6	4	●	1	10.5	10.8	11.6	12.5
VFHVRB**D0300R05N015**	3	0.5	3	15	2.9	4.3°	60	6	4	●	1	15.6	16.2	17.4	18.7
VFHVRB**D0300R05N020**	3	0.5	3	20	2.9	3.4°	80	6	4	●	1	20.8	21.5	23.1	24.9
VFHVRB**D0300R05N030**	3	0.5	3	30	2.9	2.5°	80	6	4	●	1	31.2	32.2	34.6	*
VFHVRB**D0300R08N010**	3	0.8	3	10	2.9	5.7°	60	6	4	●	1	10.4	10.8	11.6	12.4
VFHVRB**D0300R08N015**	3	0.8	3	15	2.9	4.3°	60	6	4	●	1	15.6	16.2	17.3	18.7
VFHVRB**D0300R08N020**	3	0.8	3	20	2.9	3.5°	80	6	4	●	1	20.8	21.5	23.1	24.9
VFHVRB**D0300R08N030**	3	0.8	3	30	2.9	2.5°	80	6	4	●	1	31.1	32.2	34.6	*
VFHVRB**D0300R08N040**	3	0.8	3	40	2.9	2°	90	6	4	●	1	41.5	42.9	*	*
VFHVRB**D0300R08N050**	3	0.8	3	50	2.9	1.6°	90	6	4	●	1	51.8	53.6	*	*
VFHVRB**D0400R05N012**	4	0.5	4	12	3.9	3.8°	60	6	4	●	1	12.5	13	13.9	15

* No interference

VFHVRB

4 flute, Corner radius, Short cut length, Irregular helix flutes

Unit : mm

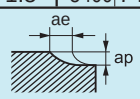
Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												30'	1°	2°	3°
VFHVRBD0400R05N020	4	0.5	4	20	3.9	2.5°	80	6	4	●	1	20.8	21.5	23.1	⁎
VFHVRBD0400R05N030	4	0.5	4	30	3.9	1.8°	80	6	4	●	1	31.2	32.2	⁎	⁎
VFHVRBD0400R05N048	4	0.5	4	48	3.9	1.2°	90	6	4	●	1	49.8	51.5	⁎	⁎
VFHVRBD0400R10N012	4	1	4	12	3.9	3.9°	60	6	4	●	1	12.5	12.9	13.8	14.9
VFHVRBD0400R10N020	4	1	4	20	3.9	2.5°	80	6	4	●	1	20.8	21.5	23	⁎
VFHVRBD0400R10N030	4	1	4	30	3.9	1.8°	80	6	4	●	1	31.1	32.2	⁎	⁎
VFHVRBD0600R05N018	6	0.5	9	18	5.85	—	60	6	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0600R05N030	6	0.5	9	30	5.85	—	80	6	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0600R10N018	6	1	9	18	5.85	—	60	6	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0600R10N030	6	1	9	30	5.85	—	80	6	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0600R10N054	6	1	9	54	5.85	—	90	6	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0600R15N018	6	1.5	9	18	5.85	—	60	6	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0600R15N030	6	1.5	9	30	5.85	—	80	6	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0600R15N042	6	1.5	9	42	5.85	—	90	6	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0600R15N054	6	1.5	9	54	5.85	—	90	6	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0600R20N018	6	2	9	18	5.85	—	60	6	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0600R20N030	6	2	9	30	5.85	—	80	6	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0700R15	7	1.5	11	—	—	—	80	6	4	●	3	⁎	⁎	⁎	⁎
VFHVRBD0800R05N024	8	0.5	12	24	7.85	—	60	8	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0800R05N040	8	0.5	12	40	7.85	—	100	8	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0800R10N024	8	1	12	24	7.85	—	60	8	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0800R10N040	8	1	12	40	7.85	—	100	8	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0800R20N024	8	2	12	24	7.85	—	60	8	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0800R20N040	8	2	12	40	7.85	—	100	8	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0800R20N056	8	2	12	56	7.85	—	120	8	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0800R20N072	8	2	12	72	7.85	—	120	8	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD0900R20	9	2	13.5	—	—	—	100	8	4	●	3	⁎	⁎	⁎	⁎
VFHVRBD1000R05N030	10	0.5	15	30	9.7	—	70	10	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1000R05N050	10	0.5	15	50	9.7	—	110	10	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1000R10N030	10	1	15	30	9.7	—	70	10	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1000R10N050	10	1	15	50	9.7	—	110	10	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1000R20N030	10	2	15	30	9.7	—	70	10	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1000R20N050	10	2	15	50	9.7	—	110	10	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1000R20N070	10	2	15	70	9.7	—	150	10	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1000R20N090	10	2	15	90	9.7	—	150	10	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1100R20	11	2	16.5	—	—	—	110	10	4	●	3	⁎	⁎	⁎	⁎
VFHVRBD1200R05N036	12	0.5	18	36	11.7	—	80	12	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1200R05N060	12	0.5	18	60	11.7	—	120	12	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1200R10N036	12	1	18	36	11.7	—	80	12	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1200R10N060	12	1	18	60	11.7	—	120	12	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1200R20N036	12	2	18	36	11.7	—	80	12	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1200R20N060	12	2	18	60	11.7	—	120	12	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1200R20N084	12	2	18	84	11.7	—	160	12	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1200R20N108	12	2	18	108	11.7	—	160	12	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1200R30N036	12	3	18	36	11.7	—	80	12	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1200R30N060	12	3	18	60	11.7	—	120	12	4	●	2	⁎	⁎	⁎	⁎
VFHVRBD1300R30	13	3	19.5	—	—	—	120	12	4	★	3	⁎	⁎	⁎	⁎
VFHVRBD1600R05N042	16	0.5	24	42	15.5	—	100	16	4	★	2	⁎	⁎	⁎	⁎
VFHVRBD1600R20N042	16	2	24	42	15.5	—	100	16	4	★	2	⁎	⁎	⁎	⁎
VFHVRBD1600R30N042	16	3	24	42	15.5	—	100	16	4	★	2	⁎	⁎	⁎	⁎
VFHVRBD1600R30N080	16	3	24	80	15.5	—	140	16	4	★	2	⁎	⁎	⁎	⁎
VFHVRBD1600R30N120	16	3	24	120	15.5	—	175	16	4	★	2	⁎	⁎	⁎	⁎

⁎ No interference

● : Inventory maintained. ★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

High feed conditions

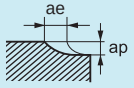
Work material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.					Hardened steel (45−55HRC) AISI H13 etc.					Hardened steel (55−62HRC) AISI D2 etc.				
DC (mm)	RE (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
1	0.2	4	40000	7200	283.5	0.04	0.45	33000	5100	200.8	0.03	0.45	27000	4100	161.4	0.025	0.45	20000	1800	70.9	0.013	0.45
1	0.2	6	40000	6500	255.9	0.03	0.45	33000	4600	181.1	0.022	0.45	27000	3700	145.7	0.018	0.45	20000	1600	63.0	0.01	0.45
1	0.2	8	32000	4500	177.2	0.022	0.45	27000	3200	126.0	0.018	0.45	21000	2600	102.4	0.012	0.45	16000	1100	43.3	0.008	0.45
1	0.2	10	24000	2700	106.3	0.015	0.45	20000	1900	74.8	0.01	0.45	16000	1500	59.1	0.008	0.45	12000	700	27.6	0.006	0.45
1	0.2	15	16000	1200	47.2	0.008	0.45	14000	700	27.6	0.005	0.45	12000	500	19.7	0.003	0.45	10000	400	15.7	0.003	0.45
1	0.2	20	14000	1000	39.4	0.005	0.45	12000	600	23.6	0.004	0.45	10000	400	15.7	0.002	0.45	9000	300	11.8	0.002	0.45
1.5	0.3	4	32000	10000	393.7	0.1	0.65	27000	7100	279.5	0.08	0.65	21000	5700	224.4	0.06	0.65	16000	2500	98.4	0.03	0.65
1.5	0.3	6	32000	7800	307.1	0.08	0.65	27000	5500	216.5	0.06	0.65	21000	4200	165.4	0.05	0.65	16000	2000	78.7	0.025	0.65
1.5	0.3	10	27000	5700	224.4	0.05	0.65	22000	4000	157.5	0.035	0.65	18000	3000	118.1	0.03	0.65	14000	1400	55.1	0.014	0.65
1.5	0.3	15	22000	3200	126.0	0.03	0.65	18000	2300	90.6	0.025	0.65	15000	1700	66.9	0.018	0.65	11000	1000	39.4	0.009	0.65
1.5	0.3	20	16000	1400	55.1	0.02	0.65	14000	1200	47.2	0.016	0.65	13000	1000	39.4	0.012	0.65	9000	700	27.6	0.007	0.65
1.5	0.3	25	13000	1000	39.4	0.015	0.65	11000	800	31.5	0.012	0.65	10000	700	27.6	0.009	0.65	7500	500	19.7	0.005	0.65
1.5	0.3	30	13000	900	35.4	0.01	0.65	11000	700	27.6	0.008	0.65	10000	600	23.6	0.006	0.65	7500	400	15.7	0.004	0.65
2	0.5	6	24000	10000	393.7	0.1	0.75	20000	7100	279.5	0.08	0.75	16000	5700	224.4	0.06	0.75	12000	2500	98.4	0.03	0.75
2	0.5	10	24000	10000	393.7	0.08	0.75	20000	7100	279.5	0.06	0.75	16000	5700	224.4	0.05	0.75	12000	2500	98.4	0.025	0.75
2	0.5	15	20000	7000	275.6	0.05	0.75	17000	5000	196.9	0.04	0.75	13000	3200	126.0	0.03	0.75	10000	1800	70.9	0.016	0.75
2	0.5	20	20000	3600	141.7	0.04	0.75	17000	2600	102.4	0.03	0.75	13000	1800	70.9	0.025	0.75	10000	900	35.4	0.012	0.75
2	0.5	25	16000	1800	70.9	0.03	0.75	14000	1400	55.1	0.025	0.75	12000	1100	43.3	0.02	0.75	9000	720	28.3	0.01	0.75
2	0.5	30	16000	1400	55.1	0.025	0.75	14000	1200	47.2	0.02	0.75	12000	900	35.4	0.016	0.75	9000	650	25.6	0.008	0.75
2	0.5	35	13000	1100	43.3	0.02	0.75	11000	800	31.5	0.018	0.75	10000	700	27.6	0.014	0.75	7000	500	19.7	0.007	0.75
2	0.5	40	13000	1000	39.4	0.02	0.75	11000	700	27.6	0.015	0.75	10000	600	23.6	0.012	0.75	7000	400	15.7	0.006	0.75
3	0.5	10	16000	11000	433.1	0.12	1.5	13000	7800	307.1	0.09	1.5	11000	6300	248.0	0.07	1.5	8000	2800	110.2	0.04	1.5
3	0.5	15	16000	9000	354.3	0.11	1.5	13000	6400	252.0	0.08	1.5	11000	5100	200.8	0.06	1.5	8000	2300	90.6	0.04	1.5
3	0.5	20	13000	7200	283.5	0.09	1.5	11000	5100	200.8	0.07	1.5	8700	4000	157.5	0.05	1.5	6500	1800	70.9	0.03	1.5
3	0.5	30	13000	5700	224.4	0.06	1.5	11000	4000	157.5	0.05	1.5	8700	3000	118.1	0.04	1.5	6500	1400	55.1	0.02	1.5
3	0.8	10	16000	11000	433.1	0.24	1	13000	7800	307.1	0.19	1	11000	6300	248.0	0.14	1	8000	2800	110.2	0.07	1
3	0.8	15	16000	9000	354.3	0.22	1	13000	6400	252.0	0.17	1	11000	5100	200.8	0.13	1	8000	2300	90.6	0.07	1
3	0.8	20	13000	7200	283.5	0.19	1	11000	5100	200.8	0.15	1	8700	4000	157.5	0.11	1	6500	1800	70.9	0.06	1
3	0.8	30	13000	5700	224.4	0.12	1	11000	4000	157.5	0.09	1	8700	3000	118.1	0.07	1	6500	1400	55.1	0.04	1
3	0.8	40	11000	3600	141.7	0.08	1	9100	2600	102.4	0.06	1	7400	2000	78.7	0.05	1	5500	1000	39.4	0.025	1
3	0.8	50	8000	2600	102.4	0.07	1	6600	1800	70.9	0.05	1	5800	1500	59.1	0.04	1	4600	800	31.5	0.02	1
4	0.5	12	8400	6000	236.2	0.15	2	7000	4300	169.3	0.12	2	5600	3400	133.9	0.09	2	4200	1500	59.1	0.05	2
4	0.5	20	8400	6000	236.2	0.14	2	7000	4300	169.3	0.11	2	5600	3400	133.9	0.08	2	4200	1500	59.1	0.04	2
4	0.5	30	6900	4900	192.9	0.12	2	5700	3500	137.8	0.09	2	4600	2800	110.2	0.07	2	3500	1200	47.2	0.03	2
4	0.5	48	5600	2000	78.7	0.07	2	4600	1400	55.1	0.05	2	3800	1100	43.3	0.04	2	2800	500	19.7	0.02	2
4	1	12	12000	12000	472.4	0.3	1.5	10000	8500	334.6	0.23	1.5	8000	6800	267.7	0.18	1.5	6000	3000	118.1	0.1	1.5
4	1	20	12000	12000	472.4	0.27	1.5	10000	8500	334.6	0.21	1.5	8000	6800	267.7	0.16	1.5	6000	3000	118.1	0.08	1.5
4	1	30	10000	9900	389.8	0.24	1.5	8300	7000	275.6	0.19	1.5	6700	5600	220.5	0.14	1.5	5000	2500	98.4	0.07	1.5
6	0.5	18	4000	3900	153.5	0.15	3.5	3300	2800	110.2	0.12	3.5	2700	2200	86.6	0.09	3.5	2000	1000	39.4	0.05	3.5
6	0.5	30	4000	3900	153.5	0.14	3.5	3300	2800	110.2	0.11	3.5	2700	2200	86.6	0.08	3.5	2000	1000	39.4	0.04	3.5
6	1	18	8000	13000	511.8	0.5	3	6600	9200	362.2	0.4	3	5400	7400	291.3	0.3	3	4000	3300	129.9	0.15	3
6	1	30	8000	13000	511.8	0.45	3	6600	9200	362.2	0.35	3	5400	7400	291.3	0.27	3	4000	3300	129.9	0.14	3
6	1	54	6600	11000	433.1	0.25	3	5500	7800	307.1	0.2	3	4400	6300	248.0	0.15	3	3300	2800	110.2	0.08	3
6	1.5	18	8000	13000	511.8	0.5	2	6600	9200	362.2	0.4	2	5400	7400	291.3	0.3	2	4000	3300	129.9	0.15	2
6	1.5	30	8000	13000	511.8	0.45	2	6600	9200	362.2	0.35	2	5400	7400	291.3	0.27	2	4000	3300	129.9	0.14	2
6	1.5	42	6600	11000	433.1	0.4	2	5500	7800	307.1	0.3	2	4400	6300	248.0	0.24	2	3300	2800	110.2	0.12	2
6	1.5	54	6600	11000	433.1	0.25	2	5500	7800	307.1	0.2	2	4400	6300	248.0	0.15	2	3300	2800	110.2	0.08	2
6	2	18	8000	13000	511.8	0.5	1.5	6600	9200	362.2	0.4	1.5	5400	7400	291.3	0.3	1.5	4000	3300	129.9	0.15	1.5
6	2	30	8000	13000	511.8	0.45	1.5	6600	9200	362.2	0.35	1.5	5400	7400	291.3	0.27	1.5	4000	3300	129.9	0.14	1.5
Depth of cut																						

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Using air blow or mist is recommended.
3) When contour milling, cutting conditions can vary greatly due to the geometry of the workpiece and depth of cut.
4) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VFHVRB

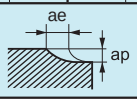
4 flute, Corner radius, Short cut length, Irregular helix flutes

High feed conditions

Work material			Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1—10, AISI P21 etc.					Hardened steel (45—55HRC) AISI H13 etc.					Hardened steel (55—62HRC) AISI D2 etc.				
DC (mm)	RE (mm)	LU (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
7	1.5	—	6800	13000	511.8	0.5	3	5600	9200	362.2	0.4	3	4600	7400	291.3	0.3	3	3400	3300	129.9	0.15	3
8	0.5	24	3000	3900	153.5	0.18	5	2500	2800	110.2	0.14	5	2000	2200	86.6	0.11	5	1500	1000	39.4	0.05	5
8	0.5	40	3000	3900	153.5	0.16	5	2500	2800	110.2	0.12	5	2000	2200	86.6	0.1	5	1500	1000	39.4	0.05	5
8	1	24	4200	6500	255.9	0.3	4.5	3500	4600	181.1	0.23	4.5	2800	3700	145.7	0.18	4.5	2100	1600	63.0	0.09	4.5
8	1	40	4200	6500	255.9	0.27	4.5	3500	4600	181.1	0.21	4.5	2800	3700	145.7	0.16	4.5	2100	1600	63.0	0.08	4.5
8	2	24	6000	13000	511.8	0.6	3	5000	9200	362.2	0.46	3	4000	7400	291.3	0.36	3	3000	3300	129.9	0.18	3
8	2	40	6000	13000	511.8	0.54	3	5000	9200	362.2	0.42	3	4000	7400	291.3	0.32	3	3000	3300	129.9	0.16	3
8	2	56	5000	11000	433.1	0.48	3	4200	7800	307.1	0.37	3	3400	6300	248.0	0.3	3	2500	2800	110.2	0.14	3
8	2	72	5000	11000	433.1	0.3	3	4200	7800	307.1	0.23	3	3400	6300	248.0	0.2	3	2500	2800	110.2	0.09	3
9	2	—	5300	13000	511.8	0.6	3.5	4400	9200	362.2	0.46	3.5	3600	7400	291.3	0.36	3.5	2700	3300	129.9	0.18	3.5
10	0.5	30	2400	3900	153.5	0.18	6.5	2000	2800	110.2	0.14	6.5	1600	2200	86.6	0.11	6.5	1200	1000	39.4	0.05	6.5
10	0.5	50	2400	3900	153.5	0.16	6.5	2000	2800	110.2	0.12	6.5	1600	2200	86.6	0.1	6.5	1200	1000	39.4	0.05	6.5
10	1	30	3300	6500	255.9	0.3	6	2700	4600	181.1	0.23	6	2200	3700	145.7	0.18	6	1700	1600	63.0	0.09	6
10	1	50	3300	6500	255.9	0.27	6	2700	4600	181.1	0.21	6	2200	3700	145.7	0.16	6	1700	1600	63.0	0.08	6
10	2	30	4800	13000	511.8	0.6	4.5	4000	9200	362.2	0.46	4.5	3200	7400	291.3	0.36	4.5	2400	3300	129.9	0.18	4.5
10	2	50	4800	13000	511.8	0.54	4.5	4000	9200	362.2	0.42	4.5	3200	7400	291.3	0.32	4.5	2400	3300	129.9	0.16	4.5
10	2	70	4000	11000	433.1	0.48	4.5	3300	7800	307.1	0.37	4.5	2700	6300	248.0	0.3	4.5	2000	2800	110.2	0.14	4.5
10	2	90	4000	11000	433.1	0.48	4.5	3300	7800	307.1	0.37	4.5	2700	6300	248.0	0.3	4.5	2000	2800	110.2	0.14	4.5
11	2	—	4300	12000	472.4	0.6	5	3600	8500	334.6	0.46	5	2900	6800	267.7	0.36	5	2200	3000	118.1	0.18	5
12	0.5	36	2000	3600	141.7	0.27	8	1700	2600	102.4	0.21	8	1300	2100	82.7	0.14	8	1000	900	35.4	0.07	8
12	0.5	60	2000	3600	141.7	0.24	8	1700	2600	102.4	0.18	8	1300	2100	82.7	0.12	8	1000	900	35.4	0.06	8
12	1	36	2400	4800	189.0	0.36	7.5	2000	3400	133.9	0.28	7.5	1600	2700	106.3	0.18	7.5	1200	1200	47.2	0.09	7.5
12	1	60	2400	4800	189.0	0.32	7.5	2000	3400	133.9	0.25	7.5	1600	2700	106.3	0.16	7.5	1200	1200	47.2	0.08	7.5
12	2	36	4000	12000	472.4	0.9	6	3300	8500	334.6	0.7	6	2700	6800	267.7	0.45	6	2000	3000	118.1	0.23	6
12	2	60	4000	12000	472.4	0.8	6	3300	8500	334.6	0.6	6	2700	6800	267.7	0.4	6	2000	3000	118.1	0.2	6
12	2	84	3300	9900	389.8	0.7	6	2700	7000	275.6	0.55	6	2200	5600	220.5	0.36	6	1700	2500	98.4	0.18	6
12	2	108	3300	9900	389.8	0.45	6	2700	7000	275.6	0.35	6	2200	5600	220.5	0.23	6	1700	2500	98.4	0.11	6
12	3	36	4000	12000	472.4	0.9	4.5	3300	8500	334.6	0.7	4.5	2700	6800	267.7	0.45	4.5	2000	3000	118.1	0.23	4.5
12	3	60	4000	12000	472.4	0.8	4.5	3300	8500	334.6	0.6	4.5	2700	6800	267.7	0.4	4.5	2000	3000	118.1	0.2	4.5
13	3	—	3700	12000	472.4	0.9	5	3100	8500	334.6	0.7	5	2500	6800	267.7	0.45	5	1900	3000	118.1	0.23	5
16	0.5	42	1500	3000	118.1	0.27	11	1200	2100	82.7	0.21	11	1000	1700	66.9	0.12	11	750	750	29.5	0.05	11
16	2	42	2100	5000	196.9	0.45	9	1700	3600	141.7	0.35	9	1400	2900	114.2	0.2	9	1100	1300	51.2	0.08	9
16	3	42	3000	10000	393.7	0.9	7.5	2500	7100	279.5	0.7	7.5	2000	5700	224.4	0.4	7.5	1500	2500	98.4	0.15	7.5
16	3	80	3000	10000	393.7	0.8	7.5	2500	7100	279.5	0.6	7.5	2000	5700	224.4	0.37	7.5	1500	2500	98.4	0.14	7.5
16	3	120	2500	8300	326.8	0.7	7.5	2100	5900	232.3	0.55	7.5	1700	4700	185.0	0.32	7.5	1300	2100	82.7	0.12	7.5
Depth of cut																						

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Using air blow or mist is recommended.
3) When contour milling, cutting conditions can vary greatly due to the geometry of the workpiece and depth of cut.
4) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

High depth of cut conditions

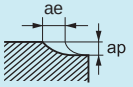
Work material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.					Hardened steel (45−55HRC) AISI H13 etc.					Hardened steel (55−62HRC) AISI D2 etc.				
DC (mm)	RE (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
1	0.2	4	24000	2200	86.6	0.08	0.45	20000	1500	59.1	0.07	0.45	16000	1200	47.2	0.05	0.45	12000	550	21.7	0.025	0.45
1	0.2	6	24000	2000	78.7	0.07	0.45	20000	1400	55.1	0.05	0.45	16000	1100	43.3	0.04	0.45	12000	500	19.7	0.02	0.45
1	0.2	8	19000	1400	55.1	0.05	0.45	16000	1000	39.4	0.04	0.45	13000	800	31.5	0.03	0.45	9500	350	13.8	0.016	0.45
1	0.2	10	14000	800	31.5	0.04	0.45	12000	600	23.6	0.03	0.45	9000	400	15.7	0.025	0.45	7000	200	7.9	0.012	0.45
1	0.2	15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	0.2	20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1.5	0.3	4	19000	3000	118.1	0.2	0.65	16000	2100	82.7	0.16	0.65	13000	1700	66.9	0.12	0.65	9500	750	29.5	0.06	0.65
1.5	0.3	6	19000	2300	90.6	0.16	0.65	16000	1600	63.0	0.13	0.65	13000	1300	51.2	0.1	0.65	9500	580	22.8	0.05	0.65
1.5	0.3	10	16000	1700	66.9	0.1	0.65	13000	1200	47.2	0.07	0.65	11000	1000	39.4	0.05	0.65	8000	430	16.9	0.03	0.65
1.5	0.3	15	13000	1000	39.4	0.06	0.65	11000	700	27.6	0.05	0.65	9000	600	23.6	0.04	0.65	6500	250	9.8	0.018	0.65
1.5	0.3	20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1.5	0.3	25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1.5	0.3	30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	0.5	6	14000	3000	118.1	0.2	0.75	12000	2100	82.7	0.16	0.75	9400	1700	66.9	0.12	0.75	7000	750	29.5	0.06	0.75
2	0.5	10	14000	3000	118.1	0.16	0.75	12000	2100	82.7	0.13	0.75	9400	1700	66.9	0.1	0.75	7000	750	29.5	0.05	0.75
2	0.5	15	12000	2100	82.7	0.1	0.75	10000	1500	59.1	0.08	0.75	8000	1200	47.2	0.06	0.75	6000	530	20.9	0.03	0.75
2	0.5	20	12000	1100	43.3	0.08	0.75	10000	800	31.5	0.06	0.75	8000	600	23.6	0.05	0.75	6000	280	11.0	0.025	0.75
2	0.5	25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	0.5	30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	0.5	35	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	0.5	40	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3	0.5	10	9600	3300	129.9	0.24	1.5	8000	2300	90.6	0.2	1.5	6400	1800	70.9	0.14	1.5	4800	830	32.7	0.07	1.5
3	0.5	15	9600	2700	106.3	0.22	1.5	8000	1900	74.8	0.17	1.5	6400	1500	59.1	0.13	1.5	4800	680	26.8	0.06	1.5
3	0.5	20	7800	2200	86.6	0.18	1.5	6500	1500	59.1	0.14	1.5	5200	1200	47.2	0.11	1.5	3900	550	21.7	0.05	1.5
3	0.5	30	7800	1700	66.9	0.12	1.5	6500	1200	47.2	0.1	1.5	5200	1000	39.4	0.07	1.5	3900	430	16.9	0.04	1.5
3	0.8	10	9600	3300	129.9	0.5	1	8000	2300	90.6	0.4	1	6400	1800	70.9	0.3	1	4800	830	32.7	0.14	1
3	0.8	15	9600	2700	106.3	0.5	1	8000	1900	74.8	0.35	1	6400	1500	59.1	0.25	1	4800	680	26.8	0.13	1
3	0.8	20	7800	2200	86.6	0.4	1	6500	1500	59.1	0.3	1	5200	1200	47.2	0.23	1	3900	550	21.7	0.11	1
3	0.8	30	7800	1700	66.9	0.24	1	6500	1200	47.2	0.2	1	5200	1000	39.4	0.14	1	3900	430	16.9	0.05	1
3	0.8	40	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3	0.8	50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4	0.5	12	5000	1800	70.9	0.3	2	4200	1300	51.2	0.24	2	3400	1000	39.4	0.18	2	2500	450	17.7	0.06	2
4	0.5	20	5000	1800	70.9	0.3	2	4200	1300	51.2	0.22	2	3400	1000	39.4	0.17	2	2500	450	17.7	0.06	2
4	0.5	30	4100	1500	59.1	0.24	2	3400	1100	43.3	0.19	2	2700	840	33.1	0.14	2	2100	380	15.0	0.05	2
4	0.5	48	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4	1	12	7200	3600	141.7	0.6	1.5	6000	2500	98.4	0.5	1.5	4800	2000	78.7	0.36	1.5	3600	900	35.4	0.12	1.5
4	1	20	7200	3600	141.7	0.6	1.5	6000	2500	98.4	0.4	1.5	4800	2000	78.7	0.32	1.5	3600	900	35.4	0.11	1.5
4	1	30	6000	3000	118.1	0.5	1.5	5000	2100	82.7	0.4	1.5	4000	1700	66.9	0.3	1.5	3000	750	29.5	0.1	1.5
6	0.5	18	2400	1200	47.2	0.3	3.5	2000	840	33.1	0.24	3.5	1600	670	26.4	0.18	3.5	1200	300	11.8	0.06	3.5
6	0.5	30	2400	1200	47.2	0.3	3.5	2000	840	33.1	0.22	3.5	1600	670	26.4	0.17	3.5	1200	300	11.8	0.06	3.5
6	1	18	4800	3900	153.5	1	3	4000	2700	106.3	0.8	3	3200	2200	86.6	0.6	3	2400	980	38.6	0.2	3
6	1	30	4800	3900	153.5	0.9	3	4000	2700	106.3	0.7	3	3200	2200	86.6	0.5	3	2400	980	38.6	0.18	3
6	1	54	4000	3300	129.9	0.5	3	3300	2300	90.6	0.4	3	2700	1800	70.9	0.3	3	2000	830	32.7	0.1	3
6	1.5	18	4800	3900	153.5	1	2	4000	2700	106.3	0.8	2	3200	2200	86.6	0.6	2	2400	980	38.6	0.2	2
6	1.5	30	4800	3900	153.5	0.9	2	4000	2700	106.3	0.7	2	3200	2200	86.6	0.5	2	2400	980	38.6	0.18	2
6	1.5	42	4000	3300	129.9	0.8	2	3300	2300	90.6	0.6	2	2700	1800	70.9	0.5	2	2000	830	32.7	0.16	2
6	1.5	54	4000	3300	129.9	0.5	2	3300	2300	90.6	0.4	2	2700	1800	70.9	0.3	2	2000	830	32.7	0.1	2
6	2	18	4800	3900	153.5	1	1.5	4000	2700	106.3	0.8	1.5	3200	2200	86.6	0.6	1.5	2400	980	38.6	0.2	1.5
6	2	30	4800	3900	153.5	0.9	1.5	4000	2700	106.3	0.7	1.5	3200	2200	86.6	0.5	1.5	2400	980	38.6	0.18	1.5
Depth of cut																						

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Using air blow or mist is recommended.
3) When contour milling, cutting conditions can vary greatly due to the geometry of the workpiece and depth of cut.
4) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VFHVRB

4 flute, Corner radius, Short cut length, Irregular helix flutes

High depth of cut conditions

Work material			Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1—10, AISI P21 etc.					Hardened steel (45—55HRC) AISI H13 etc.					Hardened steel (55—62HRC) AISI D2 etc.				
DC (mm)	RE (mm)	LU (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
7	1.5	—	4100	3900	153.5	1	3	3400	2700	106.3	0.8	3	2700	2200	86.6	0.6	3	2100	980	38.6	0.2	3
8	0.5	24	1800	1200	47.2	0.35	5	1500	840	33.1	0.3	5	1200	670	26.4	0.2	5	900	300	11.8	0.07	5
8	0.5	40	1800	1200	47.2	0.3	5	1500	840	33.1	0.25	5	1200	670	26.4	0.2	5	900	300	11.8	0.06	5
8	1	24	2500	2000	78.7	0.6	4.5	2100	1400	55.1	0.5	4.5	1700	1100	43.3	0.4	4.5	1300	500	19.7	0.12	4.5
8	1	40	2500	2000	78.7	0.5	4.5	2100	1400	55.1	0.4	4.5	1700	1100	43.3	0.3	4.5	1300	500	19.7	0.11	4.5
8	2	24	3600	3900	153.5	1.2	3	3000	2700	106.3	1	3	2400	2200	86.6	0.7	3	1800	980	38.6	0.24	3
8	2	40	3600	3900	153.5	1.1	3	3000	2700	106.3	0.9	3	2400	2200	86.6	0.7	3	1800	980	38.6	0.22	3
8	2	56	3000	3300	129.9	1	3	2500	2300	90.6	0.8	3	2000	1800	70.9	0.6	3	1500	830	32.7	0.2	3
8	2	72	3000	3300	129.9	0.6	3	2500	2300	90.6	0.5	3	2000	1800	70.9	0.4	3	1500	830	32.7	0.12	3
9	2	—	3200	3900	153.5	1.2	3.5	2700	2700	106.3	1	3.5	2100	2200	86.6	0.7	3.5	1600	980	38.6	0.24	3.5
10	0.5	30	1400	1200	47.2	0.35	6.5	1200	840	33.1	0.3	6.5	940	670	26.4	0.2	6.5	700	300	11.8	0.07	6.5
10	0.5	50	1400	1200	47.2	0.3	6.5	1200	840	33.1	0.25	6.5	940	670	26.4	0.2	6.5	700	300	11.8	0.06	6.5
10	1	30	2000	2000	78.7	0.6	6	1700	1400	55.1	0.5	6	1300	1100	43.3	0.4	6	1000	500	19.7	0.12	6
10	1	50	2000	2000	78.7	0.5	6	1700	1400	55.1	0.4	6	1300	1100	43.3	0.3	6	1000	500	19.7	0.11	6
10	2	30	2900	3900	153.5	1.2	4.5	2400	2700	106.3	1	4.5	1900	2200	86.6	0.7	4.5	1500	980	38.6	0.24	4.5
10	2	50	2900	3900	153.5	1.1	4.5	2400	2700	106.3	0.9	4.5	1900	2200	86.6	0.7	4.5	1500	980	38.6	0.22	4.5
10	2	70	2400	3300	129.9	1	4.5	2000	2300	90.6	0.8	4.5	1600	1800	70.9	0.6	4.5	1200	830	32.7	0.2	4.5
10	2	90	2400	3300	129.9	1	4.5	2000	2300	90.6	0.8	4.5	1600	1800	70.9	0.6	4.5	1200	830	32.7	0.2	4.5
11	2	—	2600	3600	141.7	1.2	5	2200	2500	98.4	1	5	1700	2000	78.7	0.7	5	1300	900	35.4	0.24	5
12	0.5	36	1200	1100	43.3	0.5	8	1000	770	30.3	0.4	8	800	620	24.4	0.3	8	600	280	11.0	0.11	8
12	0.5	60	1200	1100	43.3	0.5	8	1000	770	30.3	0.4	8	800	620	24.4	0.3	8	600	280	11.0	0.1	8
12	1	36	1400	1400	55.1	0.7	7.5	1200	1000	39.4	0.6	7.5	940	780	30.7	0.4	7.5	700	350	13.8	0.14	7.5
12	1	60	1400	1400	55.1	0.6	7.5	1200	1000	39.4	0.5	7.5	940	780	30.7	0.4	7.5	700	350	13.8	0.13	7.5
12	2	36	2400	3600	141.7	1.8	6	2000	2500	98.4	1.4	6	1600	2000	78.7	1.1	6	1200	900	35.4	0.4	6
12	2	60	2400	3600	141.7	1.6	6	2000	2500	98.4	1.3	6	1600	2000	78.7	1	6	1200	900	35.4	0.3	6
12	2	84	2000	3000	118.1	1.4	6	1700	2100	82.7	1.1	6	1300	1700	66.9	0.8	6	1000	750	29.5	0.3	6
12	2	108	2000	3000	118.1	0.9	6	1700	2100	82.7	0.7	6	1300	1700	66.9	0.5	6	1000	750	29.5	0.2	6
12	3	36	2400	3600	141.7	1.8	4.5	2000	2500	98.4	1.4	4.5	1600	2000	78.7	1.1	4.5	1200	900	35.4	0.4	4.5
12	3	60	2400	3600	141.7	1.6	4.5	2000	2500	98.4	1.3	4.5	1600	2000	78.7	1	4.5	1200	900	35.4	0.3	4.5
13	3	—	2200	3600	141.7	1.8	5	1800	2500	98.4	1.4	5	1500	2000	78.7	1.1	5	1100	900	35.4	0.4	5
16	0.5	42	900	900	35.4	0.5	11	750	630	24.8	0.4	11	600	500	19.7	0.3	11	450	230	9.1	0.1	11
16	2	42	1300	1500	59.1	0.9	9	1100	1100	43.3	0.7	9	870	840	33.1	0.5	9	650	380	15.0	0.2	9
16	3	42	1800	3000	118.1	1.8	7.5	1500	2100	82.7	1.4	7.5	1200	1700	66.9	0.9	7.5	900	750	29.5	0.4	7.5
16	3	80	1800	3000	118.1	1.6	7.5	1500	2100	82.7	1.3	7.5	1200	1700	66.9	0.8	7.5	900	750	29.5	0.3	7.5
16	3	120	1500	2500	98.4	1.4	7.5	1200	1800	70.9	1.1	7.5	1000	1400	55.1	0.7	7.5	750	630	24.8	0.3	7.5
Depth of cut																						

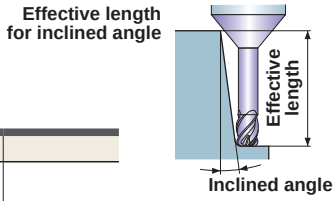
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Using air blow or mist is recommended.
3) When contour milling, cutting conditions can vary greatly due to the geometry of the workpiece and depth of cut.
4) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

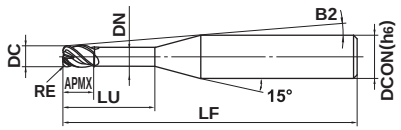
VFHVRB – Inch sizes

4 flute, Corner radius, Short cut length, Irregular helix flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎	◎	○	○		







R					
	±.0004"				
	0 - .0008"				
h6	.2500"≤DMM≤.3750"	DMM=.5000"			
	0 - .00035	0 - .00043			

● Impact Miracle corner radius end mill for high feed and efficient machining.

Unit : inch

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Effective length for inclined angle			
											30'	1°	2°	3°
VFHVRBD1/8N3DR0.03	.1250	.030	.125	.375	.1211	6.1°	2.25	.2500	4	●	9.9	10.3	11	11.9
VFHVRB**D1/8N5DR0.03**	.1250	.030	.125	.625	.1211	4.3°	2.25	.2500	4	●	16.5	17.1	18.3	19.8
VFHVRB**D3/16N3DR0.05**	.1875	.050	.188	.563	.1835	2.9°	2.25	.2500	4	●	14.9	15.4	16.4	*
VFHVRB**D3/16N5DR0.05**	.1875	.050	.188	.938	.1835	1.8°	2.25	.2500	4	●	24.7	25.6	*	*
VFHVRB**D1/4N3DR0.06**	.2500	.060	.375	.750	.2441	–	2.25	.2500	4	●	*	*	*	*
VFHVRB**D1/4N5DR0.06**	.2500	.060	.375	1.250	.2441	–	3.00	.2500	4	●	*	*	*	*
VFHVRB**D5/16N3DR0.08**	.3125	.080	.469	.938	.3066	–	3.00	.3125	4	●	*	*	*	*
VFHVRB**D5/16N5DR0.08**	.3125	.080	.469	1.563	.3066	–	4.00	.3125	4	●	*	*	*	*
VFHVRB**D3/8N3DR0.08**	.3750	.080	.563	1.125	.3691	–	3.00	.3750	4	●	*	*	*	*
VFHVRB**D3/8N5DR0.08**	.3750	.080	.563	1.875	.3691	–	4.00	.3750	4	●	*	*	*	*
VFHVRB**D1/2N3DR0.12**	.5000	.120	.750	1.500	.4882	–	4.00	.5000	4	●	*	*	*	*
VFHVRB**D1/2N5DR0.12**	.5000	.120	.750	2.500	.4882	–	5.00	.5000	4	●	*	*	*	*

* No interference

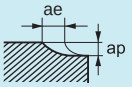
● : Inventory maintained.

VFHVRB – Inch sizes

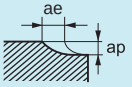
4 flute, Corner radius, Short cut length, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

High feed conditions

Work material			Carbon Steel, Cast Iron, Alloy Steel (—30HRC) AISI 1049, AISI 30, AISI P20					Alloy steel, Tool steel, Pre-haedened steel AIAI H13, AISI W1-10, AISI P21					Hardened Steel (45—55HRC) AISI H13					Hardened Steel (55—62HRC) AISI D2				
DC (inch)	RE (inch)	LU (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
0.1250	0.03	0.375	16000	11000	433.1	.009	.039	13000	7800	307.1	.007	.039	11000	6300	248	.006	.039	8000	2800	110.2	.003	.039
0.1250	0.03	0.625	16000	9000	354.3	.009	.039	13000	6400	252	.007	.039	11000	5100	200.8	.006	.039	8000	2300	90.6	.003	.039
0.1875	0.05	0.563	12000	12000	472.4	.012	.059	10000	8500	334.6	.009	.059	8000	6800	267.7	.007	.059	6000	3000	118.1	.004	.059
0.1875	0.05	0.938	12000	12000	472.4	.011	.059	10000	8500	334.6	.008	.059	8000	6800	267.7	.006	.059	6000	3000	118.1	.003	.059
0.2500	0.06	0.750	8000	13000	511.8	.020	.078	6600	9200	362.2	.016	.078	5400	7400	291.3	.012	.078	4000	3300	129.9	.006	.078
0.2500	0.06	1.250	8000	13000	511.8	.018	.078	6600	9200	362.2	.014	.078	5400	7400	291.3	.011	.078	4000	3300	129.9	.006	.078
0.3125	0.08	0.938	6000	13000	511.8	.024	.118	5000	9200	362.2	.018	.118	4000	7400	291.3	.014	.118	3000	3300	129.9	.007	.118
0.3125	0.08	1.563	6000	13000	511.8	.021	.118	5000	9200	362.2	.017	.118	4000	7400	291.3	.013	.118	3000	3300	129.9	.006	.118
0.3750	0.08	1.125	4800	13000	511.8	.024	.177	4000	9200	362.2	.018	.177	3200	7400	291.3	.014	.177	2400	3300	129.9	.007	.177
0.3750	0.08	1.875	4800	13000	511.8	.021	.177	4000	9200	362.2	.017	.177	3200	7400	291.3	.013	.177	2400	3300	129.9	.006	.177
0.5000	0.12	1.500	4000	12000	472.4	.035	.177	3300	8500	334.6	.028	.177	2700	6800	267.7	.018	.177	2000	3000	118.1	.009	.177
0.5000	0.12	2.500	4000	12000	472.4	.031	.177	3300	8500	334.6	.024	.177	2700	6800	267.7	.016	.177	2000	3000	118.1	.008	.177
Depth of cut																						

High depth of cut conditions

Work material			Carbon Steel, Cast Iron, Alloy Steel (—30HRC) AISI 1049, AISI 30, AISI P20					Alloy steel, Tool steel, Pre-haedened steel AIAI H13, AISI W1-10, AISI P21					Hardened Steel (45—55HRC) AISI H13					Hardened Steel (55—62HRC) AISI D2				
DC (inch)	RE (inch)	LU (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
0.1250	0.03	0.375	9600	3300	129.9	.020	.039	8000	2300	90.6	.016	.039	6400	1800	70.9	.012	.039	4800	830	32.7	.006	.039
0.1250	0.03	0.625	9600	2700	106.3	.020	.039	8000	1900	74.8	.014	.039	6400	1500	59.1	.010	.039	4800	680	26.8	.005	.039
0.1875	0.05	0.563	7200	3600	141.7	.024	.059	6000	2500	98.4	.020	.059	4800	2000	78.7	.014	.059	3600	900	35.4	.005	.059
0.1875	0.05	0.938	7200	3600	141.7	.024	.059	6000	2500	98.4	.016	.059	4800	2000	78.7	.013	.059	3600	900	35.4	.004	.059
0.2500	0.06	0.750	4000	3300	129.9	.020	.118	3300	2300	90.6	.016	.118	2700	1800	70.9	.012	.118	2000	830	32.7	.004	.118
0.2500	0.06	1.250	4800	3900	153.5	.040	.079	4000	2700	106.3	.031	.079	3200	2200	86.6	.024	.079	2400	980	38.6	.008	.079
0.3125	0.08	0.938	3600	3900	153.5	.047	.118	3000	2700	106.3	.040	.118	2400	2200	86.6	.028	.118	1800	980	38.6	.009	.118
0.3125	0.08	1.563	3600	3900	153.5	.043	.118	3000	2700	106.3	.035	.118	2400	2200	86.6	.028	.118	1800	980	38.6	.009	.118
0.3750	0.08	1.125	2900	3900	153.5	.047	.177	2400	2700	106.3	.040	.177	1900	2200	86.6	.028	.177	1500	980	38.6	.009	.177
0.3750	0.08	1.875	2900	3900	153.5	.043	.177	2400	2700	106.3	.035	.177	1900	2200	86.6	.028	.177	1500	980	38.6	.009	.177
0.5000	0.12	1.500	2400	3600	141.7	.071	.177	2000	2500	98.4	.055	.177	1600	2000	78.7	.043	.177	1200	900	35.4	.016	.177
0.5000	0.12	2.500	2400	3600	141.7	.063	.177	2000	2500	98.4	.051	.177	1600	2000	78.7	.040	.177	1200	900	35.4	.012	.177
Depth of cut																						

1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Using air blow or mist is recommended.
3) When contour milling, cutting conditions can vary greatly due to the geometry of the workpiece and depth of cut.
4) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

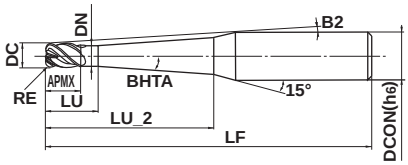
VFHVRB

4 flute, Corner radius, Short cut length, Irregular helix flutes

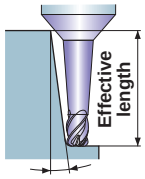
Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎	◎	○	○		

Taper neck type





Effective length for inclined angle



Inclined angle

R	DC≤10	DC>10			
	±0.007	±0.01			
	DC≤12				
	0 - 0.02				
h6	DCON=6	8≤DCON≤10	12≤DCON≤16		
	0 - 0.008	0 - 0.009	0 - 0.011		

● Impact Miracle corner radius end mill for high feed and efficient machining.

Unit : mm

Order Number	DC	RE	BHTA	APMX	LU_2	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Effective length for inclined angle 30'	1°	2°	3°
VFHVRBD010R02N006T09	1	0.2	0.9°	1	6	2.5	0.94	9.3°	60	6	4	●	—	6.6	7.1	7.6
VFHVRB**D010R02N010T09**	1	0.2	0.9°	1	10	2.5	0.94	7.5°	60	6	4	●	—	10.6	11.4	12.3
VFHVRB**D010R02N015T09**	1	0.2	0.9°	1	15	2.5	0.94	6.1°	60	6	4	●	—	15.6	16.8	18.1
VFHVRB**D010R02N020T09**	1	0.2	0.9°	1	20	2.5	0.94	5.1°	80	6	4	●	—	20.6	22.1	23.9
VFHVRB**D010R02N025T09**	1	0.2	0.9°	1	25	2.5	0.94	4.4°	80	6	4	●	—	25.6	27.5	29.7
VFHVRB**D010R02N030T09**	1	0.2	0.9°	1	30	2.5	0.94	3.8°	80	6	4	●	—	30.6	32.9	35.5
VFHVRB**D010R02N035T09**	1	0.2	0.9°	1	35	2.5	0.94	3.4°	90	6	4	●	—	35.6	38.3	41.3
VFHVRB**D010R02N040T09**	1	0.2	0.9°	1	40	2.5	0.94	3.1°	90	6	4	●	—	40.6	43.6	47.2
VFHVRB**D010R02N045T09**	1	0.2	0.9°	1	45	2.5	0.94	2.8°	90	6	4	●	—	45.6	49	*
VFHVRB**D010R02N050T09**	1	0.2	0.9°	1	50	2.5	0.94	2.6°	90	6	4	●	—	50.6	54.4	*
VFHVRB**D015R03N010T09**	1.5	0.3	0.9°	1.5	10	3	1.44	7.1°	60	6	4	●	—	10.6	11.4	12.3
VFHVRB**D015R03N015T09**	1.5	0.3	0.9°	1.5	15	3	1.44	5.7°	60	6	4	●	—	15.6	16.8	18.1
VFHVRB**D015R03N020T09**	1.5	0.3	0.9°	1.5	20	3	1.44	4.7°	80	6	4	●	—	20.6	22.2	23.9
VFHVRB**D015R03N030T09**	1.5	0.3	0.9°	1.5	30	3	1.44	3.5°	80	6	4	●	—	30.6	32.9	35.6
VFHVRB**D015R03N040T09**	1.5	0.3	0.9°	1.5	40	3	1.44	2.8°	90	6	4	●	—	40.6	43.7	*
VFHVRB**D015R03N050T09**	1.5	0.3	0.9°	1.5	50	3	1.44	2.4°	90	6	4	●	—	50.6	54.4	*
VFHVRB**D020R05N015T04**	2	0.5	0.4°	2	15	4	1.9	5.2°	60	6	4	●	15.6	16.2	17.4	18.7
VFHVRB**D020R05N020T04**	2	0.5	0.4°	2	20	4	1.9	4.3°	80	6	4	●	20.6	21.3	22.9	24.7
VFHVRB**D020R05N025T04**	2	0.5	0.4°	2	25	4	1.9	3.6°	80	6	4	●	25.6	26.5	28.5	30.8
VFHVRB**D020R05N030T04**	2	0.5	0.4°	2	30	4	1.9	3.2°	80	6	4	●	30.6	31.7	34	36.8
VFHVRB**D020R05N035T04**	2	0.5	0.4°	2	35	4	1.9	2.8°	80	6	4	●	35.6	36.9	39.6	*
VFHVRB**D020R05N040T04**	2	0.5	0.4°	2	40	4	1.9	2.5°	80	6	4	●	40.6	42	45.2	*
VFHVRB**D020R05N020T09**	2	0.5	0.9°	2	20	4	1.9	4.4°	80	6	4	●	—	20.8	22.3	24.1
VFHVRB**D020R05N025T09**	2	0.5	0.9°	2	25	4	1.9	3.7°	90	6	4	●	—	25.8	27.7	29.9
VFHVRB**D020R05N030T09**	2	0.5	0.9°	2	30	4	1.9	3.2°	90	6	4	●	—	30.8	33	35.7
VFHVRB**D020R05N035T09**	2	0.5	0.9°	2	35	4	1.9	2.9°	90	6	4	●	—	35.8	38.4	*
VFHVRB**D020R05N040T09**	2	0.5	0.9°	2	40	4	1.9	2.6°	90	6	4	●	—	40.8	43.8	*
VFHVRB**D020R05N045T09**	2	0.5	0.9°	2	45	4	1.9	2.3°	90	6	4	●	—	45.8	49.2	*
VFHVRB**D020R05N050T09**	2	0.5	0.9°	2	50	4	1.9	2.2°	100	6	4	●	—	50.8	54.5	*
VFHVRB**D020R05N055T09**	2	0.5	0.9°	2	55	4	1.9	2°	100	6	4	●	—	55.8	59.9	*
VFHVRB**D020R05N060T09**	2	0.5	0.9°	2	60	4	1.9	1.8°	100	6	4	●	—	60.8	*	*

* No interference

● : Inventory maintained.

VFHVRB

4 flute, Corner radius, Short cut length, Irregular helix flutes

Unit : mm

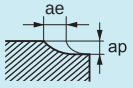
Order Number	DC	RE	BHTA	APMX	LU_2	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Effective length for inclined angle			
													30'	1°	2°	3°
VFHVRBD030R08N020T09	3	0.8	0.9°	3	20	6	2.9	3.6°	80	6	4	●	—	20.9	22.4	24.1
VFHVRBD030R08N025T09	3	0.8	0.9°	3	25	6	2.9	3°	80	6	4	●	—	25.9	27.8	30
VFHVRBD030R08N030T09	3	0.8	0.9°	3	30	6	2.9	2.6°	80	6	4	●	—	30.9	33.1	*
VFHVRBD030R08N040T09	3	0.8	0.9°	3	40	6	2.9	2°	90	6	4	●	—	40.9	43.9	*
VFHVRBD030R08N050T09	3	0.8	0.9°	3	50	6	2.9	1.7°	90	6	4	●	—	50.9	*	*
VFHVRBD030R08N060T09	3	0.8	0.9°	3	60	6	2.9	1.4°	100	6	4	●	—	60.9	*	*
VFHVRBD040R10N025T04	4	1	0.4°	4	25	7	3.9	2.1°	80	6	4	●	25.7	26.6	28.5	*
VFHVRBD040R10N030T04	4	1	0.4°	4	30	7	3.9	1.8°	80	6	4	●	30.7	31.8	*	*
VFHVRBD040R10N035T04	4	1	0.4°	4	35	7	3.9	1.6°	80	6	4	●	35.7	36.9	*	*
VFHVRBD040R10N040T04	4	1	0.4°	4	40	7	3.9	1.4°	80	6	4	●	40.7	42.1	*	*
VFHVRBD040R10N045T04	4	1	0.4°	4	45	7	3.9	1.3°	90	6	4	●	45.7	47.3	*	*
VFHVRBD040R10N050T04	4	1	0.4°	4	50	7	3.9	1.2°	90	6	4	●	50.7	52.5	*	*
VFHVRBD040R10N025T09	4	1	0.9°	4	25	7	3.9	2.2°	90	6	4	●	—	25.9	27.8	*
VFHVRBD040R10N030T09	4	1	0.9°	4	30	7	3.9	1.9°	90	6	4	●	—	30.9	*	*
VFHVRBD040R10N040T09	4	1	0.9°	4	40	7	3.9	1.4°	100	6	4	●	—	40.9	*	*
VFHVRBD040R10N050T09	4	1	0.9°	4	50	7	3.9	1.2°	100	6	4	●	—	50.9	*	*
VFHVRBD040R10N060T09	4	1	0.9°	4	60	7	3.9	1°	100	6	4	●	—	60.9	*	*
VFHVRBD060R15N040T09	6	1.5	0.9°	9	40	12	5.85	1.4°	110	8	4	●	—	41.4	*	*
VFHVRBD060R15N050T09	6	1.5	0.9°	9	50	12	5.85	1.2°	110	8	4	●	—	51.4	*	*
VFHVRBD060R15N060T09	6	1.5	0.9°	9	60	12	5.85	1°	110	8	4	●	—	61.4	*	*
VFHVRBD060R15N070T09	6	1.5	0.9°	9	70	12	5.85	0.9°	110	8	4	●	—	*	*	*
VFHVRBD080R20N060T09	8	2	0.9°	12	60	15	7.85	1°	150	10	4	●	—	61.5	*	*
VFHVRBD080R20N080T09	8	2	0.9°	12	80	15	7.85	0.8°	150	10	4	●	—	*	*	*
VFHVRBD100R20N080T09	10	2	0.9°	15	80	18	9.7	2°	130	16	4	●	—	82	88	*
VFHVRBD100R20N120T09	10	2	0.9°	15	120	18	9.7	1.4°	180	16	4	●	—	122	*	*
VFHVRBD120R20N080T09	12	2	0.9°	18	80	21	11.7	1.4°	130	16	4	●	—	82.2	*	*
VFHVRBD120R20N120T09	12	2	0.9°	18	120	21	11.7	1°	180	16	4	●	—	122.2	*	*

* No interference

● : Inventory maintained.

RECOMMENDED CUTTING CONDITIONS

Taper neck type

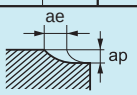
Work material				Carbon Steel, Cast Iron, Alloy Steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21					Hardened Steel (45−55HRC) AISI H13					Hardened Steel (55−62HRC) AISI D2				
DC (mm)	RE (mm)	BHTA	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap(mm)	Width of cut ae(mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap(mm)	Width of cut ae(mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap(mm)	Width of cut ae(mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap(mm)	Width of cut ae(mm)
1	0.2	0.9°	6	40000	6500	255.9	0.03	0.45	33000	4600	181.1	0.022	0.45	27000	3700	145.7	0.018	0.45	20000	1600	63.0	0.01	0.45
1	0.2	0.9°	10	24000	2700	106.3	0.015	0.45	20000	1900	74.8	0.01	0.45	16000	1500	59.1	0.008	0.45	12000	700	27.6	0.006	0.45
1	0.2	0.9°	15	16000	1200	47.2	0.013	0.45	14000	700	27.6	0.008	0.45	12000	500	19.7	0.007	0.45	10000	400	15.7	0.003	0.45
1	0.2	0.9°	20	14000	1000	39.4	0.01	0.45	12000	600	23.6	0.006	0.45	10000	400	15.7	0.005	0.45	9000	300	11.8	0.002	0.45
1	0.2	0.9°	25	9500	610	24.0	0.008	0.45	8000	440	17.3	0.005	0.45	6000	320	12.6	0.004	0.45	4800	160	6.3	0.002	0.45
1	0.2	0.9°	30	4900	320	12.6	0.007	0.45	4100	220	8.7	0.004	0.45	3000	160	6.3	0.003	0.45	2500	80	3.1	0.002	0.45
1	0.2	0.9°	35	4000	260	10.2	0.006	0.45	3400	190	7.5	0.003	0.45	3000	160	6.3	0.003	0.45	2000	70	2.8	0.001	0.45
1	0.2	0.9°	40	3500	180	7.1	0.005	0.45	2900	130	5.1	0.003	0.45	2000	90	3.5	0.003	0.45	1700	50	2.0	0.001	0.45
1	0.2	0.9°	45	2900	150	5.9	0.004	0.45	2400	100	3.9	0.002	0.45	2000	90	3.5	0.002	0.45	1400	40	1.6	0.001	0.45
1	0.2	0.9°	50	2900	110	4.3	0.003	0.45	2400	80	3.1	0.002	0.45	2000	60	2.4	0.002	0.45	1400	30	1.2	0.001	0.45
1.5	0.3	0.9°	10	27000	5700	224.4	0.05	0.65	22000	4000	157.5	0.035	0.65	18000	3000	118.1	0.03	0.65	14000	1400	55.1	0.014	0.65
1.5	0.3	0.9°	15	22000	3200	126.0	0.03	0.65	18000	2300	90.6	0.025	0.65	15000	1700	66.9	0.018	0.65	11000	1000	39.4	0.009	0.65
1.5	0.3	0.9°	20	16000	1400	55.1	0.02	0.65	14000	1200	47.2	0.016	0.65	13000	1000	39.4	0.012	0.65	9000	700	27.6	0.007	0.65
1.5	0.3	0.9°	30	13000	900	35.4	0.01	0.65	11000	700	27.6	0.008	0.65	10000	600	23.6	0.006	0.65	7500	400	15.7	0.004	0.65
1.5	0.3	0.9°	40	4500	230	9.1	0.008	0.65	3700	160	6.3	0.007	0.65	3000	120	4.7	0.005	0.65	2300	70	2.8	0.003	0.65
1.5	0.3	0.9°	50	3700	190	7.5	0.007	0.65	3000	130	5.1	0.006	0.65	3000	120	4.7	0.004	0.65	1900	60	2.4	0.002	0.65
2	0.5	0.4°	15	20000	7000	275.6	0.05	0.75	17000	5000	196.9	0.04	0.75	13000	3200	126.0	0.03	0.75	10000	1800	70.9	0.016	0.75
2	0.5	0.4°	20	20000	3600	141.7	0.04	0.75	17000	2600	102.4	0.03	0.75	13000	1800	70.9	0.025	0.75	10000	900	35.4	0.012	0.75
2	0.5	0.4°	25	16000	1800	70.9	0.03	0.75	14000	1400	55.1	0.025	0.75	12000	1100	43.3	0.02	0.75	9000	720	28.3	0.01	0.75
2	0.5	0.4°	30	16000	1400	55.1	0.025	0.75	14000	1200	47.2	0.02	0.75	12000	900	35.4	0.016	0.75	9000	650	25.6	0.008	0.75
2	0.5	0.4°	35	13000	1100	43.3	0.02	0.75	11000	800	31.5	0.018	0.75	10000	700	27.6	0.014	0.75	7000	500	19.7	0.007	0.75
2	0.5	0.4°	40	13000	1000	39.4	0.02	0.75	11000	700	27.6	0.015	0.75	10000	600	23.6	0.012	0.75	7000	400	15.7	0.006	0.75
2	0.5	0.9°	20	20000	3600	141.7	0.04	0.75	17000	2600	102.4	0.03	0.75	13000	1800	70.9	0.025	0.75	10000	900	35.4	0.012	0.75
2	0.5	0.9°	25	16000	1800	70.9	0.03	0.75	14000	1400	55.1	0.025	0.75	12000	1100	43.3	0.02	0.75	9000	720	28.3	0.01	0.75
2	0.5	0.9°	30	16000	1400	55.1	0.025	0.75	14000	1200	47.2	0.02	0.75	12000	900	35.4	0.016	0.75	9000	650	25.6	0.008	0.75
2	0.5	0.9°	35	13000	1100	43.3	0.02	0.75	11000	800	31.5	0.018	0.75	10000	700	27.6	0.014	0.75	7000	500	19.7	0.007	0.75
2	0.5	0.9°	40	13000	1000	39.4	0.02	0.75	11000	700	27.6	0.015	0.75	10000	600	23.6	0.012	0.75	7000	400	15.7	0.006	0.75
2	0.5	0.9°	45	8000	500	19.7	0.016	0.75	6800	360	14.2	0.012	0.75	5200	250	9.8	0.01	0.75	4000	120	4.7	0.005	0.75
2	0.5	0.9°	50	8000	500	19.7	0.016	0.75	6800	360	14.2	0.012	0.75	5200	250	9.8	0.01	0.75	4000	120	4.7	0.005	0.75
2	0.5	0.9°	55	4100	230	9.1	0.012	0.75	3500	170	6.7	0.009	0.75	2700	120	4.7	0.008	0.75	2000	60	2.4	0.004	0.75
2	0.5	0.9°	60	4100	230	9.1	0.012	0.75	3500	170	6.7	0.009	0.75	2700	120	4.7	0.008	0.75	2000	60	2.4	0.004	0.75
3	0.8	0.9°	20	13000	7200	283.5	0.19	1	11000	5100	200.8	0.15	1	8700	4000	157.5	0.11	1	6500	1800	70.9	0.06	1
3	0.8	0.9°	25	13000	7200	283.5	0.19	1	11000	5100	200.8	0.15	1	8700	4000	157.5	0.11	1	6500	1800	70.9	0.06	1
3	0.8	0.9°	30	13000	5700	224.4	0.12	1	11000	4000	157.5	0.09	1	8700	3000	118.1	0.07	1	6500	1400	55.1	0.04	1
3	0.8	0.9°	40	11000	3600	141.7	0.08	1	9100	2600	102.4	0.06	1	7400	2000	78.7	0.05	1	5500	1000	39.4	0.025	1
3	0.8	0.9°	50	8000	2600	102.4	0.07	1	6600	1800	70.9	0.05	1	5800	1500	59.1	0.04	1	4600	800	31.5	0.02	1
3	0.8	0.9°	60	7800	2480	97.6	0.06	1	6600	1740	68.5	0.05	1	5000	1250	49.2	0.04	1	3900	610	24.0	0.02	1
Depth of cut																								

1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) Air blow or oil mist is recommended for good chip evacuation.
3) For profile machining such as molds, machining conditions may differ considerably depending on the workpiece geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of a workpiece.
4) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VFHVRB

4 flute, Corner radius, Short cut length, Irregular helix flutes

Taper neck type

Work material				Carbon Steel, Cast Iron, Alloy Steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21					Hardened Steel (45−55HRC) AISI H13					Hardened Steel (55−62HRC) AISI D2				
DC (mm)	RE (mm)	BHTA	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap(mm)	Width of cut ae(mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap(mm)	Width of cut ae(mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap(mm)	Width of cut ae(mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap(mm)	Width of cut ae(mm)
4	1	0.4°	25	10000	9900	389.8	0.24	1.5	8300	7000	275.6	0.19	1.5	6700	5600	220.5	0.14	1.5	5000	2500	98.4	0.07	1.5
4	1	0.4°	30	10000	9900	389.8	0.24	1.5	8300	7000	275.6	0.19	1.5	6700	5600	220.5	0.14	1.5	5000	2500	98.4	0.07	1.5
4	1	0.4°	35	10000	9900	389.8	0.15	1.5	8300	7000	275.6	0.12	1.5	6700	5600	220.5	0.09	1.5	5000	2500	98.4	0.04	1.5
4	1	0.4°	40	10000	9900	389.8	0.15	1.5	8300	7000	275.6	0.12	1.5	6700	5600	220.5	0.09	1.5	5000	2500	98.4	0.04	1.5
4	1	0.4°	45	10000	9900	389.8	0.15	1.5	8300	7000	275.6	0.12	1.5	6700	5600	220.5	0.09	1.5	5000	2500	98.4	0.04	1.5
4	1	0.4°	50	8100	6300	248.0	0.14	1.5	6700	4420	174.0	0.11	1.5	5400	3500	137.8	0.08	1.5	4000	1600	63.0	0.04	1.5
4	1	0.9°	25	10000	9900	389.8	0.24	1.5	8300	7000	275.6	0.19	1.5	6700	5600	220.5	0.14	1.5	5000	2500	98.4	0.07	1.5
4	1	0.9°	30	10000	9900	389.8	0.15	1.5	8300	7000	275.6	0.12	1.5	6700	5600	220.5	0.09	1.5	5000	2500	98.4	0.04	1.5
4	1	0.9°	40	10000	9900	389.8	0.15	1.5	8300	7000	275.6	0.12	1.5	6700	5600	220.5	0.09	1.5	5000	2500	98.4	0.04	1.5
4	1	0.9°	50	8100	6300	248.0	0.14	1.5	6700	4420	174.0	0.11	1.5	5400	3500	137.8	0.08	1.5	4000	1600	63.0	0.04	1.5
4	1	0.9°	60	8100	6300	248.0	0.11	1.5	6700	4420	174.0	0.08	1.5	5400	3500	137.8	0.06	1.5	4000	1600	63.0	0.03	1.5
6	1.5	0.9°	40	6600	11000	433.1	0.4	2	5500	7600	299.2	0.32	2	4500	6100	240.2	0.24	2	3300	2700	106.3	0.12	2
6	1.5	0.9°	50	6600	11000	433.1	0.4	2	5500	7600	299.2	0.32	2	4500	6100	240.2	0.24	2	3300	2700	106.3	0.12	2
6	1.5	0.9°	60	6600	11000	433.1	0.25	2	5500	7600	299.2	0.2	2	4500	6100	240.2	0.15	2	3300	2700	106.3	0.08	2
6	1.5	0.9°	70	5400	8700	342.5	0.23	2	4400	6200	244.1	0.18	2	3600	5000	196.9	0.14	2	2700	2200	86.6	0.07	2
8	2	0.9°	60	5000	11000	433.1	0.48	3	4200	7600	299.2	0.37	3	3300	6100	240.2	0.29	3	2500	2700	106.3	0.14	3
8	2	0.9°	80	5000	11000	433.1	0.3	3	4200	7600	299.2	0.23	3	3300	6100	240.2	0.18	3	2500	2700	106.3	0.09	3
10	2	0.9°	80	4000	11000	433.1	0.48	4.5	3300	7600	299.2	0.37	4.5	2700	6100	240.2	0.29	4.5	2000	2700	106.3	0.14	4.5
10	2	0.9°	120	3200	8700	342.5	0.27	4.5	2700	6200	244.1	0.21	4.5	2100	5000	196.9	0.16	4.5	1600	2200	86.6	0.08	4.5
12	2	0.9°	80	3300	10000	393.7	0.72	6	2700	7100	279.5	0.56	6	2200	5600	220.5	0.36	6	1700	2500	98.4	0.18	6
12	2	0.9°	120	3300	10000	393.7	0.45	6	2700	7100	279.5	0.35	6	2200	5600	220.5	0.23	6	1700	2500	98.4	0.12	6
Depth of cut																									

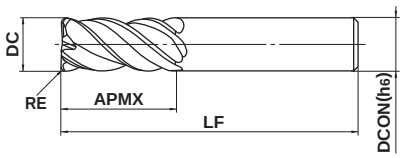
1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) Air blow or oil mist is recommended for good chip evacuation.
3) For profile machining such as molds, machining conditions may differ considerably depending on the workpiece geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of a workpiece.
4) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VFMHVRB

Corner radius end mill, Medium cut length, 4 flute, Irregular helix flutes

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○	○		◎	◎		





R					
0.5≤RE≤6.35					
±0.015					
DC≤12	DC>12				
0 - 0.02	0 - 0.03				
h6	DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
	0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

- Impact Miracle end mill with irregular helix flutes ensures stable machining of difficult-to-cut materials and applications requiring long overhangs.

Unit : mm

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMHVRBD0600R050	6	0.5	13	50	6	4	★	1
VFMHVRB**D0600R100**	6	1	13	50	6	4	★	1
VFMHVRB**D0800R050**	8	0.5	19	60	8	4	★	1
VFMHVRB**D0800R100**	8	1	19	60	8	4	★	1
VFMHVRB**D1000R050**	10	0.5	22	70	10	4	★	1
VFMHVRB**D1000R100**	10	1	22	70	10	4	★	1
VFMHVRB**D1000R200**	10	2	22	70	10	4	★	1
VFMHVRB**D1200R050**	12	0.5	26	75	12	4	★	1
VFMHVRB**D1200R100**	12	1	26	75	12	4	★	1
VFMHVRB**D1200R200**	12	2	26	75	12	4	★	1
VFMHVRB**D1600R100**	16	1	35	90	16	4	★	1
VFMHVRB**D1600R200**	16	2	35	90	16	4	★	1
VFMHVRB**D1600R300**	16	3	35	90	16	4	★	1
VFMHVRB**D1600R500**	16	5	35	90	16	4	★	1
VFMHVRB**D2000R100**	20	1	45	110	20	4	★	1
VFMHVRB**D2000R200**	20	2	45	110	20	4	★	1
VFMHVRB**D2000R300**	20	3	45	110	20	4	★	1
VFMHVRB**D2000R400**	20	4	45	110	20	4	★	1
VFMHVRB**D2000R500**	20	5	45	110	20	4	★	1
VFMHVRB**D2000R635**	20	6.35	45	110	20	4	★	1

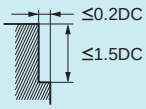
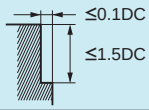
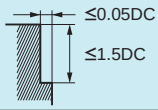
★ : Inventory maintained in Japan.

VFMHVRB

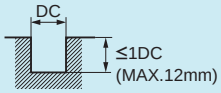
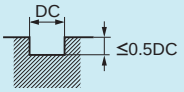
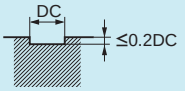
Corner radius end mill, Medium cut length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45—55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
2	21000	1100	43.3	21000	1100	43.3	14000	560	22.0	9600	310	12.2	4800	130	5.1
3	15000	1250	49.2	15000	1250	49.2	10600	850	33.5	7400	380	15.0	4200	200	7.9
4	11000	1400	55.1	11000	1400	55.1	8000	960	37.8	5600	400	15.7	3200	220	8.7
5	9600	1920	75.6	9600	1920	75.6	6400	1020	40.2	4500	430	16.9	2500	250	9.8
6	8000	2240	88.2	8000	2240	88.2	5300	1060	41.7	3700	440	17.3	2100	250	9.8
7	6800	1900	74.8	6800	1900	74.8	4500	1010	39.8	3200	450	17.7	1800	260	10.2
8	6000	1680	66.1	6000	1680	66.1	4000	960	37.8	2800	450	17.7	1600	260	10.2
9	5300	1480	58.3	5300	1480	58.3	3500	840	33.1	2500	450	17.7	1400	220	8.7
10	4800	1440	56.7	4800	1440	56.7	3200	770	30.3	2200	440	17.3	1300	210	8.3
11	4400	1350	53.1	4400	1350	53.1	2900	760	29.9	2000	400	15.7	1200	190	7.5
12	4000	1250	49.2	4000	1250	49.2	2700	760	29.9	1900	380	15.0	1100	180	7.1
13	3700	1180	46.5	3700	1180	46.5	2500	700	27.6	1700	360	14.2	1000	160	6.3
14	3400	1160	45.7	3400	1160	45.7	2300	640	25.2	1600	350	13.8	900	140	5.5
16	3000	1140	44.9	3000	1140	44.9	2000	560	22.0	1400	340	13.4	800	130	5.1
18	2700	970	38.2	2700	970	38.2	1800	550	21.7	1200	340	13.4	700	110	4.3
20	2400	860	33.9	2400	860	33.9	1600	510	20.1	1100	330	13.0	600	100	3.9
Depth of cut	 ≤0.2DC ≤1.5DC						 ≤0.1DC ≤1.5DC			 ≤0.05DC ≤1.5DC					

Slotting

Work material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45—55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
2	17000	680	26.8	10000	400	15.7	9600	310	12.2	4800	130	5.1	3200	80	3.1
3	12000	720	28.3	6900	410	16.1	7400	380	15.0	3200	140	5.5	2700	110	4.3
4	9200	810	31.9	5600	490	19.3	5600	400	15.7	2400	150	5.9	2000	120	4.7
5	7600	1060	41.7	4500	630	24.8	4500	410	16.1	1900	170	6.7	1600	130	5.1
6	6400	1280	50.4	3700	740	29.1	3700	440	17.3	1600	190	7.5	1300	160	6.3
7	5500	1210	47.6	3200	700	27.6	3200	410	16.1	1400	190	7.5	1100	140	5.5
8	4800	1150	45.3	2800	670	26.4	2800	390	15.4	1200	190	7.5	1000	130	5.1
9	4200	1010	39.8	2500	600	23.6	2500	350	13.8	1100	180	7.1	900	130	5.1
10	3800	910	35.8	2200	530	20.9	2200	350	13.8	1000	160	6.3	800	130	5.1
11	3500	900	35.4	2000	530	20.9	2000	320	12.6	900	160	6.3	720	120	4.7
12	3200	900	35.4	1900	530	20.9	1900	300	11.8	800	160	6.3	660	110	4.3
13	2900	810	31.9	1700	480	18.9	1700	290	11.4	730	150	5.9	610	100	3.9
14	2700	760	29.9	1600	450	17.7	1600	290	11.4	680	140	5.5	570	90	3.5
16	2400	670	26.4	1400	390	15.4	1400	280	11.0	600	120	4.7	500	80	3.1
18	2100	670	26.4	1200	380	15.0	1200	270	10.6	530	120	4.7	440	70	2.8
20	1900	610	24.0	1100	350	13.8	1100	260	10.2	480	120	4.7	400	60	2.4
Depth of cut	 DC ≤1DC (MAX.12mm)						 DC ≤0.5DC			 DC ≤0.2DC					

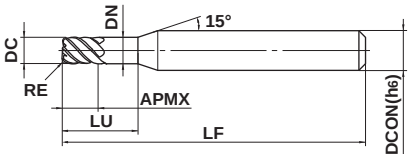
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VFSDRB NEW

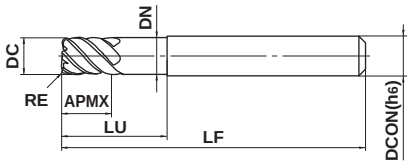
IMPACT MIRACLE Corner radius end mill, 6 flute (S)

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				





Type 1



Type 2

h6

3≤DC≤12				
0 - 0.02				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

● 6 flute end mill with Impact Miracle coating for high hardened materials.

Unit : mm

Order Number	DC	RE	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VFSDRBD0300R030	3	0.3	3	9	2.9	45	6	6	●	1
VFSDRB**D0400R030**	4	0.3	4	12	3.9	45	6	6	●	1
VFSDRB**D0500R030**	5	0.3	5	15	4.9	50	6	6	●	1
VFSDRB**D0600R030**	6	0.3	6	18	5.85	50	6	6	●	2
VFSDRB**D0600R050**	6	0.5	6	18	5.85	50	6	6	●	2
VFSDRB**D0600R100**	6	1	6	18	5.85	50	6	6	●	2
VFSDRB**D0800R030**	8	0.3	8	24	7.85	60	8	6	●	2
VFSDRB**D0800R050**	8	0.5	8	24	7.85	60	8	6	●	2
VFSDRB**D0800R100**	8	1	8	24	7.85	60	8	6	●	2
VFSDRB**D1000R050**	10	0.5	10	30	9.7	70	10	6	●	2
VFSDRB**D1000R100**	10	1	10	30	9.7	70	10	6	●	2
VFSDRB**D1200R050**	12	0.5	12	36	11.7	75	12	6	●	2
VFSDRB**D1200R100**	12	1	12	36	11.7	75	12	6	●	2

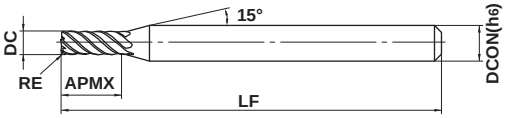
● : Inventory maintained.

VFMDRB NEW

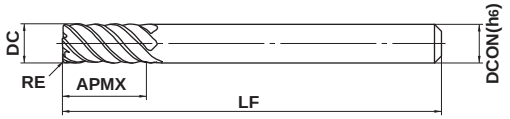
Corner radius, Medium cut length, 6 flute, For hardened materials

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				

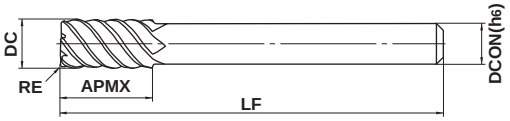




Type 1



Type 2



Type 3

h6

DC≤12	DC>12			
0 - 0.02	0 - 0.03			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

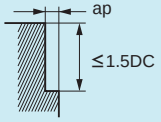
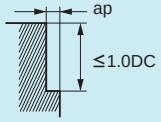
● 6 flute corner radius end mill with Impact Miracle coating for high hardened materials.

Unit : mm

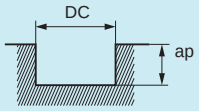
Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMDRBD0300R030	3	0.3	10	60	6	6	●	1
VFMDRB**D0400R030**	4	0.3	12	60	6	6	●	1
VFMDRB**D0500R030**	5	0.3	15	60	6	6	●	1
VFMDRB**D0600R030**	6	0.3	15	60	6	6	●	2
VFMDRB**D0600R050**	6	0.5	15	60	6	6	●	2
VFMDRB**D0600R100**	6	1	15	60	6	6	●	2
VFMDRB**D0800R030**	8	0.3	20	75	8	6	●	2
VFMDRB**D0800R050**	8	0.5	20	75	8	6	●	2
VFMDRB**D0800R100**	8	1	20	75	8	6	●	2
VFMDRB**D1000R030**	10	0.3	25	80	10	6	●	2
VFMDRB**D1000R050**	10	0.5	25	80	10	6	●	2
VFMDRB**D1000R100**	10	1	25	80	10	6	●	2
VFMDRB**D1200R050**	12	0.5	30	100	12	6	●	2
VFMDRB**D1200R100**	12	1	30	100	12	6	●	2
VFMDRB**D1600R100**	16	1	40	110	16	6	★	2
VFMDRB**D1600R150**	16	1.5	40	110	16	6	★	2
VFMDRB**D1800R100**	18	1	40	120	16	6	★	3
VFMDRB**D1800R150**	18	1.5	40	120	16	6	★	3
VFMDRB**D2000R100**	20	1	45	125	20	6	★	2
VFMDRB**D2000R150**	20	1.5	45	125	20	6	★	2
VFMDRB**D2000R200**	20	2	45	125	20	6	★	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Work material	Hardened steel (45−55HRC) AISI H13 etc.				Hardened steel (55−62HRC) AISI D2 etc.				Hardened steel (62−70HRC) AISI W1, AISI M2 etc.			
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
1	40000	1200	47.2	0.05	40000	800	31.5	0.03	32000	500	19.7	0.02
2	40000	2000	78.7	0.1	24000	1000	39.4	0.05	16000	600	23.6	0.05
3	32000	3800	149.6	0.2	16000	1900	74.8	0.1	11000	1200	47.2	0.05
4	24000	4400	173.2	0.2	12000	2200	86.6	0.1	8000	1300	51.2	0.05
6	16000	5800	228.3	0.3	8000	2900	114.2	0.2	5300	1800	70.9	0.1
8	12000	5800	228.3	0.4	6000	2900	114.2	0.2	4000	1800	70.9	0.1
10	9600	5800	228.3	0.5	4800	2900	114.2	0.3	3200	1800	70.9	0.2
12	8000	4800	189.0	0.6	4000	2400	94.5	0.3	2700	1500	59.1	0.2
16	6000	3600	141.7	0.8	3000	1800	70.9	0.5	2000	1100	43.3	0.3
20	4800	2900	114.2	1.0	2400	1400	55.1	0.5	1600	880	34.6	0.3
25	3800	2300	90.6	1.0	1900	1100	43.3	0.5	1300	720	28.3	0.3
Depth of cut												

Slot milling with small diameter tools

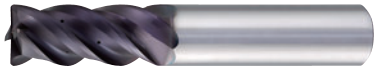
Work material	Hardened steel (45−55HRC) AISI H13 etc.				Hardened steel (55−62HRC) AISI D2 etc.			
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
1	15000	300	11.8	0.1	9500	110	4.3	0.05
2	8000	320	12.6	0.2	4800	190	7.5	0.1
Depth of cut								

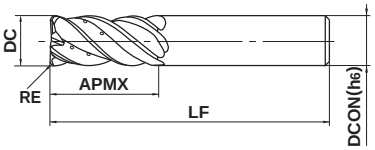
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VFMHVRBCH

Corner radius end mill, Medium cut length, 4 flute,
Irregular helix flutes, with multiple internal through coolant holes

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
				◎	◎		





Type1

R					
	1<RE<3				
	±0.015				
	16≤DC≤20				
	0 - 0.03				
h6	DCON=16	DCON=20			
	0 - 0.011	0 - 0.013			

● Vibration control corner radius end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

Unit : mm

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMHVRBCHD1600R100	16	1	35	90	16	4	★	1
VFMHVRBCH**D1600R300**	16	3	35	90	16	4	★	1
VFMHVRBCH**D2000R100**	20	1	45	110	20	4	★	1
VFMHVRBCH**D2000R300**	20	3	45	110	20	4	★	1

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)
16	2000	560	22.0	800	110	4.3
20	1600	510	20.1	600	100	3.9
Depth of cut	≤0.1DC 0.5DC—1.5DC			≤0.05DC 0.5DC—1.5DC		

Slotting

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.		
DC (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)
16	1400	170	6.7
20	1100	130	5.1
Depth of cut	DC 0.5DC—1.5DC		

1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.
3) For shoulder milling, climb cutting is recommended.

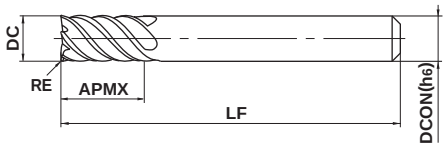
★ : Inventory maintained in Japan.

VF6MHVRB

Corner radius end mill, Medium cut length, 6 flute, Irregular helix flutes

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○	○		◎	◎		





Type1

R					
0.5≤RE≤2					
±0.015					
DC≤12	DC>12				
0 - 0.020	0 - 0.030				
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20		
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013		

- Irregular helix 6 flute geometry reduces vibrations and achieves high efficiency machining.
- Suitable for machining of difficult-to-cut materials such as stainless steel, titanium alloy and inconel.

Unit : mm

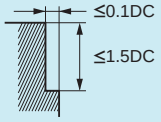
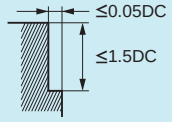
Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VF6MHVRBD0600R050	6	0.5	13	50	6	6	★	1
VF6MHVRB**D0600R100**	6	1	13	50	6	6	★	1
VF6MHVRB**D0800R050**	8	0.5	19	60	8	6	★	1
VF6MHVRB**D0800R100**	8	1	19	60	8	6	★	1
VF6MHVRB**D1000R050**	10	0.5	22	70	10	6	★	1
VF6MHVRB**D1000R100**	10	1	22	70	10	6	★	1
VF6MHVRB**D1200R050**	12	0.5	26	75	12	6	★	1
VF6MHVRB**D1200R100**	12	1	26	75	12	6	★	1
VF6MHVRB**D1600R100**	16	1	32	90	16	6	★	1
VF6MHVRB**D1600R200**	16	2	32	90	16	6	★	1
VF6MHVRB**D2000R100**	20	1	38	100	20	6	★	1
VF6MHVRB**D2000R200**	20	2	38	100	20	6	★	1

VF6MHVRB

Corner radius, Medium cut length, 6 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

Side milling

Work material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
6	10600	2900	114.2	8000	2000	78.7	2100	320	12.6
8	8000	2900	114.2	6000	2000	78.7	1600	300	11.8
10	6400	2700	106.3	4800	2000	78.7	1300	260	10.2
12	5300	2700	106.3	4000	2000	78.7	1100	230	9.1
16	4000	2200	86.6	3000	1600	63.0	800	180	7.1
20	3200	1900	74.8	2400	1400	55.1	640	150	5.9
Depth of cut									

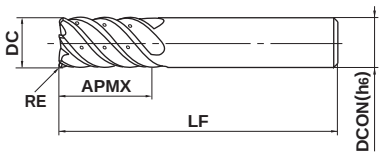
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VF6MHVRBCH

Corner radius end mill, Medium cut length, 6 flute,
Irregular helix flutes, with multiple internal through coolant holes

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
				◎	◎		





Type 1

R					
0.5≤RE≤3					
±0.015					
DC≤12	DC>12				
0 - 0.02	0 - 0.03				
h6	DCON=10	DCON=12	DCON=16	DCON=20	
	0 - 0.009	0 - 0.011	0 - 0.011	0 - 0.013	

● Vibration control corner radius end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

Unit : mm

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VF6MHVRBCHD1000R050	10	0.5	22	70	10	6	●	1
VF6MHVRBCH**D1000R100**	10	1	22	70	10	6	●	1
VF6MHVRBCH**D1200R050**	12	0.5	26	75	12	6	●	1
VF6MHVRBCH**D1200R100**	12	1	26	75	12	6	●	1
VF6MHVRBCH**D1600R100**	16	1	32	90	16	6	★	1
VF6MHVRBCH**D1600R300**	16	3	32	90	16	6	★	1
VF6MHVRBCH**D2000R100**	20	1	38	100	20	6	★	1
VF6MHVRBCH**D2000R300**	20	3	38	100	20	6	★	1

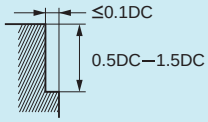
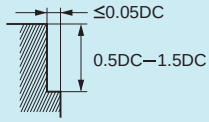
● : Inventory maintained. ★ : Inventory maintained in Japan.

VF6MHVRBCH

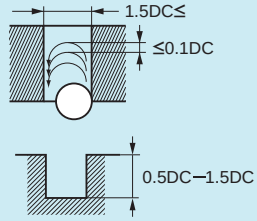
Corner radius end mill, Medium cut length, 6 flute, Irregular helix flutes, with multiple internal through coolant holes

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
10	4800	2000	78.7	1300	260	10.2
12	4000	2000	78.7	1100	230	9.1
16	3000	1600	63.0	800	180	7.1
20	2400	1400	55.1	640	150	5.9
Depth of cut						

Trochoidal milling

Work material	Austenitic Stainless Steel Titanium alloy AISI 304, AISI 316, Ti-6Al-4V etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
10	4800	1400	55.1
12	4000	1200	47.2
16	3000	1100	43.3
20	2400	900	35.4
Depth of cut			

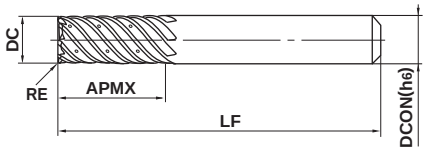
1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately.
3) Climb cutting is recommended.

VF8MHVRBCH

Corner radius end mill, Medium cut length, 8 flute,
Irregular helix flutes, with multiple internal through coolant holes

Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
				◎	◎		





Type1

R	1≤RE≤3				
	±0.015				
	0 - 0.03				
h6	DCON=16	DCON=20			
	0 - 0.011	0 - 0.013			

- Vibration control 8 flute corner radius end mill with multiple internal through coolant holes ensures efficient side finishing of difficult-to-cut materials such as stainless steels, titanium and inconel alloys.

Unit : mm

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VF8MHVRBCHD1600R100	16	1	32	90	16	8	★	1
VF8MHVRBCH**D1600R300**	16	3	32	90	16	8	★	1
VF8MHVRBCH**D2000R100**	20	1	38	100	20	8	★	1
VF8MHVRBCH**D2000R300**	20	3	38	100	20	8	★	1

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	3000	2100	82.7	800	240	9.4
20	2400	1900	74.8	640	200	7.9
Depth of cut	≤0.08DC 0.5DC–1.5DC			≤0.05DC 0.5DC–1.5DC		

Trochoidal milling

Work material	Austenitic Stainless Steel Titanium alloy AISI 304, AISI 316, Ti-6Al-4V etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	3000	1400	55.1
20	2400	1200	47.2
Depth of cut	1.5DC≤ ≤0.08DC 0.5DC–1.5DC		

1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately.
3) For shoulder milling, climb cutting is recommended.

★ : Inventory maintained in Japan.

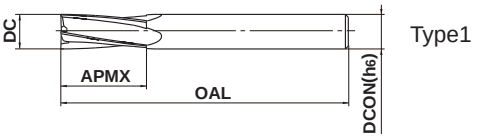
DFC4JC

End mill, Semi long cutting length, 4 flute, For CFRP

CFRP

◎





Type1

6≤DC≤12				
0 - 0.03				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

h6

● 4 flute end mill with original CVD diamond coating for CFRP machining.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DFC4JCD0600	6	20	70	6	4	●	1
DFC4JCD0800	8	30	80	8	4	●	1
DFC4JCD1000	10	30	90	10	4	●	1
DFC4JCD1200	12	30	100	12	4	●	1

Note) Please contact Mitsubishi Materials for geometries and through coolant types that are non-standard.

RECOMMENDED CUTTING CONDITIONS

Work material	CFRP		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
6	11000	950	37.4
8	8000	780	30.7
10	6400	700	27.6
12	5300	650	25.6

1) Cutting conditions may differ considerably due to the kind of CFRP, the rigidity of the machine, or the clamping and geometry of the workpiece. Please use the above table as a guideline.
2) When high machining accuracy is needed or if large burrs or delamination occur, we recommend reducing the feed rate.
3) When the depth of cut is greater than 0.8DC, we recommend reducing the feed rate.
4) Please take precautions against dust.

● : Inventory maintained.

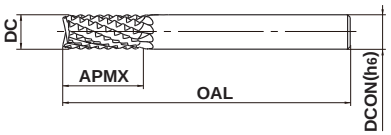
DFCJRT

Cross-nick type end mill , Semi long cutting length, For CFRP

CFRP

◎





Type1

h6	DCON=6	8≦DCON≦10	DCON=12		
	0 - 0.008	0 - 0.009	0 - 0.011		

● Cross-nick type end mill with original CVD diamond coating for CFRP machining.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DFCJRTD0600	6	20	70	6	10	●	1
DFCJRT**D0800**	8	30	80	8	10	●	1
DFCJRT**D1000**	10	30	90	10	12	●	1
DFCJRT**D1200**	12	30	100	12	12	●	1

Note) Please contact Mitsubishi Materials for geometries and through coolant types that are non-standard.

RECOMMENDED CUTTING CONDITIONS

Work material	CFRP		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
6	11000	1200	47.2
8	8000	1000	39.4
10	6400	900	35.4
12	5300	850	33.4

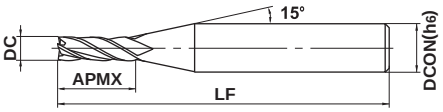
1) Cutting conditions may differ considerably due to the kind of CFRP, the rigidity of the machine, or the clamping and geometry of the workpiece. Please use the above table as a guideline.
2) When high machining accuracy is needed or if large burrs or delamination occur, we recommend reducing the feed rate.
3) When the depth of cut is greater than 0.8DC, we recommend reducing the feed rate.
4) Please take precautions against dust.

DF4JC

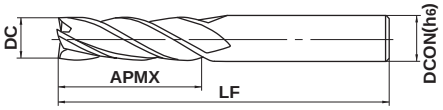
End mill, Semi long cut length, 4 flute, For graphite

Aluminum Alloy	Copper	Graphite	GFRP CFRP	Machineable Ceramics
○	◎	◎	○	○





Type1



Type2

3≤DC≤12				
0 - 0.02				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

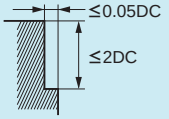
h6

● 4 flute end mill with original diamond coating for graphite machining.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DF4JCD0300	3	12	60	6	4	★	1
DF4JCD0400	4	16	60	6	4	★	1
DF4JCD0600	6	24	60	6	4	★	2
DF4JCD0800	8	28	70	8	4	★	2
DF4JCD1000	10	35	90	10	4	★	2
DF4JCD1200	12	36	110	12	4	★	2

RECOMMENDED CUTTING CONDITIONS

Work material	Graphite					Copper, Copper alloys				
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Width of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Width of cut (mm)
3	22000	2500	98.4	6	0.15	10600	280	11.0	6	0.15
4	18000	2900	114.2	8	0.2	8000	330	13.0	8	0.2
6	14000	3200	126.0	12	0.3	6400	380	15.0	12	0.3
8	10500	2900	114.2	16	0.4	4000	420	16.5	16	0.4
10	8700	2600	102.4	20	0.5	3200	460	18.1	20	0.5
12	7200	2200	86.6	24	0.6	2700	460	18.1	24	0.6
Depth of cut										

1) When high machining accuracy is needed, or work piece becomes chipped, we recommend lowering feed rate.
2) Use a milling machine dedicated for graphite.
3) If rigidity of machine or work materials installation is very low, or chattering and noise are generated, reduce revolution and feed rate proportionately.

★ : Inventory maintained in Japan.

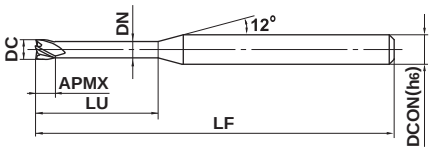
DF4XL

End mill, Long neck, 4 flute, For graphite

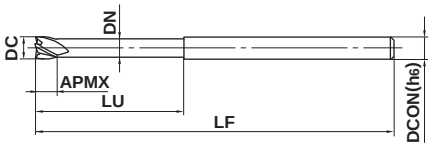
UWC DF 30° DC<3 DC≥3

Aluminum Alloy	Copper	Graphite	GFRP CFRP	Machineable Ceramics
○	◎	◎	○	○





Type1



Type2

h6

1≤DC≤12				
0 - 0.02				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

● 4 flute long neck end mill with original diamond coating for graphite machining.

Unit : mm

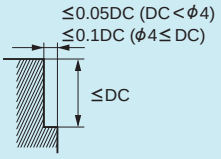
Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
DF4XLD0100N060	1	1.5	6	0.94	50	4	4	★	1
DF4XL**D0100N080**	1	1.5	8	0.94	50	4	4	★	1
DF4XL**D0100N100**	1	1.5	10	0.94	50	4	4	★	1
DF4XL**D0150N100**	1.5	2.3	10	1.44	60	4	4	★	1
DF4XL**D0150N160**	1.5	2.3	16	1.44	60	4	4	★	1
DF4XL**D0200N100**	2	3	10	1.9	60	4	4	★	1
DF4XL**D0200N160**	2	3	16	1.9	60	4	4	★	1
DF4XL**D0200N200**	2	3	20	1.9	60	4	4	★	1
DF4XL**D0300N160**	3	4.5	16	2.9	70	4	4	★	1
DF4XL**D0300N200**	3	4.5	20	2.9	70	4	4	★	1
DF4XL**D0300N300**	3	4.5	30	2.9	70	4	4	★	1
DF4XL**D0400N200**	4	6	20	3.9	80	4	4	★	2
DF4XL**D0400N400**	4	6	40	3.9	80	4	4	★	2
DF4XL**D0600N300**	6	9	30	5.85	70	6	4	★	2
DF4XL**D0800N300**	8	12	30	7.85	90	8	4	★	2
DF4XL**D1000N300**	10	15	30	9.7	90	10	4	★	2
DF4XL**D1200N300**	12	18	30	11.7	110	12	4	★	2

DF4XL

End mill, Long neck, 4 flute, For graphite

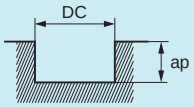
RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material		Graphite					Copper, Copper alloys				
DC (mm)	**LU** (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Width of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Width of cut (mm)
1	6	30000	1300	51.2	1	0.05	30000	1300	51.2	1	0.05
	8	25000	1000	39.4	1	0.05	25000	1000	39.4	1	0.05
	10	22000	700	27.6	1	0.05	22000	700	27.6	1	0.05
1.5	10	25000	1200	47.2	2	0.075	21000	1000	39.4	1.5	0.075
	16	18000	800	31.5	1.5	0.075	18000	800	31.5	1.5	0.075
2	10	22000	1500	59.1	2	0.1	16000	1100	43.3	2	0.1
	16	19000	1100	43.3	2	0.1	16000	930	36.6	2	0.1
	20	16000	800	31.5	2	0.1	16000	800	31.5	2	0.1
3	16	21000	1900	74.8	3	0.15	10600	960	37.8	3	0.15
	20	18000	1500	59.1	3	0.15	10600	890	35.0	3	0.15
	30	14000	1000	39.4	3	0.15	10600	760	29.9	3	0.15
4	20	18000	2400	94.5	4	0.4	8000	1100	43.3	4	0.4
	40	13000	1500	59.1	4	0.4	8000	920	36.2	4	0.4
6	30	14000	3200	126.0	6	0.6	5300	1200	47.2	6	0.6
8	30	10500	2900	114.2	8	0.8	4000	1100	43.3	8	0.8
10	30	8700	2600	102.4	10	1.0	3200	960	37.8	10	1.0
12	30	7200	2200	86.6	12	1.2	2650	800	31.5	12	1.2
Depth of cut											

1) When high machining accuracy is needed, or work piece becomes chipped, we recommend lowering feed rate.
2) Use a milling machine dedicated for graphite.
3) If rigidity of machine or work materials installation is very low, or chattering and noise are generated, reduce revolution and feed rate proportionately.

Slotting

Work material		Graphite				Copper, Copper alloys			
DC (mm)	**LU** (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
1	6	30000	1000	39.4	0.1	30000	980	38.6	0.1
	8	25000	700	27.6	0.08	25000	700	27.6	0.08
	10	22000	500	19.7	0.06	22000	500	19.7	0.06
1.5	10	25000	1100	43.3	0.14	21000	750	29.5	0.14
	16	18000	600	23.6	0.1	18000	600	23.6	0.1
2	10	22000	1200	47.2	0.2	16000	820	32.3	0.2
	16	19000	800	31.5	0.16	16000	700	27.6	0.16
	20	16000	600	23.6	0.12	16000	600	23.6	0.12
3	16	21000	1400	55.1	0.3	10600	720	28.3	0.3
	20	18000	1100	43.3	0.25	10600	670	26.4	0.25
	30	14000	700	27.6	0.2	10600	570	22.4	0.2
4	20	18000	1800	70.9	0.5	8000	820	32.3	0.5
	40	13000	900	35.4	0.4	8000	690	27.2	0.4
6	30	14000	2300	90.6	1.2	5300	900	35.4	1.2
8	30	10500	2000	78.7	2.0	4000	820	32.3	2.0
10	30	8700	1900	74.8	3.0	3200	720	28.3	3.0
12	30	7200	1700	66.9	4.0	2650	600	23.6	4.0
Depth of cut									

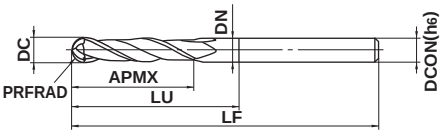
1) When high machining accuracy is needed, or work piece becomes chipped, we recommend lowering feed rate.
2) Use a milling machine dedicated for graphite.
3) If rigidity of machine or work materials installation is very low, or chattering and noise are generated, reduce revolution and feed rate proportionately.

DF2MB

Ball nose, Medium cut length, 2 flute, For graphite

Aluminum Alloy	Copper	Graphite	GFRP CFRP	Machineable Ceramics
○	◎	◎	○	○





Type1

R					
	3≤PRFRAD≤6				
	±0.01				
h6	DCON=6	8≤DCON≤10	DCON=12		
	0 - 0.008	0 - 0.009	0 - 0.011		

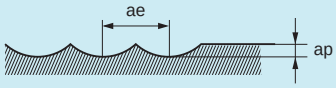
● 2 flute ball nose end mill with original diamond coating for graphite machining.

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
DF2MBR0300A100	3	6	30	50	5.85	100	6	2	★	1
DF2MB**R0300A150**	3	6	30	50	5.85	150	6	2	★	1
DF2MB**R0400A110**	4	8	40	60	7.85	110	8	2	★	1
DF2MB**R0400A150**	4	8	40	60	7.85	150	8	2	★	1
DF2MB**R0500A120**	5	10	50	70	9.7	120	10	2	★	1
DF2MB**R0500A180**	5	10	50	70	9.7	180	10	2	★	1
DF2MB**R0600A130**	6	12	55	75	11.7	130	12	2	★	1
DF2MB**R0600A200**	6	12	55	75	11.7	200	12	2	★	1

★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Work material		Graphite					Copper, Copper alloys				
PRFRAD (mm)	**LF** (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Width of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Width of cut (mm)
R3	100	16000	1900	74.8	0.6	1.5	16000	1500	59.1	0.6	1.5
	150	12000	1200	47.2	0.4	1.2	12000	960	37.8	0.4	1.2
R4	110	12000	2000	78.7	0.8	2.0	12000	1600	63	0.8	2.0
	150	9200	1400	55.1	0.6	1.6	9200	1100	43.3	0.6	1.6
R5	120	9500	2200	86.6	1.0	2.5	9500	1800	70.9	1.0	2.5
	180	7300	1500	59.1	0.8	2.0	7300	1200	47.2	0.8	2.0
R6	130	8000	1800	70.9	1.2	3.0	8000	1400	55.1	1.2	3.0
	200	6100	1200	47.2	1.0	2.5	6100	960	37.8	1.0	2.5
Depth of cut											

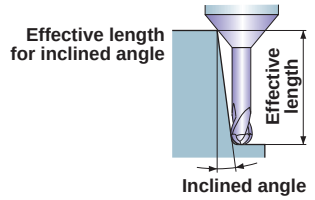
1) When high machining accuracy is needed, or work piece becomes chipped, we recommend lowering feed rate.
2) Use a milling machine dedicated for graphite.
3) If rigidity of machine or work materials installation is very low, or chattering and noise are generated, reduce revolution and feed rate proportionately.

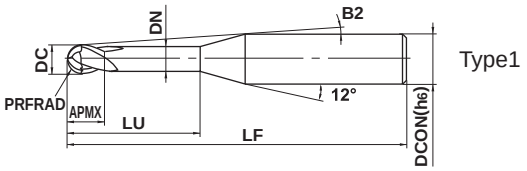
DF2XLB

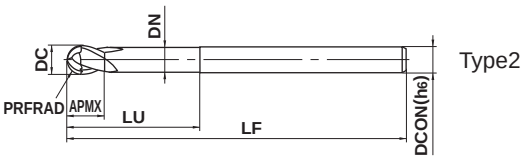
Ball nose, Medium cut length, 2 flute, Long neck, For graphite

Aluminum Alloy	Copper	Graphite	GFRP CFRP	Machineable Ceramics
○	◎	◎	○	○









R	0.1≤PRFRAD≤3		
	±0.01		
h6	DCON=4,6		
	0 - 0.008		

● 2 flute long neck ball nose end mill with original diamond coating for graphite machining.

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
DF2XLBR0010N005	0.1	0.2	0.2	0.5	0.18	11.5°	50	4	2	★	1	0.5	0.5	0.6	0.7
DF2XLB**R0015N020**	0.15	0.3	0.3	2	0.27	9.9°	50	4	2	★	1	2.1	2.2	2.4	2.6
DF2XLB**R0015N030**	0.15	0.3	0.3	3	0.27	9.1°	50	4	2	★	1	3.1	3.2	3.6	3.9
DF2XLB**R0020N010**	0.2	0.4	0.6	1	0.36	11.0°	50	4	2	★	1	1.0	1.0	1.1	1.2
DF2XLB**R0020N020**	0.2	0.4	0.6	2	0.36	10.0°	50	4	2	★	1	2.0	2.1	2.3	2.6
DF2XLB**R0020N030**	0.2	0.4	0.6	3	0.36	9.1°	50	4	2	★	1	3.1	3.2	3.5	3.9
DF2XLB**R0020N040**	0.2	0.4	0.6	4	0.36	8.4°	60	4	2	★	1	4.1	4.3	4.7	5.2
DF2XLB**R0020N080**	0.2	0.4	0.6	8	0.36	6.4°	60	4	2	★	1	8.3	8.7	9.5	10.5
DF2XLB**R0020N120**	0.2	0.4	0.6	12	0.36	5.1°	60	4	2	★	1	12.5	13.0	14.3	15.8
DF2XLB**R0025N040**	0.25	0.5	0.6	4	0.46	8.3°	60	4	2	★	1	4.1	4.3	4.7	5.2
DF2XLB**R0025N050**	0.25	0.5	0.6	5	0.46	7.7°	60	4	2	★	1	5.2	5.4	5.9	6.5
DF2XLB**R0025N080**	0.25	0.5	0.6	8	0.46	6.3°	60	4	2	★	1	8.3	8.7	9.5	10.5
DF2XLB**R0030N020**	0.3	0.6	0.9	2	0.56	9.9°	60	4	2	★	1	2.1	2.2	2.4	2.6
DF2XLB**R0030N040**	0.3	0.6	0.9	4	0.56	8.3°	60	4	2	★	1	4.2	4.4	4.8	5.2
DF2XLB**R0030N050**	0.3	0.6	0.9	5	0.56	7.6°	60	4	2	★	1	5.2	5.4	6.0	6.6
DF2XLB**R0030N060**	0.3	0.6	0.9	6	0.56	7.1°	60	4	2	★	1	6.3	6.5	7.1	7.9
DF2XLB**R0030N080**	0.3	0.6	0.9	8	0.56	6.2°	60	4	2	★	1	8.3	8.7	9.5	10.6
DF2XLB**R0030N100**	0.3	0.6	0.9	10	0.56	5.5°	60	4	2	★	1	10.4	10.9	11.9	13.2
DF2XLB**R0030N160**	0.3	0.6	0.9	16	0.56	4.1°	60	4	2	★	1	16.7	17.4	19.1	21.2
DF2XLB**R0040N060**	0.4	0.8	1.2	6	0.76	7.0°	60	4	2	★	1	6.3	6.5	7.1	7.9
DF2XLB**R0040N080**	0.4	0.8	1.2	8	0.76	6.1°	60	4	2	★	1	8.3	8.7	9.5	10.5
DF2XLB**R0050N040**	0.5	1	1.5	4	0.94	8.0°	60	4	2	★	1	4.2	4.4	4.8	5.3
DF2XLB**R0050N060**	0.5	1	1.5	6	0.94	6.8°	60	4	2	★	1	6.3	6.6	7.2	8.0
DF2XLB**R0050N080**	0.5	1	1.5	8	0.94	5.9°	60	4	2	★	1	8.4	8.8	9.6	10.6
DF2XLB**R0050N100**	0.5	1	1.5	10	0.94	5.2°	60	4	2	★	1	10.5	11.0	12.0	13.3
DF2XLB**R0050N120**	0.5	1	1.5	12	0.94	4.6°	60	4	2	★	1	12.6	13.2	14.4	15.9
DF2XLB**R0050N200**	0.5	1	1.5	20	0.94	3.3°	80	4	2	★	1	21.0	21.9	24.0	26.6
DF2XLB**R0050N300**	0.5	1	1.5	30	0.94	2.4°	80	4	2	★	1	31.4	32.8	36.0	⋆
DF2XLB**R0050N400**	0.5	1	1.5	40	0.94	1.9°	80	4	2	★	1	41.8	43.7	⋆	⋆
DF2XLB**R0075N080**	0.75	1.5	2.3	8	1.44	5.4°	60	4	2	★	1	8.4	8.8	9.6	10.6
DF2XLB**R0075N100**	0.75	1.5	2.3	10	1.44	4.7°	60	4	2	★	1	10.5	11.0	12.0	13.2

⋆ No interference

★ : Inventory maintained in Japan.

Unit : mm

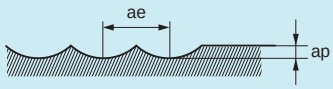
Order Number	PRFRAD	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												30'	1°	2°	3°
DF2XLBR0075N160	0.75	1.5	2.3	16	1.44	3.4°	80	4	2	★	1	16.8	17.5	19.2	21.2
DF2XLB**R0075N300**	0.75	1.5	2.3	30	1.44	2.1°	80	4	2	★	1	31.4	32.8	35.9	*
DF2XLB**R0100N080**	1	2	3	8	1.9	4.9°	60	4	2	★	1	8.3	8.7	9.4	10.4
DF2XLB**R0100N100**	1	2	3	10	1.9	4.2°	60	4	2	★	1	10.4	10.9	11.8	13.0
DF2XLB**R0100N120**	1	2	3	12	1.9	3.7°	60	4	2	★	1	12.5	13.0	14.2	15.7
DF2XLB**R0100N160**	1	2	3	16	1.9	2.9°	80	4	2	★	1	16.7	17.4	19.0	*
DF2XLB**R0100N200**	1	2	3	20	1.9	2.5°	80	4	2	★	1	20.9	21.8	23.8	*
DF2XLB**R0100N250**	1	2	3	25	1.9	2.0°	80	4	2	★	1	26.1	27.2	*	*
DF2XLB**R0100N400**	1	2	3	40	1.9	1.4°	100	4	2	★	1	41.7	43.5	*	*
DF2XLB**R0100N600**	1	2	3	60	1.9	0.9°	100	4	2	★	1	62.6	*	*	*
DF2XLB**R0150N160**	1.5	3	4.5	16	2.9	1.7°	80	4	2	★	1	16.7	17.3	*	*
DF2XLB**R0150N250**	1.5	3	4.5	25	2.9	1.2°	80	4	2	★	1	26.1	27.2	*	*
DF2XLB**R0150N400**	1.5	3	4.5	40	2.9	0.7°	100	4	2	★	1	41.7	*	*	*
DF2XLB**R0150N600**	1.5	3	4.5	60	2.9	0.5°	100	4	2	★	1	*	*	*	*
DF2XLB**R0200N080**	2	4	6	8	3.9	—	80	4	2	★	2	*	*	*	*
DF2XLB**R0200N200**	2	4	6	20	3.9	—	80	4	2	★	2	*	*	*	*
DF2XLB**R0200N300**	2	4	6	30	3.9	—	80	4	2	★	2	*	*	*	*
DF2XLB**R0200N400**	2	4	6	40	3.9	—	100	4	2	★	2	*	*	*	*
DF2XLB**R0200N600**	2	4	6	60	3.9	—	100	4	2	★	2	*	*	*	*
DF2XLB**R0300N120**	3	6	9	12	5.85	—	100	6	2	★	2	*	*	*	*

* No interference

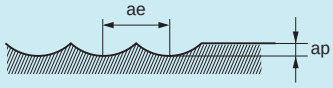
DF2XLB

Ball nose, Medium cut length, 2 flute, Long neck, For graphite

RECOMMENDED CUTTING CONDITIONS

Work material		Graphite					Copper, Copper alloys				
PRFRAD (mm)	**LU** (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Width of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Width of cut (mm)
R0.1	0.5	40000	800	31.5	0.01	0.03	40000	800	31.5	0.003	0.02
R0.15	2	40000	1200	47.2	0.03	0.08	40000	800	31.5	0.003	0.03
	3	40000	1200	47.2	0.03	0.08	40000	600	23.6	0.002	0.03
R0.2	1	40000	1500	59.1	0.05	0.15	40000	2000	78.7	0.015	0.04
	2	40000	1500	59.1	0.05	0.12	40000	1300	51.2	0.01	0.04
	3	40000	1300	51.2	0.04	0.12	40000	800	31.5	0.005	0.04
	4	40000	1300	51.2	0.04	0.1	32000	600	23.6	0.004	0.04
	8	30000	800	31.5	0.03	0.1	—	—	—	—	—
	12	20000	450	17.7	0.03	0.08	—	—	—	—	—
R0.25	4	40000	1500	59.1	0.05	0.15	40000	800	31.5	0.01	0.05
	5	38000	1300	51.2	0.05	0.15	36000	700	27.6	0.008	0.05
	8	30000	1000	39.4	0.04	0.12	28000	500	19.7	0.002	0.05
R0.3	2	40000	1800	70.9	0.07	0.2	40000	1500	59.1	0.03	0.06
	4	40000	1500	59.1	0.06	0.18	40000	1200	47.2	0.02	0.06
	5	40000	1500	59.1	0.06	0.17	40000	1100	43.3	0.015	0.06
	6	40000	1500	59.1	0.06	0.15	40000	1000	39.4	0.008	0.06
	8	37000	1200	47.2	0.05	0.15	35000	800	31.5	0.005	0.06
	10	35000	1000	39.4	0.05	0.15	—	—	—	—	—
	16	22000	530	20.9	0.04	0.12	—	—	—	—	—
R0.4	6	40000	1700	66.9	0.08	0.2	40000	1500	59.1	0.02	0.08
	8	40000	1700	66.9	0.08	0.15	30000	1200	47.2	0.008	0.08
R0.5	4	40000	2500	98.4	0.12	0.3	40000	2000	78.7	0.05	0.1
	6	40000	2500	98.4	0.1	0.3	40000	2000	78.7	0.03	0.1
	8	40000	2000	78.7	0.1	0.25	40000	1800	70.9	0.02	0.1
	10	40000	2000	78.7	0.1	0.2	33000	1400	55.1	0.01	0.1
	12	40000	2000	78.7	0.1	0.2	30000	1000	39.4	0.007	0.1
	20	30000	1100	43.3	0.08	0.2	—	—	—	—	—
	30	20000	600	23.6	0.06	0.15	—	—	—	—	—
	40	15000	400	15.7	0.04	0.12	—	—	—	—	—
Depth of cut											

1) When high machining accuracy is needed, or work piece becomes chipped, we recommend lowering feed rate.
2) Use a milling machine dedicated for graphite.
3) If rigidity of machine or work materials installation is very low, or chattering and noise are generated, reduce revolution and feed rate proportionately.

Work material		Graphite					Copper, Copper alloys				
PRFRAD (mm)	**LU** (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Width of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Width of cut (mm)
R0.75	8	40000	2800	110.2	0.15	0.45	40000	2400	94.5	0.07	0.15
	10	40000	2800	110.2	0.15	0.45	32000	1800	70.9	0.05	0.15
	16	35000	2000	78.7	0.15	0.3	20000	900	35.4	0.03	0.15
	30	27000	1000	39.4	0.1	0.3	—	—	—	—	—
R1	8	40000	3000	118.1	0.23	0.7	40000	3000	118.1	0.1	0.2
	10	40000	3000	118.1	0.2	0.6	40000	2800	110.2	0.08	0.2
	12	35000	2500	98.4	0.2	0.6	35000	2300	90.6	0.08	0.2
	16	30000	2000	78.7	0.2	0.5	30000	1800	70.9	0.05	0.2
	20	30000	2000	78.7	0.2	0.5	20000	1200	47.2	0.04	0.2
	25	25000	1500	59.1	0.18	0.45	20000	1000	39.4	0.03	0.2
	40	20000	1000	39.4	0.15	0.4	—	—	—	—	—
	60	15000	500	19.7	0.1	0.3	—	—	—	—	—
R1.5	16	28000	3000	118.1	0.3	0.9	28000	3000	118.1	0.3	0.3
	25	20000	2000	78.7	0.25	0.75	20000	2000	78.7	0.25	0.3
	40	16000	1500	59.1	0.2	0.6	16000	1500	59.1	0.2	0.3
	60	14000	1000	39.4	0.17	0.45	—	—	—	—	—
R2	8	24000	3800	149.6	0.5	1.5	24000	3800	149.6	0.5	0.4
	20	21000	3300	129.9	0.5	1.5	21000	3300	129.9	0.4	0.4
	30	15000	2000	78.7	0.4	1.2	15000	2000	78.7	0.3	0.4
	40	13000	1600	63.0	0.35	1.0	13000	1600	63.0	0.25	0.4
	60	12000	1400	55.1	0.3	0.9	12000	1400	55.1	0.2	0.4
R3	12	17000	2800	110.2	0.6	2.0	17000	2800	110.2	0.6	0.6
Depth of cut											

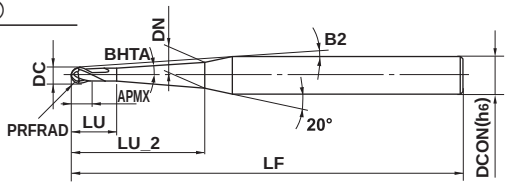
1) When high machining accuracy is needed, or work piece becomes chipped, we recommend lowering feed rate.
2) Use a milling machine dedicated for graphite.
3) If rigidity of machine or work materials installation is very low, or chattering and noise are generated, reduce revolution and feed rate proportionately.

DF3XB

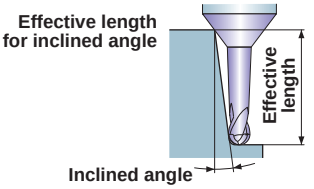
Ball nose, Medium cut length, 3 flute, Taper neck, For graphite

Aluminum Alloy	Copper	Graphite	GFRP CFRP	Machineable Ceramics
○	◎	◎	○	○





Type1



R	0.5≤PRFRAD≤2				
	±0.01				
h6	DCON=6				
	0 - 0.008				

● 3 flute taper neck ball nose end mill with original diamond coating for graphite machining.

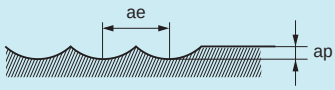
Unit : mm

Order Number	PRFRAD	DC	BHTA	APMX	LU_2	LU	B2	DN	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
DF3XBR0050L030	0.5	1	0.5°	1.5	30	3	4°	1.42	100	6	3	★	1	30.4	32.1	32.8	34.6
DF3XBR0050L040	0.5	1	0.5°	1.5	40	3	3.2°	1.60	100	6	3	★	1	40.4	41.4	43.6	46.0
DF3XBR0050L050	0.5	1	0.5°	1.5	50	3	2.6°	1.77	100	6	3	★	1	50.4	51.7	54.4	⋆
DF3XBR0100L040	1	2	0.5°	3	40	5	2.6°	2.52	100	6	3	★	1	40.7	41.7	43.9	⋆
DF3XBR0100L060	1	2	0.5°	3	60	5	1.8°	2.86	130	6	3	★	1	60.7	62.2	⋆	⋆
DF3XBR0100L080	1	2	0.5°	3	80	5	1.4°	3.21	130	6	3	★	1	80.7	82.7	⋆	⋆
DF3XBR0150L060	1.5	3	0.5°	4.5	60	7.5	1.4°	3.82	130	6	3	★	1	60.8	62.2	⋆	⋆
DF3XBR0150L080	1.5	3	0.5°	4.5	80	7.5	1.1°	4.17	130	6	3	★	1	80.8	82.8	⋆	⋆
DF3XBR0200L100	2	4	0.5°	6	100	9	0.6°	5.49	160	6	3	★	1	100.8	⋆	⋆	⋆

⋆ No interference

★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Work material		Graphite					Copper, Copper alloys				
PRFRAD (mm)	**LU_2** (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Width of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Width of cut (mm)
R0.5	30	20000	1100	43.3	0.05	0.13	16000	700	27.6	0.04	0.13
	40	15000	750	29.5	0.04	0.11	12000	480	18.9	0.03	0.11
	50	12000	500	19.7	0.03	0.10	9600	320	12.6	0.02	0.10
R1	40	20000	1800	70.9	0.13	0.40	16000	1100	43.3	0.10	0.40
	60	15000	900	35.4	0.09	0.27	12000	580	22.8	0.07	0.27
	80	12000	600	23.6	0.07	0.20	9600	380	15	0.06	0.20
R1.5	60	14000	1700	66.9	0.15	0.45	11000	1100	43.3	0.12	0.45
	80	12000	1200	47.2	0.12	0.35	9600	770	30.3	0.10	0.35
R2	100	10000	1100	43.3	0.20	0.50	8000	700	27.6	0.16	0.50
Depth of cut											

1) When high machining accuracy is needed, or work piece becomes chipped, we recommend lowering feed rate.
2) Use a milling machine dedicated for graphite.
3) If rigidity of machine or work materials installation is very low, or chattering and noise are generated, reduce revolution and feed rate proportionately.

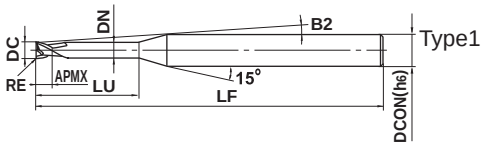
DFPSRB

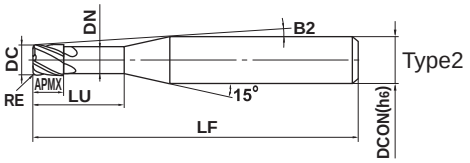
Corner radius end mill, Short cut length, 2-4 flute, High precision, For graphite

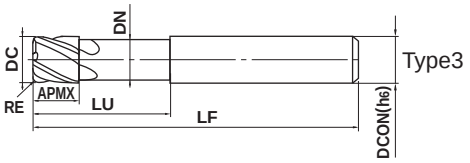
UWC DF 30° DC≤1.5 DC≥2

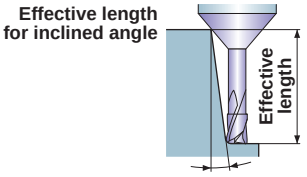
Aluminum Alloy	Copper	Graphite	GFRP CFRP	Machineable Ceramics
○	◎	◎	○	○











R	0.1≤RE≤1		
	±0.01		
	0.5≤DC≤12		
	0 - 0.02		
h6	4≤DCON≤6	8≤DCON≤10	DCON=12
	0 - 0.008	0 - 0.009	0 - 0.011

● ±0.01mm corner radius tolerance, 0—-0.02mm outer diameter tolerance. Corner radius end mill with original diamond coating for precise and efficient graphite machining.

Unit : mm

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
DFPSRBD0050R010N04	0.5	0.1	0.75	4	0.46	9.5°	60	4	2	★	1	4.1	4.3	4.6	5.0
DFPSRBD0050R010N05	0.5	0.1	0.75	5	0.46	8.7°	60	4	2	★	1	5.2	5.4	5.7	6.2
DFPSRBD0050R010N06	0.5	0.1	0.75	6	0.46	8.0°	60	4	2	★	1	6.2	6.4	6.9	7.5
DFPSRBD0050R010N10	0.5	0.1	0.75	10	0.46	6.1°	60	4	2	★	1	10.3	10.7	11.5	12.4
DFPSRBD0050R010N15	0.5	0.1	0.75	15	0.46	4.7°	60	4	2	★	1	15.5	16.0	17.2	18.6
DFPSRBD0080R010N06	0.8	0.1	1	6	0.76	7.7°	60	4	2	★	1	6.2	6.4	6.9	7.5
DFPSRBD0080R010N08	0.8	0.1	1	8	0.76	6.6°	60	4	2	★	1	8.3	8.6	9.2	9.9
DFPSRBD0100R010N08	1	0.1	1.5	8	0.94	6.3°	60	4	2	★	1	8.5	8.8	9.5	10.2
DFPSRBD0100R010N12	1	0.1	1.5	12	0.94	4.9°	60	4	2	★	1	12.6	13.1	14.1	15.2
DFPSRBD0100R020N08	1	0.2	1.5	8	0.94	6.3°	60	4	2	★	1	8.5	8.8	9.5	10.2
DFPSRBD0100R020N12	1	0.2	1.5	12	0.94	4.9°	60	4	2	★	1	12.6	13.1	14.1	15.2
DFPSRBD0100R020N16	1	0.2	1.5	16	0.94	4.0°	70	4	2	★	1	16.8	17.4	18.7	20.2
DFPSRBD0100R020N20	1	0.2	1.5	20	0.94	3.4°	70	4	2	★	1	20.9	21.7	23.3	25.1
DFPSRBD0100R020N30	1	0.2	1.5	30	0.94	2.5°	70	4	2	★	1	31.3	32.4	34.8	✶
DFPSRBD0150R020N10	1.5	0.2	2.3	10	1.44	4.9°	70	4	2	★	1	10.5	11.0	11.8	12.7
DFPSRBD0150R020N20	1.5	0.2	2.3	20	1.44	2.9°	70	4	2	★	1	20.9	21.7	23.3	✶
DFPSRBD0200R010N08	2	0.1	3	8	1.9	4.9°	70	4	4	★	2	8.4	8.7	9.4	10.1
DFPSRBD0200R020N12	2	0.2	3	12	1.9	3.7°	70	4	4	★	2	12.5	13.0	14.0	15.1
DFPSRBD0200R020N16	2	0.2	3	16	1.9	2.9°	70	4	4	★	2	16.7	17.3	18.6	✶
DFPSRBD0200R020N20	2	0.2	3	20	1.9	2.5°	80	4	4	★	2	20.8	21.5	23.2	✶
DFPSRBD0200R020N30	2	0.2	3	30	1.9	1.7°	80	4	4	★	2	31.2	32.2	✶	✶
DFPSRBD0200R020N40	2	0.2	3	40	1.9	1.4°	80	4	4	★	2	41.5	42.9	✶	✶
DFPSRBD0200R030N08	2	0.3	3	8	1.9	5.0°	70	4	4	★	2	8.4	8.7	9.3	10.1
DFPSRBD0300R020N20	3	0.2	4.5	20	2.9	1.4°	80	4	4	★	2	20.8	21.5	✶	✶
DFPSRBD0300R020N40	3	0.2	4.5	40	2.9	0.7°	80	4	4	★	2	41.5	✶	✶	✶
DFPSRBD0300R030N12	3	0.3	4.5	12	2.9	2.1°	80	4	4	★	2	12.5	13.0	13.9	✶
DFPSRBD0300R050N20	3	0.5	4.5	20	2.9	1.4°	80	4	4	★	2	20.8	21.5	✶	✶
DFPSRBD0400R020N20	4	0.2	6	20	3.9	—	80	4	4	★	3	✶	✶	✶	✶
DFPSRBD0400R020N40	4	0.2	6	40	3.9	—	80	4	4	★	3	✶	✶	✶	✶
DFPSRBD0400R050N20	4	0.5	6	20	3.9	—	80	4	4	★	3	✶	✶	✶	✶
DFPSRBD0400R050N40	4	0.5	6	40	3.9	—	80	4	4	★	3	✶	✶	✶	✶

✶ No interference

★ : Inventory maintained in Japan.

Unit : mm

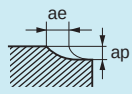
Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												30'	1°	2°	3°
DFPSRBD0600R010N24	6	0.1	9	24	5.85	—	90	6	4	★	3	⁎	⁎	⁎	⁎
DFPSRB**D0600R030N24**	6	0.3	9	24	5.85	—	90	6	4	★	3	⁎	⁎	⁎	⁎
DFPSRB**D0600R050N24**	6	0.5	9	24	5.85	—	90	6	4	★	3	⁎	⁎	⁎	⁎
DFPSRB**D0600R050N30**	6	0.5	9	30	5.85	—	90	6	4	★	3	⁎	⁎	⁎	⁎
DFPSRB**D0600R100N30**	6	1	9	30	5.85	—	90	6	4	★	3	⁎	⁎	⁎	⁎
DFPSRB**D0800R050N30**	8	0.5	12	30	7.85	—	90	8	4	★	3	⁎	⁎	⁎	⁎
DFPSRB**D0800R100N30**	8	1	12	30	7.85	—	90	8	4	★	3	⁎	⁎	⁎	⁎
DFPSRB**D1000R050N40**	10	0.5	15	40	9.7	—	130	10	4	★	3	⁎	⁎	⁎	⁎
DFPSRB**D1000R100N40**	10	1	15	40	9.7	—	130	10	4	★	3	⁎	⁎	⁎	⁎
DFPSRB**D1200R050N40**	12	0.5	18	40	11.7	—	130	12	4	★	3	⁎	⁎	⁎	⁎

⁎ No interference

DFPSRB

Corner radius end mill, Short cut length, 2-4 flute, High precision, For graphite

RECOMMENDED CUTTING CONDITIONS

Work material			Graphite					Copper, Copper alloys				
DC (mm)	RE (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Width of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Width of cut (mm)
0.5	0.1	4	30000	1100	43.3	0.05	0.23	24000	700	27.6	0.04	0.23
	0.1	5	28000	960	37.8	0.05	0.23	22000	600	23.6	0.04	0.23
	0.1	6	25000	850	33.5	0.05	0.23	20000	540	21.3	0.04	0.23
	0.1	10	22000	600	23.6	0.04	0.21	—	—	—	—	—
	0.1	15	20000	500	19.7	0.03	0.18	—	—	—	—	—
0.8	0.1	6	28000	1300	51.2	0.08	0.45	22000	830	32.7	0.06	0.45
	0.1	8	22000	900	35.4	0.08	0.45	18000	580	22.8	0.06	0.45
1	0.1	8	25000	1500	59.1	0.1	0.6	20000	960	37.8	0.08	0.6
	0.1	12	22000	1300	51.2	0.1	0.6	18000	830	32.7	0.08	0.6
	0.2	8	25000	1500	59.1	0.1	0.45	20000	960	37.8	0.08	0.45
	0.2	12	22000	1300	51.2	0.1	0.45	18000	830	32.7	0.08	0.45
	0.2	16	18000	1000	39.4	0.08	0.4	14000	640	25.2	0.06	0.4
	0.2	20	15000	800	31.5	0.08	0.4	—	—	—	—	—
	0.2	30	12000	600	23.6	0.07	0.35	—	—	—	—	—
1.5	0.2	10	18000	1400	55.1	0.15	0.8	14000	900	35.4	0.12	0.8
	0.2	20	12000	900	35.4	0.12	0.65	9600	580	22.8	0.1	0.65
2	0.1	8	24000	3300	129.9	0.2	1.2	19000	2100	82.7	0.16	1.2
	0.2	12	22000	3000	118.1	0.2	1.2	18000	1900	74.8	0.16	1.2
	0.2	16	19000	2500	98.4	0.2	1.2	15000	1600	63.0	0.16	1.2
	0.2	20	16000	2000	78.7	0.2	1.2	13000	1300	51.2	0.16	1.2
	0.2	30	13000	1600	63.0	0.16	1.0	—	—	—	—	—
	0.2	40	11000	1200	47.2	0.14	0.8	—	—	—	—	—
	0.3	8	24000	3300	129.9	0.3	1.2	19000	2100	82.7	0.24	1.2
3	0.2	20	18000	3000	118.1	0.3	2.0	14000	1900	74.8	0.24	2.0
	0.2	40	12000	1800	70.9	0.25	1.7	9600	1100	43.3	0.2	1.7
	0.5	20	18000	3000	118.1	0.3	1.5	14000	1900	74.8	0.24	1.5
	0.3	12	20000	4500	177.2	0.3	1.5	16000	2900	114.2	0.24	1.5
4	0.2	20	18000	4200	165.4	0.4	2.7	14000	2700	106.3	0.3	2.7
	0.2	40	13000	2800	110.2	0.4	2.7	10000	1800	70.9	0.3	2.7
	0.5	20	18000	4200	165.4	0.4	2.3	14000	2700	106.3	0.3	2.3
	0.5	40	13000	2800	110.2	0.4	2.3	10000	1800	70.9	0.3	2.3
6	0.1	24	14000	4600	181.1	0.6	3.8	11000	2900	114.2	0.5	3.8
	0.3	24	14000	4600	181.1	0.6	3.8	11000	2900	114.2	0.5	3.8
	0.5	24	14000	4600	181.1	0.6	3.8	11000	2900	114.2	0.5	3.8
	0.5	30	14000	4600	181.1	0.6	3.8	11000	2900	114.2	0.5	3.8
	1	30	14000	4600	181.1	0.6	3.0	11000	2900	114.2	0.5	3.0
8	0.5	30	10500	4000	157.5	0.8	5.3	8400	2600	102.4	0.6	5.3
	1	30	10500	4000	157.5	0.8	4.5	8400	2600	102.4	0.6	4.5
10	0.5	40	8700	3500	137.8	1.0	6.8	7000	2200	86.6	0.8	6.8
	1	40	8700	3500	137.8	1.0	6.0	7000	2200	86.6	0.8	6.0
12	0.5	40	7200	3000	118.1	1.2	8.0	5800	1900	74.8	1.0	8.0
Depth of cut												

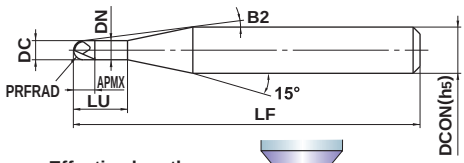
1) When high machining accuracy is needed, or work piece becomes chipped, we recommend lowering feed rate.
2) Use a milling machine dedicated for graphite.
3) If rigidity of machine or work materials installation is very low, or chattering and noise are generated, reduce revolution and feed rate proportionately.

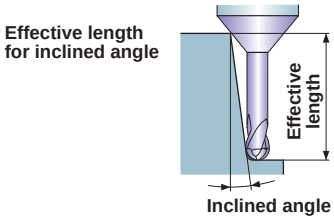
CBN2XLB

Ball nose, Short cut length, 2 flute, Long neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				







R	0.2≤PRFRAD≤1				
	±0.005				
h5	4≤DCON≤6				
	0 - 0.005				

● Solid CBN ball nose. A wide variation of neck lengths available.

Unit : mm

Order Number	PRFRAD	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
CBN2XLBR0020N010S04	0.2	0.4	0.3	1	0.36	13.4°	51	4	2	★	1	1	1	1.1	1.2
CBN2XLB**R0020N010S06**	0.2	0.4	0.3	1	0.36	13.9°	51	6	2	★	1	1	1	1.1	1.2
CBN2XLB**R0020N016S04**	0.2	0.4	0.3	1.6	0.36	12.4°	51	4	2	★	1	1.6	1.7	1.8	2
CBN2XLB**R0020N016S06**	0.2	0.4	0.3	1.6	0.36	13.3°	51	6	2	★	1	1.6	1.7	1.8	2
⋆ CBN2XLB**R0030N009S06**	0.3	0.6	0.4	0.9	0.56	14.1°	62	6	2	★	1	0.9	0.9	1.0	1.1
CBN2XLB**R0030N015S04**	0.3	0.6	0.5	1.5	0.56	12.6°	51	4	2	★	1	1.5	1.6	1.7	1.8
CBN2XLB**R0030N015S06**	0.3	0.6	0.5	1.5	0.56	13.4°	51	6	2	★	1	1.5	1.6	1.7	1.8
CBN2XLB**R0030N024S04**	0.3	0.6	0.5	2.4	0.56	11.3°	51	4	2	★	1	2.5	2.6	2.7	2.9
CBN2XLB**R0030N024S06**	0.3	0.6	0.5	2.4	0.56	12.5°	51	6	2	★	1	2.5	2.6	2.7	2.9
⋆ CBN2XLB**R0040N010S06**	0.4	0.8	0.5	1	0.76	14.1°	62	6	2	★	1	1	1	1.1	1.2
CBN2XLB**R0040N020S04**	0.4	0.8	0.6	2	0.76	11.8°	51	4	2	★	1	2	2.1	2.3	2.4
CBN2XLB**R0040N020S06**	0.4	0.8	0.6	2	0.76	12.9°	51	6	2	★	1	2	2.1	2.3	2.4
CBN2XLB**R0040N032S04**	0.4	0.8	0.6	3.2	0.76	10.3°	51	4	2	★	1	3.3	3.4	3.6	3.9
CBN2XLB**R0040N032S06**	0.4	0.8	0.6	3.2	0.76	11.7°	51	6	2	★	1	3.3	3.4	3.6	3.9
⋆ CBN2XLB**R0050N011S06**	0.5	1	0.6	1.1	0.94	14.1°	62	6	2	★	1	1.1	1.1	1.2	1.2
CBN2XLB**R0050N025S04**	0.5	1	0.8	2.5	0.94	11°	51	4	2	★	1	2.6	2.7	2.8	3
CBN2XLB**R0050N025S06**	0.5	1	0.8	2.5	0.94	12.3°	51	6	2	●	1	2.6	2.7	2.8	3
CBN2XLB**R0050N040S04**	0.5	1	0.8	4	0.94	9.3°	51	4	2	★	1	4.1	4.3	4.6	4.9
CBN2XLB**R0050N040S06**	0.5	1	0.8	4	0.94	11°	51	6	2	●	1	4.1	4.3	4.6	4.9
CBN2XLB**R0075N038S04**	0.75	1.5	1.1	3.8	1.44	9.1°	52	4	2	★	1	3.9	4.1	4.3	4.6
CBN2XLB**R0075N038S06**	0.75	1.5	1.1	3.8	1.44	11°	52	6	2	★	1	3.9	4.1	4.3	4.6
CBN2XLB**R0075N060S04**	0.75	1.5	1.1	6	1.44	7.1°	52	4	2	★	1	6.2	6.4	6.8	7.3
CBN2XLB**R0075N060S06**	0.75	1.5	1.1	6	1.44	9.3°	52	6	2	★	1	6.2	6.4	6.8	7.3
⋆ CBN2XLB**R0100N017S06**	1	2	1.2	1.7	1.9	13.6°	62	6	2	★	1	1.7	1.7	1.8	1.9
CBN2XLB**R0100N050S04**	1	2	1.5	5	1.9	7.3°	52	4	2	★	1	5.1	5.3	5.6	6
CBN2XLB**R0100N050S06**	1	2	1.5	5	1.9	9.8°	52	6	2	★	1	5.1	5.3	5.6	6
CBN2XLB**R0100N080S04**	1	2	1.5	8	1.9	5.3°	52	4	2	★	1	8.2	8.5	9	9.7
CBN2XLB**R0100N080S06**	1	2	1.5	8	1.9	7.9°	52	6	2	★	1	8.2	8.5	9	9.7

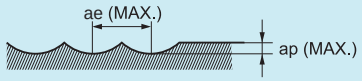
⋆ Short edge and neck lengths for high rigidity.

● : Inventory maintained. ★ : Inventory maintained in Japan.

CBN2XLB

Ball nose, Short cut length, 2 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

Work material	Hardened steel (45—55HRC) AISI H13 etc.					Hardened steel (55—62HRC) AISI D2 etc.					Hardened steel (62—70HRC) AISI W1, AISI M2 etc.				
PRFRAD (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
R0.2	50000	1500	59.1	0.006	0.01	50000	1200	47.2	0.006	0.01	50000	1200	47.2	0.004	0.008
R0.3	50000	2000	78.7	0.01	0.02	50000	1500	59.1	0.01	0.02	50000	1500	59.1	0.008	0.015
R0.4	50000	3000	118.1	0.02	0.05	50000	2000	78.7	0.02	0.04	50000	2000	78.7	0.015	0.03
R0.5	50000	3000	118.1	0.03	0.06	50000	2000	78.7	0.03	0.05	50000	2000	78.7	0.02	0.03
R0.75	50000	3500	137.8	0.04	0.08	50000	2500	98.4	0.03	0.06	50000	2500	98.4	0.02	0.04
R1	50000	4000	157.5	0.05	0.1	50000	3000	118.1	0.04	0.07	50000	3000	118.1	0.03	0.05
Depth of cut															

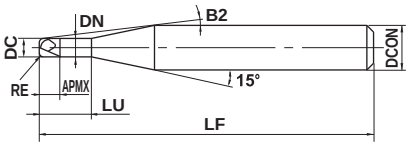
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Oil mist coolant is recommended.
3) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

CBN2XLRB

Corner radius end mill, Short cut length, 2 flute, Long neck

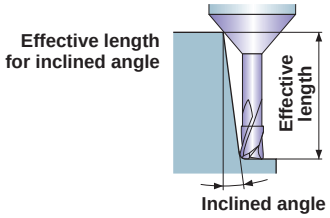
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				





Type 1

R	0.05≤RE≤0.5				
	±0.005				
	0.5<DC≤2				
	0 -0.010				
h5	DCON=4				
	0 -0.005				



● CBN long neck radius end mill. A wide variation of neck lengths available.

Unit : mm

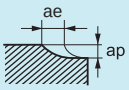
Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
CBN2XLRBD0050R005N02	0.05	0.5	0.3	2	0.46	11.6°	51	4	2	★	1	2.1	2.1	2.3	2.5
CBN2XLRB**D0050R005N03**	0.05	0.5	0.3	3	0.46	10.4°	51	4	2	★	1	3.1	3.2	3.5	3.7
CBN2XLRB**D0050R010N02**	0.1	0.5	0.3	2	0.46	11.7°	51	4	2	★	1	2.1	2.1	2.3	2.5
CBN2XLRB**D0050R010N03**	0.1	0.5	0.3	3	0.46	10.5°	51	4	2	★	1	3.1	3.2	3.4	3.7
CBN2XLRB**D0100R005N03**	0.05	1	0.6	3	0.94	9.7°	51	4	2	★	1	3.2	3.4	3.7	4
CBN2XLRB**D0100R005N05**	0.05	1	0.6	5	0.94	7.9°	51	4	2	★	1	5.3	5.6	6	6.5
CBN2XLRB**D0100R010N03**	0.1	1	0.6	3	0.94	9.7°	51	4	2	★	1	3.2	3.4	3.6	4
CBN2XLRB**D0100R010N05**	0.1	1	0.6	5	0.94	8°	51	4	2	★	1	5.3	5.6	6	6.5
CBN2XLRB**D0100R020N03**	0.2	1	0.6	3	0.94	9.8°	51	4	2	★	1	3.2	3.4	3.5	4
CBN2XLRB**D0100R020N05**	0.2	1	0.6	5	0.94	8°	51	4	2	★	1	5.3	5.6	6	6.5
CBN2XLRB**D0100R030N03**	0.3	1	0.6	3	0.94	9.9°	51	4	2	★	1	3.2	3.4	3.4	4
CBN2XLRB**D0100R030N05**	0.3	1	0.6	5	0.94	8.1°	51	4	2	★	1	5.3	5.6	6	6.5
CBN2XLRB**D0150R010N05**	0.1	1.5	0.9	5	1.44	7.3°	52	4	2	★	1	5.3	5.6	6	6.5
CBN2XLRB**D0150R010N08**	0.1	1.5	0.9	8	1.44	5.6°	52	4	2	★	1	8.5	8.8	9.5	10.2
CBN2XLRB**D0150R020N05**	0.2	1.5	0.9	5	1.44	7.3°	52	4	2	★	1	5.3	5.6	6	6.5
CBN2XLRB**D0150R020N08**	0.2	1.5	0.9	8	1.44	5.6°	52	4	2	★	1	8.5	8.8	9.5	10.2
CBN2XLRB**D0150R030N05**	0.3	1.5	0.9	5	1.44	7.4°	52	4	2	★	1	5.3	5.6	6	6.5
CBN2XLRB**D0150R030N08**	0.3	1.5	0.9	8	1.44	5.7°	52	4	2	★	1	8.5	8.8	9.5	10.2
CBN2XLRB**D0200R010N06**	0.1	2	1.2	6	1.9	5.9°	52	4	2	★	1	6.3	6.6	7.1	7.6
CBN2XLRB**D0200R010N10**	0.1	2	1.2	10	1.9	4.2°	52	4	2	★	1	10.5	10.9	11.7	12.6
CBN2XLRB**D0200R020N06**	0.2	2	1.2	6	1.9	5.9°	52	4	2	★	1	6.3	6.6	7.1	7.6
CBN2XLRB**D0200R020N10**	0.2	2	1.2	10	1.9	4.2°	52	4	2	★	1	10.5	10.9	11.7	12.6
CBN2XLRB**D0200R030N06**	0.3	2	1.2	6	1.9	6°	52	4	2	★	1	6.3	6.6	7	7.6
CBN2XLRB**D0200R030N10**	0.3	2	1.2	10	1.9	4.2°	52	4	2	★	1	10.5	10.8	11.6	12.6
CBN2XLRB**D0200R050N06**	0.5	2	1.2	6	1.9	6.1°	52	4	2	★	1	6.3	6.5	7	7.5
CBN2XLRB**D0200R050N10**	0.5	2	1.2	10	1.9	4.3°	52	4	2	★	1	10.5	10.8	11.6	12.5

★ : Inventory maintained in Japan.

CBN2XLRB

Corner radius end mill, Short cut length, 2 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

Work material	Hardened steel (45—55HRC) AISI H13 etc.					Hardened steel (55—62HRC) AISI D2 etc.					Hardened steel (62—70HRC) AISI W1, AISI M2 etc.				
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
0.5	50000	750	29.5	0.01	0.2	50000	600	23.6	0.01	0.1	40000	400	15.7	0.005	0.06
1	38000	1100	43.3	0.02	0.3	38000	760	29.9	0.01	0.2	25000	400	15.7	0.01	0.1
1.5	25000	900	35.4	0.03	0.5	25000	700	27.6	0.02	0.4	17000	340	13.4	0.02	0.2
2	20000	800	31.5	0.04	0.7	20000	600	23.6	0.03	0.6	12000	300	11.8	0.02	0.3
Depth of cut															

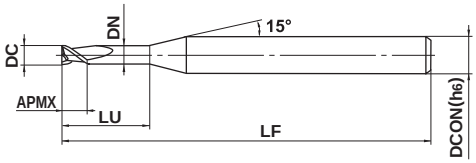
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Oil mist coolant is recommended.
3) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

C2SA

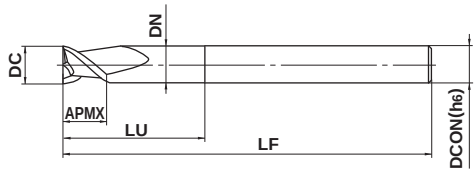
2 flute, Short cut length, Relieved neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
						○	◎





Type 1



Type 2

h6

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● High efficiency machining for aluminum alloys.

Unit : mm

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
C2SAD0300N120	3	6	12	2.7	60	6	2	★	1
C2SA**D0400N120**	4	6	12	3.7	60	6	2	★	1
C2SA**D0500N150**	5	8	15	4.7	60	6	2	★	1
C2SA**D0600N160**	6	8	16	5.7	75	6	2	★	2
C2SA**D0800N200**	8	10	20	7.4	75	8	2	★	2
C2SA**D1000N300**	10	12	30	9.4	75	10	2	★	2
C2SA**D1000N350**	10	12	35	9.4	100	10	2	★	2
C2SA**D1200N300**	12	15	30	11.4	75	12	2	★	2
C2SA**D1200N350**	12	15	35	11.4	100	12	2	★	2
C2SA**D1200N400**	12	15	40	11.4	125	12	2	★	2
C2SA**D1600N300**	16	15	30	15.4	75	16	2	★	2
C2SA**D1600N400**	16	15	40	15.4	100	16	2	★	2
C2SA**D1600N450**	16	15	45	15.4	125	16	2	★	2
C2SA**D2000N400**	20	20	40	18	100	20	2	★	2
C2SA**D2000N500**	20	20	50	18	125	20	2	★	2

★ : Inventory maintained in Japan.

C2SA

2 flute, Short cut length, Relieved neck, For aluminum alloy

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Aluminum alloy		
DC (mm)	Revolution (min^{-1})	Table feed	
		(mm/min)	(IPM)
3	40000	1800	70.9
4	36000	2400	94.5
5	30000	3000	118.1
6	27000	3200	126.0
8	20000	3400	133.9
10	16000	3600	141.7
12	13000	3600	141.7
16	10000	3600	141.7
20	8000	3300	129.9
Depth of cut	≤0.5DC, ≤0.8DC		

Slotting

Work material	Aluminum alloy		
DC (mm)	Revolution (min^{-1})	Table feed	
		(mm/min)	(IPM)
3	40000	1600	63.0
4	36000	2100	82.7
5	30000	2700	106.3
6	27000	2800	110.2
8	20000	3000	118.1
10	16000	3200	126.0
12	13000	3200	126.0
16	10000	3200	126.0
20	8000	3000	118.1
Depth of cut	DC, ≤0.8DC		

1) Water-soluble cutting fluid is recommended.
2) Climb cutting is recommended for shoulder milling.
3) If the tooling clamping is insufficient, the tool can be pulled out of the holder therefore ensure that it is securely located.
4) The above are for L/D of up to 4. If exceeding L/D of 4 reduce the speed, feed and depth of cut proportionately.
5) If the rigidity of the machine or the workpiece installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.

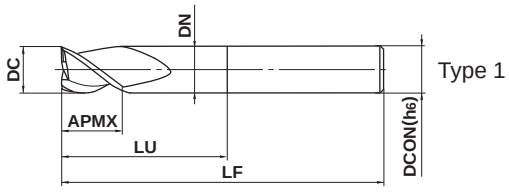
C3SA

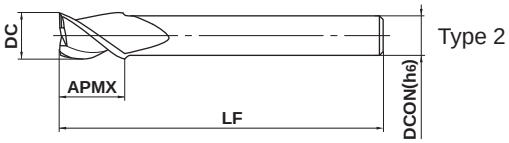
3 flute, Short cut length, Relieved neck



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
						○	◎







h6

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
8≤DCON≤10	12≤DCON≤18	20≤DCON≤25		
0 - 0.009	0 - 0.011	0 - 0.013		

● High efficiency machining for aluminum alloys.

Unit : mm

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type	The Center Cutting Edge
C3SAD1000A100S08	10	12	—	—	100	8	3	★	2	○
C3SA**D1000N300**	10	12	30	9.4	75	10	3	★	1	—
C3SA**D1000N350**	10	12	35	9.4	100	10	3	★	1	—
C3SA**D1200A150S10**	12	15	—	—	150	10	3	★	2	○
C3SA**D1200N300**	12	15	30	11.4	75	12	3	★	1	—
C3SA**D1200N350**	12	15	35	11.4	100	12	3	★	1	—
C3SA**D1200N400**	12	15	40	11.4	125	12	3	★	1	—
C3SA**D1600A200S14**	16	15	—	—	200	14	3	★	2	○
C3SA**D1600N300**	16	15	30	15.4	75	16	3	★	1	—
C3SA**D1600N400**	16	15	40	15.4	100	16	3	★	1	—
C3SA**D1600N450**	16	15	45	15.4	125	16	3	★	1	—
C3SA**D1700A150S16**	17	18	—	—	150	16	3	★	2	○
C3SA**D1800A200S16**	18	18	—	—	200	16	3	★	2	○
C3SA**D2000A200S18**	20	20	—	—	200	18	3	★	2	○
C3SA**D2000N400**	20	20	40	18	100	20	3	★	1	—
C3SA**D2000N600**	20	20	60	18	125	20	3	★	1	—
C3SA**D2000N850**	20	20	85	18	150	20	3	★	1	—
C3SA**D2500N500**	25	20	50	23	100	25	3	★	1	—
C3SA**D2500N650**	25	20	65	23	125	25	3	★	1	—
C3SA**D2500N900**	25	20	90	23	150	25	3	★	1	—
C3SA**D2600A200S25**	26	20	—	—	200	25	3	★	2	○

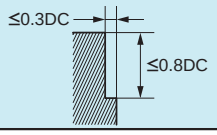
★ : Inventory maintained in Japan.

C3SA

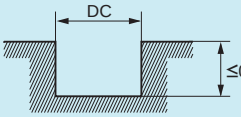
3 flute, Short cut length, Relieved neck, For aluminum alloy

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Aluminum alloy		
DC (mm)	Revolution (min^{-1})	Table feed	
		(mm/min)	(IPM)
12	13000	5400	212.6
16	10000	5400	212.6
18	9000	5000	196.9
20	8000	5000	196.9
25	6000	4500	177.2
Depth of cut			

Slotting

Work material	Aluminum alloy		
DC (mm)	Revolution (min^{-1})	Table feed	
		(mm/min)	(IPM)
12	13000	3200	126.0
16	10000	3200	126.0
18	9000	3000	118.1
20	8000	3000	118.1
25	6000	2800	110.2
Depth of cut			

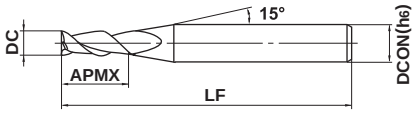
1) Water-soluble cutting fluid is recommended.
2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and feed rate proportionately, or set the depth of cut smaller.
3) Climb cutting is recommended for shoulder milling.
4) The above are for L/D of up to 4. If exceeding L/D of 4 reduce the speed, feed and depth of cut proportionately.
5) Not center cutting edge therefore vertical feed can not be carried at. If vertical feed is necessary please use ramping.

C2MHA

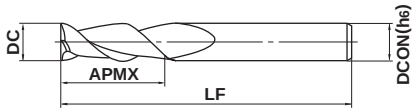
2 flute, Medium cut length, Relieved neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎

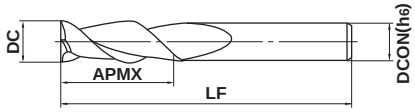




Type 1



Type 2



Type 3

h6

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● High efficiency machining for aluminum alloys.

Unit : mm

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
C2MHAD0300	3	9	60	6	2	★	1
C2MHA**D0400**	4	12	60	6	2	★	1
C2MHA**D0500**	5	15	60	6	2	★	1
C2MHA**D0600**	6	18	60	6	2	★	2
C2MHA**D0800**	8	20	75	8	2	★	2
C2MHA**D1000**	10	25	75	10	2	★	2
C2MHA**D1200**	12	25	75	12	2	★	2
C2MHA**D1400**	14	32	75	12	2	★	3
C2MHA**D1600**	16	32	100	16	2	★	2
C2MHA**D2000**	20	38	125	20	2	★	2
C2MHA**D2500**	25	38	125	25	2	★	2

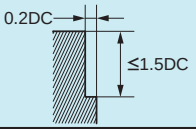
★ : Inventory maintained in Japan.

C2MHA

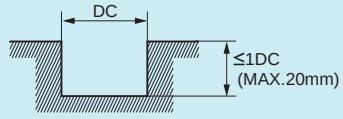
2 flute, Medium cut length, Relieved neck, For aluminum alloy

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Aluminum alloy		
DC (mm)	Revolution (min^{-1})	Table feed	
		(mm/min)	(IPM)
3	40000	2400	94.5
4	36000	2600	102.4
5	30000	4000	157.5
6	27000	4000	157.5
8	20000	4000	157.5
10	16000	4500	177.2
12	13000	4500	177.2
16	10000	4500	177.2
20	8000	4300	169.3
25	6000	3600	141.7
Depth of cut			

Slotting

Work material	Aluminum alloy		
DC (mm)	Revolution (min^{-1})	Table feed	
		(mm/min)	(IPM)
3	40000	1500	59.1
4	36000	1800	70.9
5	30000	2800	110.2
6	27000	2800	110.2
8	20000	2800	110.2
10	16000	3200	126.0
12	13000	3200	126.0
16	10000	3200	126.0
20	8000	3000	118.1
25	6000	2500	98.4
Depth of cut			

1) Water-soluble cutting fluid is recommended.
2) Climb cutting is recommended for shoulder milling.
3) If the tooling clamping is insufficient, the tool can be pulled out of the holder therefore ensure that it is securely located.
4) If the rigidity of the machine or the workpiece installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.

C3SARB

Corner radius, Short cut length, 3 flute, For aluminum alloy

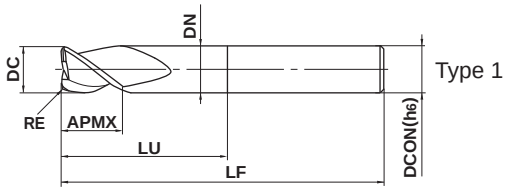


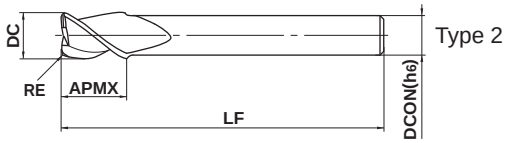




Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
						○	◎









DC≤12	DC>12			
0 - 0.020	0 - 0.030			
12≤DCON≤16	20≤DCON≤25			
0 - 0.011	0 - 0.013			

● High efficiency machining for aluminium alloys.

Unit : mm

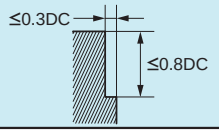
Order Number	DC	RE	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
C3SARBD1200N0300R100	12	1	15	30	11.4	75	12	3	★	1
C3SARB**D1200N0300R320**	12	3.2	15	30	11.4	75	12	3	★	1
C3SARB**D1200N0400R100**	12	1	15	40	11.4	125	12	3	★	1
C3SARB**D1200N0400R320**	12	3.2	15	40	11.4	125	12	3	★	1
C3SARB**D1600N0450R100**	16	1	15	45	15.4	125	16	3	★	1
C3SARB**D1600N0450R320**	16	3.2	15	45	15.4	125	16	3	★	1
C3SARB**D1600N0700R100**	16	1	15	70	15.4	150	16	3	★	1
C3SARB**D1600N0700R320**	16	3.2	15	70	15.4	150	16	3	★	1
C3SARB**D1800R100**	18	1	18	—	—	150	16	3	★	2
C3SARB**D1800R320**	18	3.2	18	—	—	150	16	3	★	2
C3SARB**D2000N0600R100**	20	1	20	60	18.0	125	20	3	★	1
C3SARB**D2000N0600R320**	20	3.2	20	60	18.0	125	20	3	★	1
C3SARB**D2000N0600R400**	20	4	20	60	18.0	125	20	3	★	1
C3SARB**D2000N0850R100**	20	1	20	85	18.0	150	20	3	★	1
C3SARB**D2000N0850R320**	20	3.2	20	85	18.0	150	20	3	★	1
C3SARB**D2000N0850R400**	20	4	20	85	18.0	150	20	3	★	1
C3SARB**D2500N0650R320**	25	3.2	20	65	23.0	125	25	3	★	1
C3SARB**D2500N0650R400**	25	4	20	65	23.0	125	25	3	★	1
C3SARB**D2500N0650R500**	25	5	20	65	23.0	125	25	3	★	1
C3SARB**D2500N0900R320**	25	3.2	20	90	23.0	150	25	3	★	1
C3SARB**D2500N0900R400**	25	4	20	90	23.0	150	25	3	★	1
C3SARB**D2500N0900R500**	25	5	20	90	23.0	150	25	3	★	1

★ : Inventory maintained in Japan.

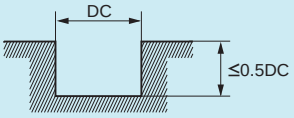
C3SARB

Corner radius, Short cut length, 3 flute, For aluminum alloy

Shoulder milling

Work material	Aluminum alloy		
DC (mm)	Revolution (min^{-1})	Table feed	
		(mm/min)	(IPM)
12	13000	5400	212.6
16	10000	5400	212.6
18	9000	5000	196.9
20	8000	5000	196.9
25	6000	4500	177.2
Depth of cut			

Slotting

Work material	Aluminum alloy		
DC (mm)	Revolution (min^{-1})	Table feed	
		(mm/min)	(IPM)
12	13000	3200	126.0
16	10000	3200	126.0
18	9000	3000	118.1
20	8000	3000	118.1
25	6000	2800	110.2
Depth of cut			

1) Water-soluble cutting fluid is recommended.
2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and feed rate proportionately, or set the depth of cut smaller.
3) Climb cutting is recommended for shoulder milling.
4) The above are for L/D of up to 4. If exceeding L/D of 4 reduce the speed, feed and depth of cut proportionately.
5) Not center cutting edge therefore vertical feed can not be carried at. If vertical feed is necessary please use ramping.

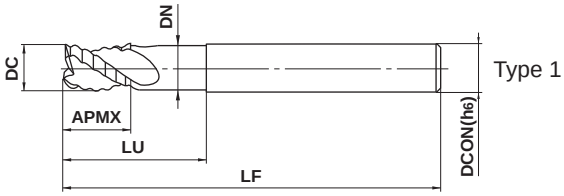
CSRA NEW

Roughing end mill, Short cut length, 3 flute, For aluminium alloy

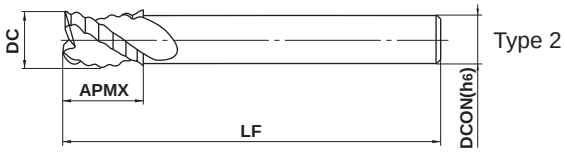
UWC 37.5°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎





Type 1



Type 2

h6

DCON=10	12≤DCON≤16	20≤DCON≤25		
0 - 0.009	0 - 0.011	0 - 0.013		

●3 flute uncoated end mill for roughing aluminium alloy.

Unit : mm

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
CSRAD1000	10	12	25	9.4	75	10	3	★	1
CSRA**D1200**	12	15	30	11.4	75	12	3	★	1
CSRA**D1600**	16	18	35	15.4	100	16	3	★	1
CSRA**D1800**	18	22	—	—	100	16	3	★	2
CSRA**D2000**	20	25	50	18.0	125	20	3	★	1
CSRA**D2200**	22	25	—	—	125	20	3	★	2
CSRA**D2500**	25	30	60	23.0	125	25	3	★	1

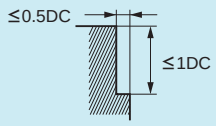
★ : Inventory maintained in Japan.

CSRA

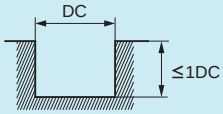
Roughing end mill, Short cut length, 3 flute, For aluminium alloy

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Aluminum alloy			Aluminium cast		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
10	19000	8600	339	9500	3400	134
12	16000	8200	323	8000	3200	126
16	12000	7600	299	6000	3100	122
18	10500	7200	283	5300	2900	114
20	9500	7100	280	4800	2900	114
22	8500	6900	272	4300	2800	110
25	7500	6800	268	3800	2700	106
Depth of cut						

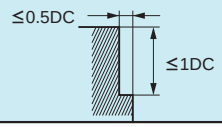
Slotting

Work material	Aluminum alloy			Aluminium cast		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
10	19000	6800	268	9500	2700	106
12	16000	6500	256	8000	2600	102
16	12000	6100	240	6000	2400	94
18	10500	5800	228	5300	2400	94
20	9500	5700	224	4800	2300	90
22	8500	5500	217	4300	2200	87
25	7500	5400	213	3800	2200	87
Depth of cut						

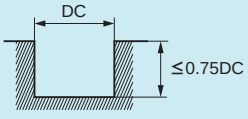
1) Water-soluble cutting fluid is recommended.
2) If the depth of cut is shallow, the revolution and feed rate can be increased.
3) Climb cutting is recommended for shoulder milling.
4) Not center cutting edge therefore vertical feed can not be carried at. If vertical feed is necessary please use ramping.
5) If the rigidity of the machine or the workpiece installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.

Using a high-speed and high-rigidity machining center

Shoulder milling

Work material	Aluminum alloy			Aluminium cast		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
10	30000	11000	433	19000	5400	213
12	30000	12000	472	16000	5300	209
16	24000	12000	472	12000	4900	193
18	21000	12000	472	10500	4700	185
20	19000	11000	433	9500	4600	181
22	17000	11000	433	8500	4300	169
25	15000	11000	433	7500	4300	169
Depth of cut						

Slotting

Work material	Aluminum alloy			Aluminium cast		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
10	30000	8600	339	19000	4300	169
12	30000	9900	390	16000	4300	169
16	24000	9700	382	12000	4000	157
18	21000	9500	374	10500	3800	150
20	19000	9100	358	9500	3700	146
22	17000	8700	343	8500	3400	134
25	15000	8600	339	7500	3400	134
Depth of cut						

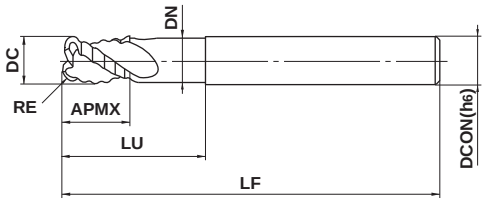
1) Water-soluble cutting fluid is recommended.
2) If the depth of cut is shallow, the revolution and feed rate can be increased.
3) Climb cutting is recommended for shoulder milling.
4) Not center cutting edge therefore vertical feed can not be carried at. If vertical feed is necessary please use ramping.
5) If the rigidity of the machine or the workpiece installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.

CSRARB NEW

Corner radius roughing end mill, Short cut length, 3 flute, For aluminium alloy

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎





Type 1

h6	DCON=10	12≤DCON≤16	20≤DCON≤25		
	0 - 0.009	0 - 0.011	0 - 0.013		

●3 flute uncoated end mill for roughing aluminium alloy.

Unit : mm

Order Number	DC	RE	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
CSRARBD1000R100	10	1	12	25	9.4	75	10	3	★	1
CSRARB**D1000R200**	10	2	12	25	9.4	75	10	3	★	1
CSRARB**D1200R100**	12	1	15	30	11.4	75	12	3	★	1
CSRARB**D1200R200**	12	2	15	30	11.4	75	12	3	★	1
CSRARB**D1600R200**	16	2	18	35	15.4	100	16	3	★	1
CSRARB**D1600R300**	16	3	18	35	15.4	100	16	3	★	1
CSRARB**D2000R200**	20	2	25	50	18.0	125	20	3	★	1
CSRARB**D2000R300**	20	3	25	50	18.0	125	20	3	★	1
CSRARB**D2500R300**	25	3	30	60	23.0	125	25	3	★	1
CSRARB**D2500R400**	25	4	30	60	23.0	125	25	3	★	1
CSRARB**D2500R500**	25	5	30	60	23.0	125	25	3	★	1

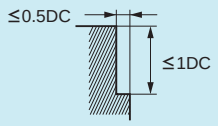
★ : Inventory maintained in Japan.

CSRARB

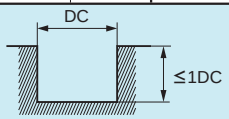
Roughing end mill, Short cut length, 3 flute, For aluminium alloy

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Aluminum alloy			Aluminium cast		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
10	19000	8600	339	9500	3400	134
12	16000	8200	323	8000	3200	126
16	12000	7600	299	6000	3100	122
18	10500	7200	283	5300	2900	114
20	9500	7100	279	4800	2900	114
22	8500	6900	272	4300	2800	110
25	7500	6800	268	3800	2700	106
Depth of cut						

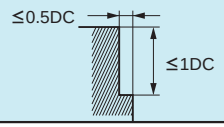
Slotting

Work material	Aluminum alloy			Aluminium cast		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
10	19000	6800	268	9500	2700	106
12	16000	6500	256	8000	2600	102
16	12000	6100	240	6000	2400	94
18	10500	5800	228	5300	2400	94
20	9500	5700	224	4800	2300	91
22	8500	5500	216	4300	2200	87
25	7500	5400	213	3800	2200	87
Depth of cut						

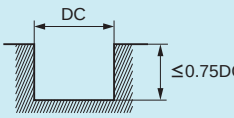
1) Water-soluble cutting fluid is recommended.
2) If the depth of cut is shallow, the revolution and feed rate can be increased.
3) Climb cutting is recommended for shoulder milling.
4) Not center cutting edge therefore vertical feed can not be carried at. If vertical feed is necessary please use ramping.
5) If the rigidity of the machine or the workpiece installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.

Using a high-speed and high-rigidity machining center

Shoulder milling

Work material	Aluminum alloy			Aluminium cast		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
10	30000	11000	433	19000	5400	213
12	30000	12000	472	16000	5300	209
16	24000	12000	472	12000	4900	193
18	21000	12000	472	10500	4700	185
20	19000	11000	433	9500	4600	181
22	17000	11000	433	8500	4300	169
25	15000	11000	433	7500	4300	169
Depth of cut						

Slotting

Work material	Aluminum alloy			Aluminium cast		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
10	30000	8600	339	19000	4300	169
12	30000	9900	389	16000	4300	169
16	24000	9700	381	12000	4000	169
18	21000	9500	374	10500	3800	149
20	19000	9100	358	9500	3700	146
22	17000	8700	342	8500	3400	134
25	15000	8600	338	7500	3400	134
Depth of cut						

1) Water-soluble cutting fluid is recommended.
2) If the depth of cut is shallow, the revolution and feed rate can be increased.
3) Climb cutting is recommended for shoulder milling.
4) Not center cutting edge therefore vertical feed can not be carried at. If vertical feed is necessary please use ramping.
5) If the rigidity of the machine or the workpiece installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.

Memo

Four geometries now available with through coolant.

HEAD

Type	Applications, Features	No. of Flutes	Product Code	Shape	Size Range	Coolant	Long cutting edge	Work Material: P Carbon Steel	P Tool steel	H -55HRC	H 55HRC-	M Stainless steel	S Titanium Alloy, Heat Resistant Alloy	N Copper Alloy	N Aluminum Alloy	Dimensions	Cutting Conditions
SQUARE																	
	For Difficult-to-cut Materials	3	iMX-S3HV	Square head, 3 flute, Irregular helix 	ϕ.375"–ϕ1.000" ϕ10–ϕ25			◎	○			◎	◎	○		I368 I369	I401 I402 I403
		4	iMX-S4HV	Square head, 4 flute, Irregular helix 	ϕ.375"–ϕ1.000" ϕ10–ϕ32			◎	○			◎	◎	○		I370 I371	I404 I405 I406 I407
				Square head, 4 flute, Irregular helix, Long cutting edge type 	— ϕ16, ϕ20		●	◎	○			◎	◎	○		I371	I406
		4	iMX-S4HV-S	Square head, 4 flute, Irregular helix, with coolant hole 	ϕ.375"–ϕ1.000" ϕ10–ϕ25	●		◎	○			◎	◎	○		I372 I373	I404 I405
	For Aluminum Alloys	3	iMX-S3A	Square head, 3 flute, For aluminum alloy 	ϕ.375"–ϕ1.000" ϕ10–ϕ28										◎	I374 I375	I408
RADIUS																	
	For Difficult-to-cut Materials	4	iMX-C4HV	Corner radius head, 4 flute, Irregular helix 	ϕ.375"–ϕ1.000" ϕ10–ϕ28			◎	○			◎	◎	○		I376 I377 I378	I404 I405 I406 I407
				Corner radius head, 4 flute, Irregular helix, Long cutting edge type 	— ϕ16, ϕ20		●									I378	I406
		4	iMX-C4HV-S	Corner radius head, 4 flute, Irregular helix, with coolant hole 	ϕ.375"–ϕ1.000" ϕ10–ϕ25	●		◎	○			◎	◎	○		I380 I381	I404 I405
		6	iMX-C6HV	Corner radius head, Multi-flute, Irregular helix 	ϕ.375"–ϕ.500" ϕ10, ϕ12			◎	○			◎	◎			I382	I409
		10	iMX-C10HV		ϕ.625" ϕ16			◎	○			◎	◎			I382	I409
		12	iMX-C12HV		ϕ.750"–ϕ1.000" ϕ20, ϕ25			◎	○			◎	◎			I382	I409
	For High Feed	4	iMX-C4FD-C	Duplex corner radius head, 4 flute, For high feed, with coolant hole 	— ϕ10–ϕ25	●		◎	◎	◎		◎	◎	○		I383	I410
	For High Efficiency Machining	4	iMX-C4FV	Corner radius head for high efficiency machining, 4 flute, Irregular helix 	ϕ.375"–ϕ1.000" ϕ10–ϕ25			◎	◎	◎						I384 I385	I411
	For Aluminum Alloys	3	iMX-C3A	Corner radius head, 3 flute, For aluminum alloy 	ϕ.375"–ϕ1.000" ϕ10–ϕ28										◎	I386 I387	I408

Type	Applications, Features	No. of Flutes	Product Code	Shape	Size Range	Coolant	Long cutting edge	Work Material: P Carbon Steel	P Tool steel	H -55HRC	H 55HRC-	M Stainless steel	S Titanium Alloy, Heat Resistant Alloy	N Copper Alloy	N Aluminum Alloy	Dimensions	Cutting Conditions
ROUGHING																	
	For Difficult-to-cut Materials	**4**	**iMX-R4F**	Roughing head, 4 flute 	ϕ.375"–ϕ1.000" ϕ10–ϕ25			◎	○			◎	◎	○		I388 I389	I412 I413
BALL																	
	For Difficult-to-cut Materials	**4**	**iMX-B4HV**	Ball nose head, 4 flute, Irregular curve 	ϕ.375"–ϕ1.000" ϕ10–ϕ25			◎	○			◎	◎	○		I390 I391	I414
		4	**iMX-B4HV-E**	Ball nose head, 4 flute, Irregular curve, with coolant hole 	ϕ.375"–ϕ1.000" ϕ10–ϕ25	●		◎	○			◎	◎	○		I392 I393	I414
		6	**iMX-B6HV**	Ball nose head, 6 flute, Irregular curve 	ϕ.375"–ϕ1.000" ϕ10–ϕ25			◎	○			◎	◎			I394 I395	I415

HOLDER

The undercut type holders are available in medium, semi-long, and long lengths.

Type		Length	Taper Angle	Material	Dimensions
Under cut (Inch, Metric)		Medium Semi-long Long	—	Carbide	I396 I397
Straight (Metric)		Semi-long Long	—	Carbide	I397
Taper neck (Inch, Metric)		Long	1°	Carbide	I396 I397

IDENTIFICATION

iMX END MILL SERIES

HEAD

② Basic configurations	
S	Square
C	Corner radius
B	Ball nose
R	Roughing

④ Specifications	
H	High helix
V	Vibration control
F	For High Efficiency Machining
A	For Aluminum Alloys
D	Duplex corner radius
F	Fine pitch (Roughing)

⑥ Corner R. (mm)
ex.
R050 → 0.5mm
R100 → 1mm

⑥ Corner R. (inch)
ex.
R030 → .030inch

⑧ Coolant hole	
S	Peripheral(Side)
E	End
C	End face, Center
None	without hole

IMX12	C	4	HV	120	R100	12	S
①	②	③	④	⑤	⑥	⑦	⑧

① Series Description Head & Holder Combination

Head Series Description	Holder Series Description
iMX 10 -	iMX 10 -
iMX 12 -	iMX 12 -
iMX 16 -	iMX 16 -
iMX 20 -	iMX 20 -
iMX 25 -	iMX 25 -

Head & holder combination should be the same.

③ No. of Flutes
ex.
4 → 4 flute

⑤ Dia. (mm)
ex.
120 → 12mm

⑤ Dia. (inch)
ex.
0500 → .5inch

⑦ Flute length (mm)
ex.
12 → 12.∗mm
(Truncate decimal places)

⑦ Flute length (inch)
ex.
M → Medium = 1DC
P → 0.8DC
(DC=external diameter)

CARBIDE HOLDER

② Hyphen
Hyphen Indicates these are holders.

③ Figure	
U	Undercut
S	Straight
A	1° Taper neck

⑥ Overall Length (mm)
ex.
L080 → 80mm

⑥ Overall Length (inch)
ex.
L31 → 3.1∗inch
(Two digits decimal place truncate)

IMX12	-	U	12	N017	L080	C
①	②	③	④	⑤	⑥	⑦

① Series Description Holder & Head Combination

Holder Series Description	Head Series Description
iMX 10 -	iMX 10 -
iMX 12 -	iMX 12 -
iMX 16 -	iMX 16 -
iMX 20 -	iMX 20 -
iMX 25 -	iMX 25 -

Holder & head combination should be the same.
For holder details, refer to pages I396 and I397.

④ Shank diameter (mm)
ex.
12 → 12mm

④ Shank diameter (inch)
ex.
0500 → .5inch

⑤ Neck Length (mm)
ex.
N17 → 17.∗mm
(Truncate decimal places)

⑤ Neck Length (inch)
ex.
N071 → .71∗inch
(Three digits decimal place truncate)

⑦ Tool material	
C	CARBIDE

∗ For holder details, refer to pages I396 and I397

RUN-OUT ACCURACY AND HEAD EXCHANGE ACCURACY

Unit : inch

Run-out accuracy for the peripheral cutting edge	Head exchange accuracy (Axial)
.0006 (ø10~20)	±.0008
.0008 (ø25)	

Note: Dimension symbols conforming to ISO13399.
See pages PR3-PR6 for details.

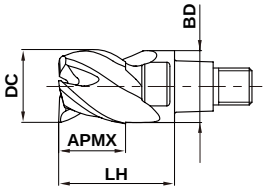
Memo

iMX-S3HV – Inch sizes NEW

Square head, 3 flute, Irregular helix

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





Type1

DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- 3-flute end mills suitable for side milling, slotting and plunging.
- Irregular helix controls vibration and achieves stable machining.

Unit : inch

Order Number	DC	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10S3HV0375P	.375	.320	.630	.363	3	●	1
IMX12S3HV0500P	.500	.420	.789	.488	3	●	1
IMX16S3HV0625P	.625	.520	.945	.605	3	●	1
IMX20S3HV0750P	.750	.650	1.181	.730	3	●	1
IMX25S3HV1000P	1.000	.850	1.500	.980	3	●	1

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

● : Inventory maintained.

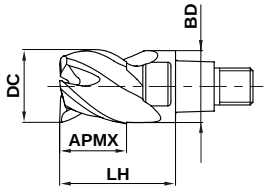
CUTTING CONDITIONS ➤ I401—I403

iMX-S3HV – Metric sizes NEW

Square head, 3 flute, Irregular helix

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





Type1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- 3-flute end mills suitable for side milling, slotting and plunging.
- Irregular helix controls vibration and achieves stable machining.

Unit : mm

Order Number	DC	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10S3HV10008	10	8.5	16	9.7	3	●	1
IMX**12S3HV12010**	12	10.1	19	11.7	3	●	1
IMX**16S3HV16013**	16	13.3	24	15.5	3	●	1
IMX**20S3HV20017**	20	17	30	19.5	3	●	1
IMX**25S3HV25021**	25	21	37.5	24.5	3	●	1

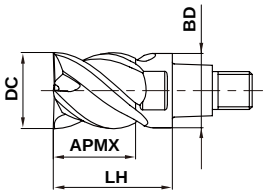
* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

iMX-S4HV – Inch sizes NEW

Square head, 4 flute, Irregular helix

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





Type1

DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- Irregular helix controls vibration and achieves stable machining even when machining of difficult-to-cut materials and for applications with a long overhang.

Unit : inch

Order Number	DC	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10S4HV0375M	.375	.395	.630	.363	4	●	1
IMX12S4HV0500M	.500	.520	.789	.488	4	●	1
IMX16S4HV0625M	.625	.645	.945	.605	4	●	1
IMX20S4HV0750M	.750	.800	1.181	.730	4	●	1
IMX25S4HV1000M	1.000	1.050	1.500	.980	4	●	1

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

● : Inventory maintained.

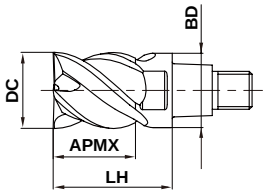
CUTTING CONDITIONS ➤ I404–I407

iMX-S4HV – Metric sizes NEW

Square head, 4 flute, Irregular helix

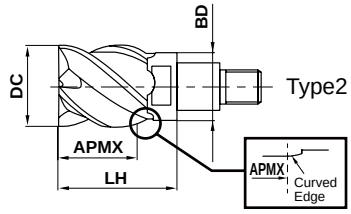
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





Type1

Oversize Type



Type2

*See note 1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			

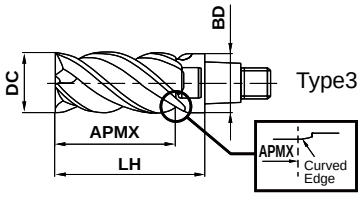
● Irregular helix controls vibration and achieves stable machining even when machining of difficult-to-cut materials and for applications with a long overhang.

Unit : mm

Order Number	DC	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10S4HV10010	10	10.5	16	9.7	4	●	1
IMX10S4HV12012	12	12.5	19	9.7	4	●	2
IMX12S4HV12012	12	12.5	19	11.7	4	●	1
IMX12S4HV14014	14	14.5	22.5	11.7	4	●	2
IMX16S4HV16016	16	16.5	24	15.5	4	●	1
IMX16S4HV18018	18	18.5	27	15.5	4	●	2
IMX20S4HV20021	20	21	30	19.5	4	●	1
IMX20S4HV22023	22	23	33	19.5	4	●	2
IMX25S4HV25026	25	26	37.5	24.5	4	●	1
IMX25S4HV28029	28	29	41.5	24.5	4	●	2
IMX25S4HV30031	30	31	43.5	24.5	4	●	2
IMX25S4HV32033	32	33	45.5	24.5	4	●	2

CUTTING CONDITIONS ➤ I404–I407





Type3

Long cutting edge type

Unit : mm

Order Number	DC	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX16S4HV16032	16	32	40	15.5	4	●	3
IMX20S4HV20040	20	40	50	19.5	4	●	3

1) A curved edge at the shank side of the flute is used in some of our new iMX heads. This feature allows deep faces to be finished in steps, minimizes the blend mark between steps, and provides a good surface finish.

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

CUTTING CONDITIONS ➤ I406

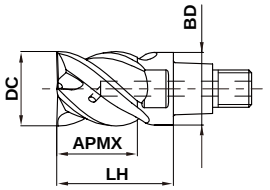
iMX-S4HV-S – Inch sizes NEW

Square head, 4 flute, Irregular helix, with coolant hole

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



(Peripheral cutting edge with coolant hole)



Type1

(Peripheral cutting edge with coolant hole)

DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- Coolant thru design allows for effective chip evacuation.
- Irregular helix controls vibration and achieves stable machining.

Unit : inch

Order Number	DC	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10S4HV0375MS	.375	.395	.630	.363	4	●	1
IMX12S4HV0500MS	.500	.520	.789	.488	4	●	1
IMX16S4HV0625MS	.625	.645	.945	.605	4	●	1
IMX20S4HV0750MS	.750	.800	1.181	.730	4	●	1
IMX25S4HV1000MS	1.000	1.050	1.500	.980	4	●	1

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

● : Inventory maintained.

CUTTING CONDITIONS ➤ I404, I405

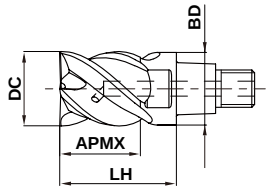
iMX-S4HV-S – Metric sizes NEW

Square head, 4 flute, Irregular helix, with coolant hole

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



(Peripheral cutting edge with coolant hole)



Type1

(Peripheral cutting edge with coolant hole)

DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- Coolant thru design allows for effective chip evacuation.
- Irregular helix controls vibration and achieves stable machining.

Unit : mm

Order Number	DC	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10S4HV10010S	10	10.5	16	9.7	4	●	1
IMX**12S4HV12012S**	12	12.5	19	11.7	4	●	1
IMX**16S4HV16016S**	16	16.5	24	15.5	4	●	1
IMX**20S4HV20021S**	20	21	30	19.5	4	●	1
IMX**25S4HV25026S**	25	26	37.5	24.5	4	●	1

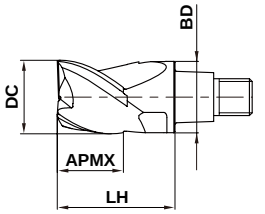
* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

iMX-S3A – Inch sizes NEW

Square head, 3 flute, For aluminum alloy

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎





Type1

DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- High efficiency machining is possible due to the polished rake face and sharp cutting edge.

Unit : inch

Order Number	DC	APMX	LH	BD	No. of Flutes	Grade ET2020	Type
IMX10S3A0375P	.375	.320	.630	.363	3	●	1
IMX12S3A0500P	.500	.420	.789	.488	3	●	1
IMX16S3A0625P	.625	.520	.945	.605	3	●	1
IMX20S3A0750P	.750	.650	1.181	.730	3	●	1
IMX25S3A1000P	1.000	.850	1.500	.980	3	●	1

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

● : Inventory maintained.

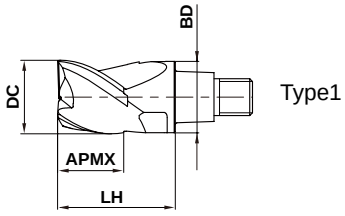
CUTTING CONDITIONS ➤ I408

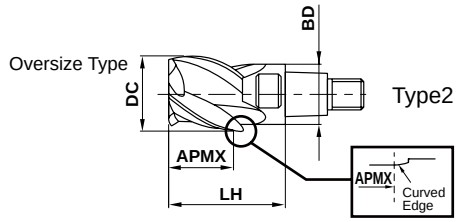
iMX-S3A – Metric sizes NEW

Square head, 3 flute, For aluminum alloy

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎







*See note 1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			

● High efficiency machining is possible due to the polished rake face and sharp cutting edge.

Unit : mm

Order Number	DC	APMX	LH	BD	No. of Flutes	Grade ET2020	Type
IMX10S3A10008	10	8.5	16	9.7	3	●	1
IMX**10S3A12010**	12	10.1	19	9.7	3	●	2
IMX**12S3A12010**	12	10.1	19	11.7	3	●	1
IMX**12S3A14011**	14	11.7	22.5	11.7	3	●	2
IMX**16S3A16013**	16	13.3	24	15.5	3	●	1
IMX**16S3A18014**	18	14.9	27	15.5	3	●	2
IMX**20S3A20017**	20	17	30	19.5	3	●	1
IMX**20S3A22018**	22	18.6	33	19.5	3	●	2
IMX**25S3A25021**	25	21	37.5	24.5	3	●	1
IMX**25S3A28023**	28	23.4	41.5	24.5	3	●	2

1) A curved edge at the shank side of the flute is used in some of our new iMX heads. This feature allows deep faces to be finished in steps, minimizes the blend mark between steps, and provides a good surface finish.

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

iMX-C4HV – Inch sizes NEW

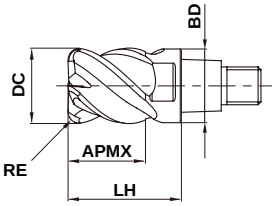
Corner radius head, 4 flute, Irregular helix

UWC

42°
45°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





Type1

R				
±.0008"				
DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

● Vibration control corner radius type achieves stable machining of difficult-to-cut materials and is suitable for long overhang applications due to the irregular helix.

Unit : inch

Order Number	DC	RE	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10C4HV0375R015M	.375	.015	.395	.630	.363	4	●	1
IMX**10C4HV0375R030M**	.375	.030	.395	.630	.363	4	●	1
IMX**10C4HV0375R060M**	.375	.060	.395	.630	.363	4	●	1
IMX**12C4HV0500R015M**	.500	.015	.520	.789	.488	4	●	1
IMX**12C4HV0500R030M**	.500	.030	.520	.789	.488	4	●	1
IMX**12C4HV0500R060M**	.500	.060	.520	.789	.488	4	●	1
IMX**16C4HV0625R015M**	.625	.015	.645	.945	.605	4	●	1
IMX**16C4HV0625R030M**	.625	.030	.645	.945	.605	4	●	1
IMX**16C4HV0625R060M**	.625	.060	.645	.945	.605	4	●	1
IMX**20C4HV0750R030M**	.750	.030	.800	1.181	.730	4	●	1
IMX**20C4HV0750R060M**	.750	.060	.800	1.181	.730	4	●	1
IMX**20C4HV0750R125M**	.750	.125	.800	1.181	.730	4	●	1
IMX**20C4HV0750R190M**	.750	.190	.800	1.181	.730	4	●	1
IMX**20C4HV0750R250M**	.750	.250	.800	1.181	.730	4	●	1
IMX**25C4HV1000R030M**	1.000	.030	1.050	1.500	.980	4	●	1
IMX**25C4HV1000R060M**	1.000	.060	1.050	1.500	.980	4	●	1
IMX**25C4HV1000R125M**	1.000	.125	1.050	1.500	.980	4	●	1
IMX**25C4HV1000R190M**	1.000	.190	1.050	1.500	.980	4	●	1
IMX**25C4HV1000R250M**	1.000	.250	1.050	1.500	.980	4	●	1

∗ The series of the head and holder should be the same. (refer to page I366, I396 or I397)

● : Inventory maintained.

CUTTING CONDITIONS ➤ I404–I407

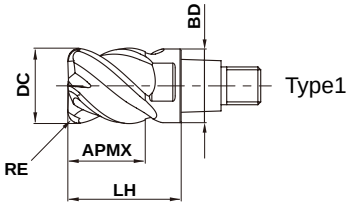
iMX-C4HV – Metric sizes NEW

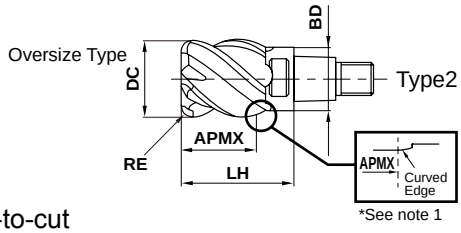
Corner radius head, 4 flute, Irregular helix

UWC 42° 45°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	







*See note 1

R					
	±0.020				
	DC ≤12	DC>12			
	0 - 0.020	0 - 0.030			

● Vibration control corner radius type achieves stable machining of difficult-to-cut materials and is suitable for long overhang applications due to the irregular helix.

Unit : mm

Order Number	DC	RE	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10C4HV100R05010	10	0.5	10.5	16	9.7	4	●	1
IMX**10C4HV100R10010**	10	1	10.5	16	9.7	4	●	1
IMX**10C4HV100R15010**	10	1.5	10.5	16	9.7	4	●	1
IMX**10C4HV100R20010**	10	2	10.5	16	9.7	4	●	1
IMX**10C4HV100R25010**	10	2.5	10.5	16	9.7	4	●	1
IMX**10C4HV100R30010**	10	3	10.5	16	9.7	4	●	1
IMX**10C4HV120R10012**	12	1	12.5	19	9.7	4	●	2
IMX**10C4HV120R20012**	12	2	12.5	19	9.7	4	●	2
IMX**12C4HV120R05012**	12	0.5	12.5	19	11.7	4	●	1
IMX**12C4HV120R10012**	12	1	12.5	19	11.7	4	●	1
IMX**12C4HV120R15012**	12	1.5	12.5	19	11.7	4	●	1
IMX**12C4HV120R20012**	12	2	12.5	19	11.7	4	●	1
IMX**12C4HV120R25012**	12	2.5	12.5	19	11.7	4	●	1
IMX**12C4HV120R30012**	12	3	12.5	19	11.7	4	●	1
IMX**12C4HV120R40012**	12	4	12	19	11.7	4	●	1
IMX**12C4HV140R10014**	14	1	14.5	22.5	11.7	4	●	2
IMX**12C4HV140R20014**	14	2	14.5	22.5	11.7	4	●	2
IMX**16C4HV160R05016**	16	0.5	16.5	24	15.5	4	●	1
IMX**16C4HV160R10016**	16	1	16.5	24	15.5	4	●	1
IMX**16C4HV160R15016**	16	1.5	16.5	24	15.5	4	●	1
IMX**16C4HV160R20016**	16	2	16.5	24	15.5	4	●	1
IMX**16C4HV160R25016**	16	2.5	16.5	24	15.5	4	●	1
IMX**16C4HV160R30016**	16	3	16.5	24	15.5	4	●	1
IMX**16C4HV160R40016**	16	4	16.5	24	15.5	4	●	1
IMX**16C4HV160R50016**	16	5	16.5	24	15.5	4	●	1
IMX**16C4HV180R10018**	18	1	18.5	27	15.5	4	●	2
IMX**16C4HV180R30018**	18	3	18.5	27	15.5	4	●	2
IMX**20C4HV200R05021**	20	0.5	21	30	19.5	4	●	1
IMX**20C4HV200R10021**	20	1	21	30	19.5	4	●	1
IMX**20C4HV200R15021**	20	1.5	21	30	19.5	4	●	1

iMX-C4HV – Metric sizes NEW

Corner radius head, 4 flute, Irregular helix

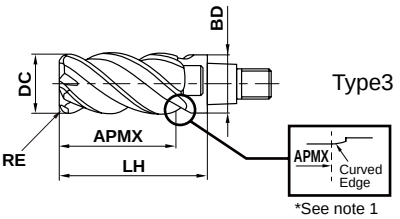
Unit : mm

Order Number	DC	RE	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX20C4HV200R20021	20	2	21	30	19.5	4	●	1
IMX**20C4HV200R25021**	20	2.5	21	30	19.5	4	●	1
IMX**20C4HV200R30021**	20	3	21	30	19.5	4	●	1
IMX**20C4HV200R40021**	20	4	21	30	19.5	4	●	1
IMX**20C4HV200R50021**	20	5	21	30	19.5	4	●	1
IMX**20C4HV200R63521**	20	6.35	21	30	19.5	4	●	1
IMX**20C4HV220R10023**	22	1	23	33	19.5	4	●	2
IMX**20C4HV220R30023**	22	3	23	33	19.5	4	●	2
IMX**25C4HV250R10026**	25	1	26	37.5	24.5	4	●	1
IMX**25C4HV250R20026**	25	2	26	37.5	24.5	4	●	1
IMX**25C4HV250R30026**	25	3	26	37.5	24.5	4	●	1
IMX**25C4HV250R40026**	25	4	26	37.5	24.5	4	●	1
IMX**25C4HV250R50026**	25	5	26	37.5	24.5	4	●	1
IMX**25C4HV250R63526**	25	6.35	26	37.5	24.5	4	●	1
IMX**25C4HV280R10029**	28	1	29	41.5	24.5	4	●	2
IMX**25C4HV280R30029**	28	3	29	41.5	24.5	4	●	2

1) A curved edge at the shank side of the flute is used in some of our new iMX heads. This feature allows deep faces to be finished in steps, minimizes the blend mark between steps, and provides a good surface finish.

CUTTING CONDITIONS ➤ I404–I407





Type3

*See note 1

Long cutting edge type

Unit : mm

Order Number	DC	RE	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX16C4HV160R10032	16	1	32	40	15.5	4	●	3
IMX**16C4HV160R30032**	16	3	32	40	15.5	4	●	3
IMX**20C4HV200R10040**	20	1	40	50	19.5	4	●	3
IMX**20C4HV200R30040**	20	3	40	50	19.5	4	●	3

1) A curved edge at the shank side of the flute is used in some of our new iMX heads. This feature allows deep faces to be finished in steps, minimizes the blend mark between steps, and provides a good surface finish.

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

● : Inventory maintained.

CUTTING CONDITIONS ➤ I406

Memo

iMX-C4HV-S – Inch sizes NEW

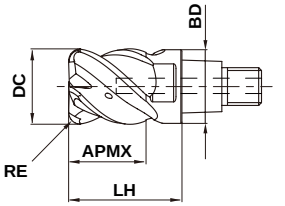
Corner radius head, 4 flute, Irregular helix, with coolant hole

UWC 42° 45°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



(Peripheral cutting edge with coolant hole)



Type1

(Peripheral cutting edge with coolant hole)

R					
	±.0008"				
	DC≤.500"	DC>.500"			
	0 - .0008"	0 - .0012"			

- Coolant thru design allows for effective chip evacuation.
- Vibration control corner radius type for stable machining of difficult-to-cut materials and long overhang applications due to the irregular helix.

Unit : inch

Order Number	DC	RE	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10C4HV0375R030MS	.375	.030	.395	.630	.363	4	●	1
IMX12C4HV0500R030MS	.500	.030	.520	.789	.488	4	●	1
IMX16C4HV0625R030MS	.625	.030	.645	.945	.605	4	●	1
IMX20C4HV0750R030MS	.750	.030	.800	1.181	.730	4	●	1
IMX25C4HV1000R030MS	1.000	.030	1.050	1.500	.980	4	●	1

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

● : Inventory maintained.

CUTTING CONDITIONS ➤ I404, I405

iMX-C4HV-S – Metric sizes NEW

Corner radius head, 4 flute, Irregular helix, with coolant hole

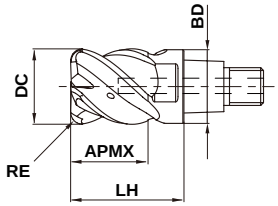
UWC

42°
45°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



(Peripheral cutting edge with coolant hole)



Type1

(Peripheral cutting edge with coolant hole)

R					
	±0.020				
	DC≤12	DC>12			
	0 - 0.020	0 - 0.030			

- Coolant thru design allows for effective chip evacuation.
- Vibration control corner radius type for stable machining of difficult-to-cut materials and long overhang applications due to the irregular helix.

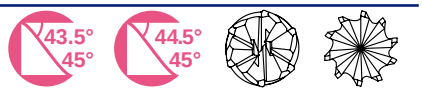
Unit : mm

Order Number	DC	RE	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10C4HV100R10010S	10	1	10.5	16	9.7	4	●	1
IMX12C4HV120R10012S	12	1	12.5	19	11.7	4	●	1
IMX16C4HV160R10016S	16	1	16.5	24	15.5	4	●	1
IMX20C4HV200R10021S	20	1	21	30	19.5	4	●	1
IMX25C4HV250R10026S	25	1	26	37.5	24.5	4	●	1

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

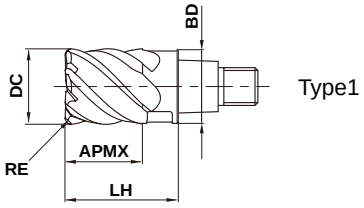
iMX-C6HV/C10HV/C12HV – Inch sizes NEW UWC

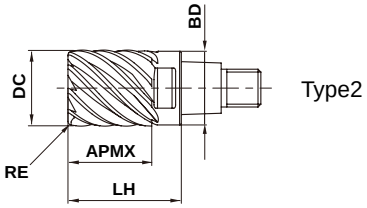
Corner radius head, Multi-flute, Irregular helix



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎		







R				
±.0008"				
DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- High machining efficiency due to multi-flute design.
- Irregular helix controls vibration and achieves stable machining.

Unit : inch

Order Number	DC	RE	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10C6HV0375R030M	.375	.030	.395	.630	.363	6	●	1
IMX**12C6HV0500R030M**	.500	.030	.520	.789	.488	6	●	1
IMX**16C10HV0625R030M**	.625	.030	.645	.945	.605	10	●	2
IMX**20C12HV0750R030M**	.750	.030	.800	1.181	.730	12	●	2
IMX**25C12HV1000R030M**	1.000	.030	1.050	1.500	.980	12	●	2

∗ The series of the head and holder should be the same. (refer to page I366, I396 or I397)

CUTTING CONDITIONS ➤ I409

iMX-C6HV/C10HV/C12HV – Metric sizes NEW UWC

Corner radius head, Multi-flute, Irregular helix



R				
±0.020				
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- High machining efficiency due to multi-flute design.
- Irregular helix controls vibration and achieves stable machining.

Unit : mm

Order Number	DC	RE	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10C6HV100R05010	10	0.5	10.5	16	9.7	6	●	1
IMX**10C6HV100R10010**	10	1	10.5	16	9.7	6	●	1
IMX**12C6HV120R10012**	12	1	12.5	19	11.7	6	●	1
IMX**16C10HV160R10016**	16	1	16.5	24	15.5	10	●	2
IMX**20C12HV200R10021**	20	1	21	30	19.5	12	●	2
IMX**25C12HV250R10026**	25	1	26	37.5	24.5	12	●	2

∗ The series of the head and holder should be the same. (refer to page I366, I396 or I397)

● : Inventory maintained.

CUTTING CONDITIONS ➤ I409

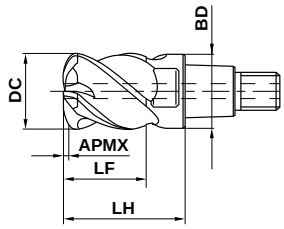
iMX-C4FD-C – Metric sizes NEW

Duplex corner radius head, 4 flute, For high feed, with coolant hole

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎		◎	◎	○	



(End mill with end face center coolant hole)



(End mill with end face center coolant hole)

DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- The duplex corner radius and 4 flute geometry enables efficient machining at higher feed rates.
- End face center coolant hole provides a stable supply of coolant.

Unit : mm

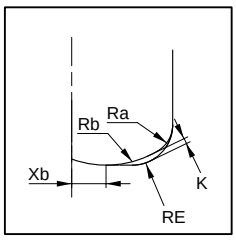
Order Number	DC	RE *1	APMX	LF	LH	BD	No. of Flutes	RMPX *2	Grade EP7020	Type
IMX10C4FD10010C	10	1.99	0.7	10.5	16	9.7	4	2.1	●	1
IMX12C4FD12012C	12	2.1	0.8	12.5	19	11.7	4	2.8	●	1
IMX16C4FD16016C	16	2.75	1	16.5	24	15.5	4	3	●	1
IMX20C4FD20021C	20	3.07	1.3	21	30	19.5	4	3.3	●	1
IMX25C4FD25026C	25	4.21	1.6	26	37.5	24.5	4	4.5	●	1

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

* Duplex corner radius end mill is not suitable for corner radius machining due to the possibility of leaving unmachined areas.

*1 RE : Approximate Radius
*2 RMPX : Max. Ramping Angle

Order Number	RE *1	Duplex corner radius			
		K	Xb	Ra	Rb
IMX10C4FD10010C	1.99	0.27	1.7	1.5	5
IMX12C4FD12012C	2.1	0.33	2.25	1.5	6
IMX16C4FD16016C	2.75	0.42	3.1	2	8
IMX20C4FD20021C	3.07	0.59	4	2	10
IMX25C4FD25026C	4.21	0.67	5	3	12



*Note for programing
Approximate Radius = RE
Uncut portion =K

iMX-C4FV– Inch sizes NEW

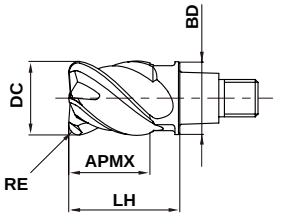
Corner radius head for high efficiency machining, 4 flute, Irregular helix

UWC

43°
45°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≦45HRC)	Hardened Steel (≦55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎					





Type1

R					
	DC≦.750"	DC>.750"			
	±.0004"	±.0008"			
	DC≦.500"	DC>.500"			
	0 - .0008"	0 - .0012"			

- Corner radius end mill for high efficiency machining
- Irregular helix controls vibration and achieves stable machining.

Unit : inch

Order Number	DC	RE	APMX	LH	BD	No. of Flutes	Grade EP6120	Type
IMX10C4FV0375R090M	.375	.090	.395	.630	.363	4	●	1
IMX12C4FV0500R090M	.500	.090	.520	.789	.488	4	●	1
IMX16C4FV0625R125M	.625	.125	.645	.945	.605	4	●	1
IMX20C4FV0750R125M	.750	.125	.800	1.181	.730	4	●	1
IMX25C4FV1000R190M	1.000	.190	1.050	1.500	.980	4	●	1

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

● : Inventory maintained.

CUTTING CONDITIONS ➤ I411

iMX-C4FV – Metric sizes NEW

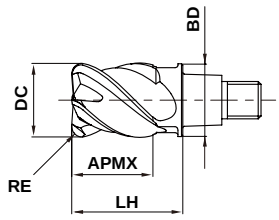
Corner radius head for high efficiency machining, 4 flute, Irregular helix

UWC

43°
45°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎					





Type1

R	DC≤20	DC>20			
	±0.010	±0.020			
	DC≤12	DC>12			
	0 - 0.020	0 - 0.030			

- Corner radius end mill for high efficiency machining
- Irregular helix controls vibration and achieves stable machining.

Unit : mm

Order Number	DC	RE	APMX	LH	BD	No. of Flutes	Grade EP6120	Type
IMX10C4FV100R20010	10	2	10.5	16	9.7	4	●	1
IMX**12C4FV120R20012**	12	2	12.5	19	11.7	4	●	1
IMX**16C4FV160R30016**	16	3	16.5	24	15.5	4	●	1
IMX**20C4FV200R30021**	20	3	21	30	19.5	4	●	1
IMX**25C4FV250R40026**	25	4	26	37.5	24.5	4	●	1

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

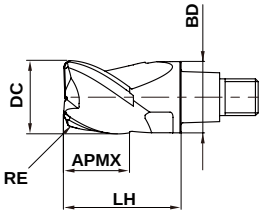
iMX-C3A – Inch sizes NEW

Corner radius head, 3 flute, For aluminum alloy

UWC 37.5°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎





Type1

R					
	±.0008"				
	DC≤.500"	DC>.500"			
	0 - .0008"	0 - .0012"			

● High efficiency machining is possible due to polished rake face and sharp cutting edge.

Unit : inch

Order Number	DC	RE	APMX	LH	BD	No. of Flutes	Grade ET2020	Type
IMX10C3A0375R015P	.375	.015	.320	.630	.363	3	●	1
IMX10C3A0375R030P	.375	.030	.320	.630	.363	3	●	1
IMX12C3A0500R015P	.500	.015	.420	.789	.488	3	●	1
IMX12C3A0500R030P	.500	.030	.420	.789	.488	3	●	1
IMX16C3A0625R030P	.625	.030	.520	.945	.605	3	●	1
IMX16C3A0625R060P	.625	.060	.520	.945	.605	3	●	1
IMX20C3A0750R030P	.750	.030	.650	1.181	.730	3	●	1
IMX20C3A0750R060P	.750	.060	.650	1.181	.730	3	●	1
IMX25C3A1000R060P	1.000	.060	.850	1.500	.980	3	●	1
IMX25C3A1000R125P	1.000	.125	.850	1.500	.980	3	●	1

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

● : Inventory maintained.

CUTTING CONDITIONS ➤ I408

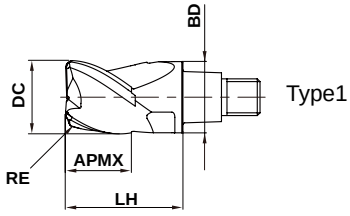
iMX-C3A – Metric sizes NEW

Corner radius head, 3 flute, For aluminum alloy

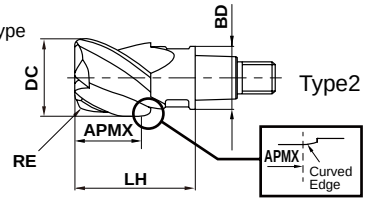
UWC 37.5°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎





Oversize Type



*See note 1

R					
	±0.020				
	DC ≤12	DC>12			
	0 - 0.020	0 - 0.030			

● High efficiency machining is possible due to polished rake face and sharp cutting edge.

Unit : mm

Order Number	DC	RE	APMX	LH	BD	No. of Flutes	Grade ET2020	Type
IMX10C3A100R10008	10	1	8.5	16	9.7	3	●	1
IMX**10C3A100R25008**	10	2.5	8.5	16	9.7	3	●	1
IMX**10C3A120R10010**	12	1	10.1	19	9.7	3	●	2
IMX**12C3A120R10010**	12	1	10.1	19	11.7	3	●	1
IMX**12C3A120R32010**	12	3.2	10.1	19	11.7	3	●	1
IMX**12C3A140R10011**	14	1	11.7	22.5	11.7	3	●	2
IMX**16C3A160R10013**	16	1	13.3	24	15.5	3	●	1
IMX**16C3A160R32013**	16	3.2	13.3	24	15.5	3	●	1
IMX**16C3A180R32014**	18	3.2	14.9	27	15.5	3	●	2
IMX**20C3A200R10017**	20	1	17	30	19.5	3	●	1
IMX**20C3A200R32017**	20	3.2	17	30	19.5	3	●	1
IMX**20C3A220R32018**	22	3.2	18.6	33	19.5	3	●	2
IMX**25C3A250R10020**	25	1	20	37.5	24.5	3	●	2
IMX**25C3A250R32021**	25	3.2	21	37.5	24.5	3	●	1
IMX**25C3A250R50021**	25	5	21	37.5	24.5	3	●	1
IMX**25C3A280R32023**	28	3.2	23.4	41.5	24.5	3	●	2

1) A curved edge at the shank side of the flute is used in some of our new iMX heads. This feature allows deep faces to be finished in steps, minimizes the blend mark between steps, and provides a good surface finish.

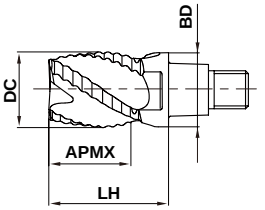
* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

iMX-R4F – Inch sizes NEW

Roughing head, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





Type1

- The roughing edge geometry reduces cutting resistance.
  Effective when rigidity of the machine or work piece is low.

Unit : inch

Order Number	DC	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10R4F0375M	.375	.395	.630	.363	4	●	1
IMX12R4F0500M	.500	.520	.789	.488	4	●	1
IMX16R4F0625M	.625	.645	.945	.605	4	●	1
IMX20R4F0750M	.750	.800	1.181	.730	4	●	1
IMX25R4F1000M	1.000	1.050	1.500	.980	4	●	1

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

● : Inventory maintained.

CUTTING CONDITIONS ➤ I412, I413

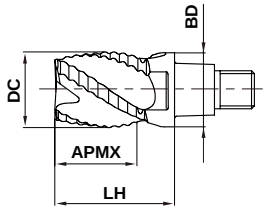
iMX-R4F – Metric sizes NEW

Roughing head, 4 flute

UWC 35°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≦45HRC)	Hardened Steel (≦55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





Type1

- The roughing edge geometry reduces cutting resistance.
  Effective when rigidity of the machine or work piece is low.

Unit : mm

Order Number	DC	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10R4F10010	10	10.5	16	9.7	4	●	1
IMX**12R4F12012**	12	12.5	19	11.7	4	●	1
IMX**16R4F16016**	16	16.5	24	15.5	4	●	1
IMX**20R4F20021**	20	21	30	19.5	4	●	1
IMX**25R4F25026**	25	26	37.5	24.5	4	●	1

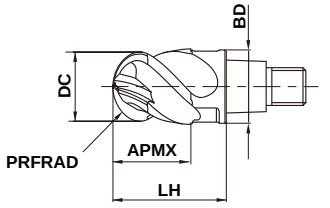
* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

iMX-B4HV– Inch sizes NEW

Ball nose head, 4 flute, Irregular curve

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





Type1

R	DC≤.500"	DC>.500"			
	±.0004"	±.0008"			
	DC≤.500"	DC>.500"			
	0 - .0008"	0 - .0012"			

● Irregular curve cutting edge controls vibration and achieves stable machining of difficult-to-cut materials and is suitable for long overhang applications.

Unit : inch

Order Number	PRFRAD	DC	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10B4HV0375M	.1875	.375	.395	.630	.363	4	●	1
IMX12B4HV0500M	.2500	.500	.520	.789	.488	4	●	1
IMX16B4HV0625M	.3125	.625	.645	.945	.605	4	●	1
IMX20B4HV0750M	.3750	.750	.800	1.181	.730	4	●	1
IMX25B4HV1000M	.5000	1.000	1.050	1.500	.980	4	●	1

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

● : Inventory maintained.

CUTTING CONDITIONS ➤ I414

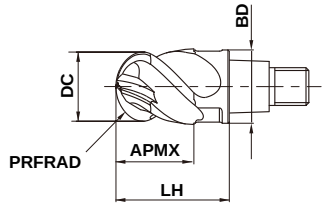
iMX-B4HV – Metric sizes NEW

Ball nose head, 4 flute, Irregular curve

UWC 45°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





Type1

R	DC≤12	DC>12			
	±0.010	±0.020			
	DC≤12	DC>12			
	0 - 0.020	0 - 0.030			

● Irregular curve cutting edge controls vibration and achieves stable machining of difficult-to-cut materials and is suitable for long overhang applications.

Unit : mm

Order Number	PRFRAD	DC	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10B4HV10010	5	10	10.5	16	9.7	4	●	1
IMX12B4HV12012	6	12	12.5	19	11.7	4	●	1
IMX16B4HV16016	8	16	16.5	24	15.5	4	●	1
IMX20B4HV20021	10	20	21	30	19.5	4	●	1
IMX25B4HV25026	12.5	25	26	37.5	24.5	4	●	1

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

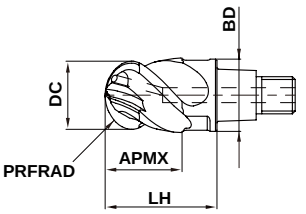
iMX-B4HV-E – Inch sizes NEW

Ball nose head, 4 flute, Irregular curve, with coolant hole

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



(End cutting edge with coolant hole)



Type1

(End cutting edge with coolant hole)

R	DC≤.500"	DC>.500"			
	±.0004"	±.0008"			
	DC≤.500"	DC>.500"			
	0 - .0008"	0 - .0012"			

- Coolant thru design allows for effective chip evacuation.
- Irregular curve cutting edge controls vibration and achieves stable machining of difficult-to-cut materials and is suitable for long overhang applications.

Unit : inch

Order Number	PRFRAD	DC	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10B4HV0375ME	.1875	.375	.395	.630	.363	4	●	1
IMX12B4HV0500ME	.2500	.500	.520	.789	.488	4	●	1
IMX16B4HV0625ME	.3125	.625	.645	.945	.605	4	●	1
IMX20B4HV0750ME	.3750	.750	.800	1.181	.730	4	●	1
IMX25B4HV1000ME	.5000	1.000	1.050	1.500	.980	4	●	1

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

● : Inventory maintained.

CUTTING CONDITIONS ➤ I414

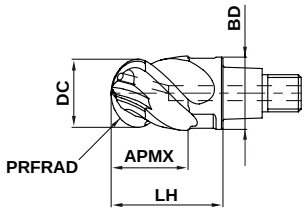
iMX-B4HV-E – Metric sizes NEW

Ball nose head, 4 flute, Irregular curve, with coolant hole

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



(End cutting edge with coolant hole)



Type1

(End cutting edge with coolant hole)

R	DC≤12	DC>12			
	±0.010	±0.020			
	DC≤12	DC>12			
	0 - 0.020	0 - 0.030			

- Coolant thru design allows for effective chip evacuation.
- Irregular curve cutting edge controls vibration and achieves stable machining of difficult-to-cut materials and is suitable for long overhang applications.

Unit : mm

Order Number	PRFRAD	DC	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10B4HV10010E	5	10	10.5	16	9.7	4	●	1
IMX12B4HV12012E	6	12	12.5	19	11.7	4	●	1
IMX16B4HV16016E	8	16	16.5	24	15.5	4	●	1
IMX20B4HV20021E	10	20	21	30	19.5	4	●	1
IMX25B4HV25026E	12.5	25	26	37.5	24.5	4	●	1

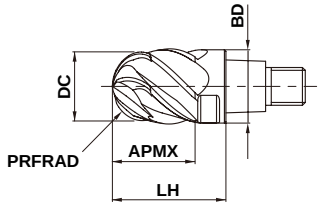
* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

iMX-B6HV – Inch sizes NEW

Ball nose head, 6 flute, Irregular curve

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎		





Type1

R	DC≤.500"	DC>.500"			
	±.0004"	±.0008"			
	DC≤.500"	DC>.500"			
	0 - .0008"	0 - .0012"			

- Irregular curve cutting edge for vibration control and stable machining of difficult-to-cut materials.
- 6 flutes enables high machining efficiency.

Unit : inch

Order Number	PRFRAD	DC	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10B6HV0375M	.1875	.375	.395	.630	.363	6	●	1
IMX12B6HV0500M	.2500	.500	.520	.789	.488	6	●	1
IMX16B6HV0625M	.3125	.625	.645	.945	.605	6	●	1
IMX20B6HV0750M	.3750	.750	.800	1.181	.730	6	●	1
IMX25B6HV1000M	.5000	1.000	1.050	1.500	.980	6	●	1

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

● : Inventory maintained.

CUTTING CONDITIONS ➤I415

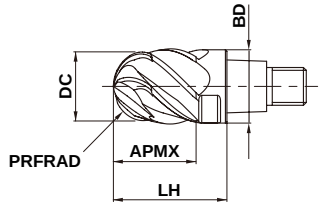
iMX-B6HV – Metric sizes NEW

Ball nose head, 6 flute, Irregular curve

UWC 45°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎		





Type1

R	DC≤12	DC>12			
	±0.010	±0.020			
	DC≤12	DC>12			
	0 - 0.020	0 - 0.030			

- Irregular curve cutting edge for vibration control and stable machining of difficult-to-cut materials.
- 6 flutes enables high machining efficiency.

Unit : mm

Order Number	PRFRAD	DC	APMX	LH	BD	No. of Flutes	Grade EP7020	Type
IMX10B6HV10010	5	10	10.5	16	9.7	6	●	1
IMX12B6HV12012	6	12	12.5	19	11.7	6	●	1
IMX16B6HV16016	8	16	16.5	24	15.5	6	●	1
IMX20B6HV20021	10	20	21	30	19.5	6	●	1
IMX25B6HV25026	12.5	25	26	37.5	24.5	6	●	1

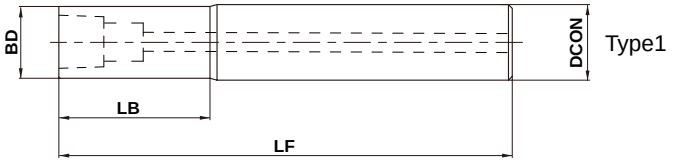
* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

iMX – Inch sizes NEW

Carbide Holder

Undercut

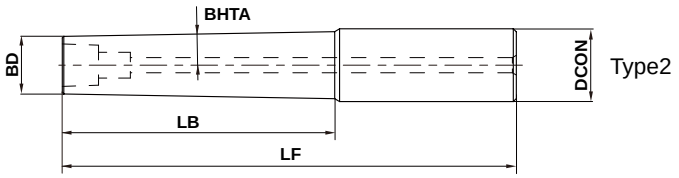




Type1

Taper neck type





Type2

h6	DCON=.375	.500 ≤DCON ≤.625	.750 ≤DCON ≤1.000		
	0 - .00035"	0 - .00043"	0 - .00051"		

Carbide Holder

Unit : inch

Order Number	BHTA	LB	BD	LF	DCON	Stock	Type	Suitable Head	Wrench	Anti-seize Lubricant
IMX10-U0375N049L27C	—	.495	.363	2.755	.375	●	1	IMX10	IMX10-WR	MK1KS
IMX**10-U0375N124L35C**	—	1.245	.363	3.543	.375	●	1	IMX10	IMX10-WR	MK1KS
IMX**10-U0375N199L43C**	—	1.995	.363	4.330	.375	●	1	IMX10	IMX10-WR	MK1KS
IMX**10-A0500N199L43C**	1	1.995	.363	4.330	.500	●	2	IMX10	IMX10-WR	MK1KS
IMX**12-U0500N071L31C**	—	.711	.488	3.149	.500	●	1	IMX12	IMX12-WR	MK1KS
IMX**12-U0500N171L39C**	—	1.711	.488	3.937	.500	●	1	IMX12	IMX12-WR	MK1KS
IMX**12-U0500N271L51C**	—	2.711	.488	5.118	.500	●	1	IMX12	IMX12-WR	MK1KS
IMX**12-A0625N271L51C**	1	2.711	.488	5.118	.625	●	2	IMX12	IMX12-WR	MK1KS
IMX**16-U0625N093L31C**	—	.930	.605	3.149	.625	●	1	IMX16	IMX16-WR	MK1KS
IMX**16-U0625N218L43C**	—	2.180	.605	4.330	.625	●	1	IMX16	IMX16-WR	MK1KS
IMX**16-U0625N343L59C**	—	3.43	.605	5.905	.625	●	1	IMX16	IMX16-WR	MK1KS
IMX**16-A0750N343L59C**	1	3.430	.605	5.905	.750	●	2	IMX16	IMX16-WR	MK1KS
IMX**20-U0750N106L35C**	—	1.069	.730	3.543	.750	●	1	IMX20	IMX20-WR	MK1KS
IMX**20-U0750N256L51C**	—	2.569	.730	5.118	.750	●	1	IMX20	IMX20-WR	MK1KS
IMX**20-U0750N406L70C**	—	4.069	.730	7.086	.750	●	1	IMX20	IMX20-WR	MK1KS
IMX**20-A1000N406L70C**	1	4.069	.730	7.086	1.000	●	2	IMX20	IMX20-WR	MK1KS
IMX**25-U1000N150L43C**	—	1.500	.980	4.330	1.000	●	1	IMX25	IMX25-WR	MK1KS
IMX**25-U1000N350L62C**	—	3.500	.980	6.299	1.000	●	1	IMX25	IMX25-WR	MK1KS

* The series of the head and holder should be the same. (refer to page I366, I396 or I397)

* See page I398 regarding how to install the head

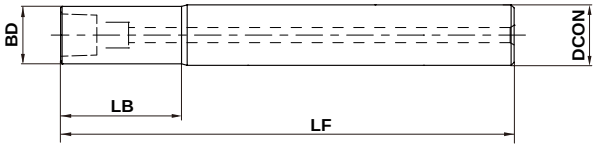
● : Inventory maintained.

iMX – Metric sizes NEW

Carbide Holder

Undercut

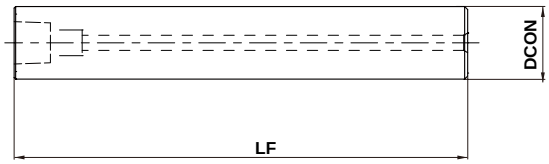




Type1

Straight

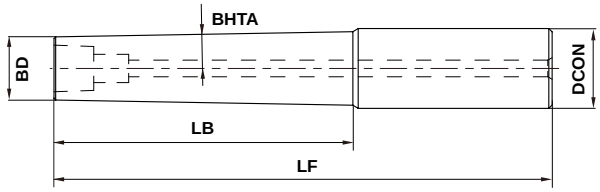




Type2

Taper neck type





Type3

h6

DCON=10	12 ≤DCON ≤16	20 ≤DCON ≤25		
0 - 0.009	0 - 0.011	0 - 0.013		

Carbide Holder

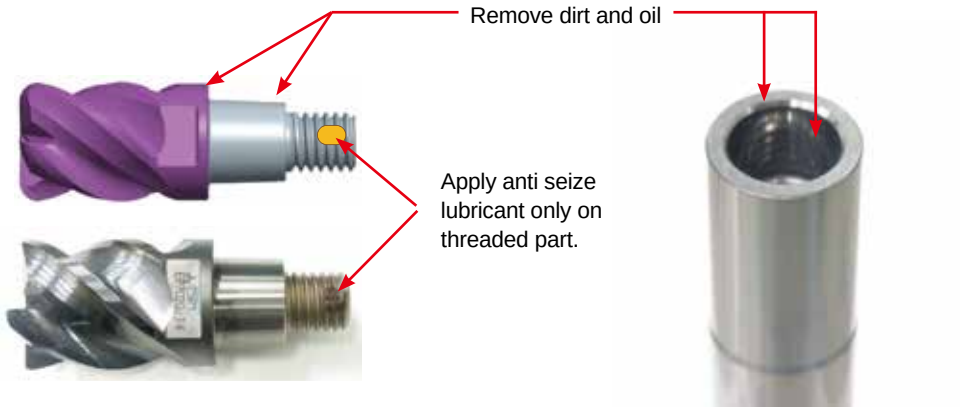
Unit : mm

Order Number	BHTA	LB	BD	LF	DCON	Stock	Type	Suitable Head	Wrench	Anti-seize Lubricant
IMX10-U10N014L070C	–	14	9.7	70	10	●	1	IMX10	IMX10-WR	MK1KS
IMX10-S10L090C	–	–	–	90	10	●	2	IMX10	IMX10-WR	MK1KS
IMX10-U10N034L090C	–	34	9.7	90	10	●	1	IMX10	IMX10-WR	MK1KS
IMX10-S10L110C	–	–	–	110	10	●	2	IMX10	IMX10-WR	MK1KS
IMX10-U10N054L110C	–	54	9.7	110	10	●	1	IMX10	IMX10-WR	MK1KS
IMX10-A12N054L110C	1	54	9.7	110	12	●	3	IMX10	IMX10-WR	MK1KS
IMX12-U12N017L080C	–	17	11.7	80	12	●	1	IMX12	IMX12-WR	MK1KS
IMX12-S12L100C	–	–	–	100	12	●	2	IMX12	IMX12-WR	MK1KS
IMX12-U12N041L100C	–	41	11.7	100	12	●	1	IMX12	IMX12-WR	MK1KS
IMX12-S12L130C	–	–	–	130	12	●	2	IMX12	IMX12-WR	MK1KS
IMX12-U12N065L130C	–	65	11.7	130	12	●	1	IMX12	IMX12-WR	MK1KS
IMX12-A16N065L130C	1	65	11.7	130	16	●	3	IMX12	IMX12-WR	MK1KS
IMX16-U16N024L080C	–	24	15.5	80	16	●	1	IMX16	IMX16-WR	MK1KS
IMX16-S16L110C	–	–	–	110	16	●	2	IMX16	IMX16-WR	MK1KS
IMX16-U16N056L110C	–	56	15.5	110	16	●	1	IMX16	IMX16-WR	MK1KS
IMX16-S16L150C	–	–	–	150	16	●	2	IMX16	IMX16-WR	MK1KS
IMX16-U16N088L150C	–	88	15.5	150	16	●	1	IMX16	IMX16-WR	MK1KS
IMX16-A20N088L150C	1	88	15.5	150	20	●	3	IMX16	IMX16-WR	MK1KS
IMX20-U20N030L090C	–	30	19.5	90	20	●	1	IMX20	IMX20-WR	MK1KS
IMX20-S20L130C	–	–	–	130	20	●	2	IMX20	IMX20-WR	MK1KS
IMX20-U20N070L130C	–	70	19.5	130	20	●	1	IMX20	IMX20-WR	MK1KS
IMX20-S20L180C	–	–	–	180	20	●	2	IMX20	IMX20-WR	MK1KS
IMX20-U20N110L180C	–	110	19.5	180	20	●	1	IMX20	IMX20-WR	MK1KS
IMX20-A25N110L180C	1	110	19.5	180	25	●	3	IMX20	IMX20-WR	MK1KS
IMX25-U25N037L110C	–	37.5	24.5	110	25	●	1	IMX25	IMX25-WR	MK1KS
IMX25-S25L160C	–	–	–	160	25	●	2	IMX25	IMX25-WR	MK1KS
IMX25-U25N087L160C	–	87.5	24.5	160	25	●	1	IMX25	IMX25-WR	MK1KS
IMX25-S25L210C	–	–	–	210	25	●	2	IMX25	IMX25-WR	MK1KS

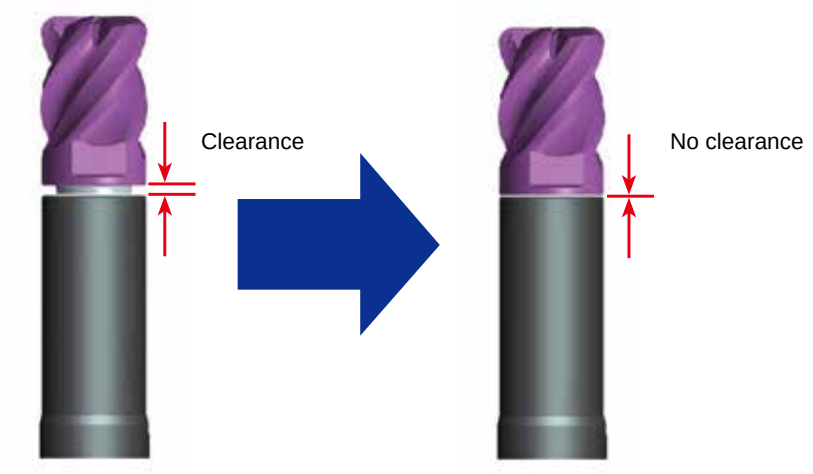
* The series of the head and holder should be the same. (refer to page I366, I396 or I397)
* See page I398 regarding how to install the head

HOW TO INSTALL THE HEAD

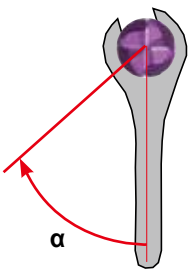
- Before assembly, remove the rust preventative oil and clean the taper and end faces.
  Apply anti seize lubricant to the thread and ensure none comes in contact with the taper faces of the head or holder.



- Lightly screw in the head by hand then tighten using the wrench provided.
- Refer to the table below for the recommended clamping torque.



iMX Series	Reference tightening angle α	Recommended clamping torque (lbf-in)
iMX10	50°	88
iMX12	50°	132
iMX16	50°	265
iMX20	40°	440
iMX25	35°	660

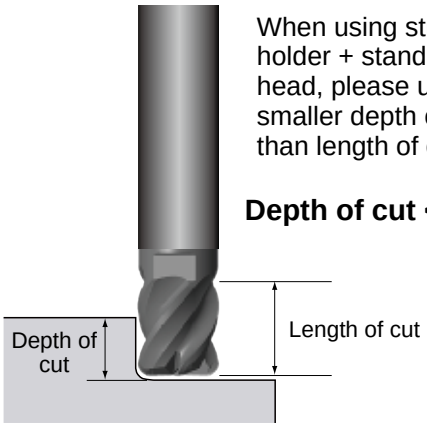


Note 1) Do not handle cutting edges with bare hands.
Note 2) Please use the wrench provided. It is thinner than a standard wrench to prevent damage to the flutes when tightening.

HOW TO SELECT iMX HOLDERS

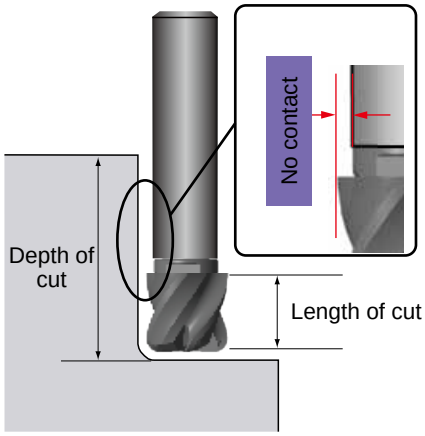
- When using straight holder + standard head, interference will occur in cases where the depth of cut is larger than the length of cut of the head.
- When using straight holder + oversize type head, larger depths of cut are possible because the diameter of the head is larger than the holder.

Straight + Standard head



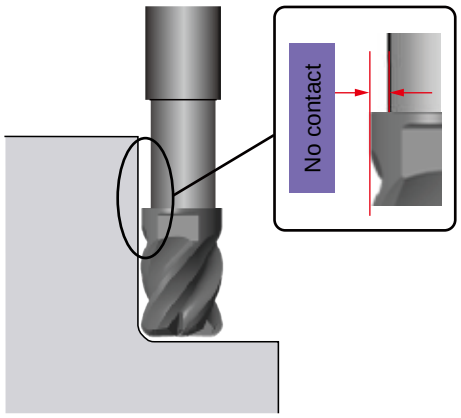
Less than 3D overhang is recommended when depth of cut < length of cut.

Straight + Oversize type

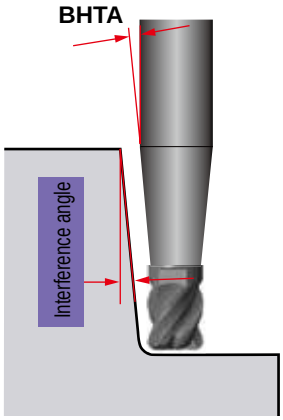


- Undercut type with relieved neck is suitable for vertical wall machining.
- The large diameter of the taper neck holder provides stability in long overhang applications.
- Undercut and taper neck types are now also available. (Please refer to diameter BD of each type for minimum diameter.)

Undercut + Standard head



Taper neck + Standard head



IDENTIFICATION

Reduce the cutting parameters by the coefficient values shown according to the length of overhang.
For long edge and Oversize types heads refer to their specific recommended conditions.

Work material	Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys			Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel			Austenitic stainless steel, Ferritic, Precipitation hardening stainless steel, Titanium alloy		
L/D	Revolution (RPM)	Feed (IPT)	Depth of cut ae (inch)	Revolution (RPM)	Feed (IPT)	Depth of cut ae (inch)	Revolution (RPM)	Feed (IPT)	Depth of cut ae (inch)
2	100%	100%	100%	100%	100%	100%	100%	100%	100%
3	100%	100%	100%	100%	100%	100%	100%	100%	100%
4	80%	90%	70%	80%	90%	70%	80%	90%	70%
5	60%	80%	40%	60%	80%	40%	60%	80%	40%
6	50%	70%	30%	50%	70%	30%	50%	70%	30%
7	40%	70%	20%	40%	70%	20%	30%	60%	20%
8	40%	60%	10%	40%	60%	10%	30%	50%	10%
9	30%	60%	10%	30%	60%	10%	20%	50%	10%

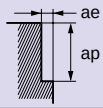
Work material	Precipitation hardening stainless steel, Cobalt chromium alloy			Heat resistant alloys Inconel718		
L/D	Revolution (RPM)	Feed (IPT)	Depth of cut ae (inch)	Revolution (RPM)	Feed (IPT)	Depth of cut ae (inch)
2	100%	100%	100%	100%	100%	100%
3	100%	100%	100%	100%	100%	100%
4	80%	90%	70%	80%	90%	70%
5	60%	80%	40%	60%	80%	40%
6	50%	70%	30%	50%	70%	30%
7	30%	60%	20%	30%	60%	20%
8	30%	50%	10%	30%	50%	10%
9	20%	50%	10%	20%	50%	10%

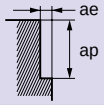
iMX-S3HV

Square head, 3 flute, Irregular helix

RECOMMENDED CUTTING CONDITIONS

Side milling

Work material		Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel				Austenitic stainless steel, Ferritic, Precipitation hardening stainless steel, Titanium alloy			
DC		Revolution	Feed rate	Depth of cut	Depth of cut	Revolution	Feed rate	Depth of cut	Depth of cut	Revolution	Feed rate	Depth of cut	Depth of cut
(mm)	(inch)	(RPM)	(IPM)	ap (inch)	ae (inch)	(RPM)	(IPM)	ap (inch)	ae (inch)	(RPM)	(IPM)	ap (inch)	ae (inch)
	.3750	5000	52.5	.300	.075	4000	28.8	.300	.075	3400	30.6	.300	.075
10	.3937	4800	50.4	.315	.079	3800	27.4	.315	.079	3200	28.8	.315	.079
12	.4724	4000	42.0	.378	.094	3200	25.0	.378	.094	2700	25.1	.378	.094
	.5000	3700	38.9	.400	.100	3000	23.4	.400	.100	2500	23.3	.400	.100
	.6250	3000	35.1	.500	.125	2400	21.6	.500	.125	2000	21.0	.500	.125
16	.6299	3000	35.1	.504	.126	2400	21.6	.504	.126	2000	21.0	.504	.126
	.7500	2500	29.3	.600	.150	2000	18.0	.600	.150	1700	17.9	.600	.150
20	.7874	2400	28.1	.630	.157	1900	17.1	.630	.157	1600	16.8	.630	.157
25	.9843	1900	26.8	.787	.197	1500	13.5	.787	.197	1300	13.7	.787	.197
	1.0000	1900	26.8	.800	.200	1500	13.5	.800	.200	1300	13.7	.800	.200
Depth of cut													

Work material		Precipitation hardening stainless steel, Cobalt chromium alloy				Heat resistant alloys Inconel718			
DC		Revolution	Feed rate	Depth of cut	Depth of cut	Revolution	Feed rate	Depth of cut	Depth of cut
(mm)	(inch)	(RPM)	(IPM)	ap (inch)	ae (inch)	(RPM)	(IPM)	ap (inch)	ae (inch)
	.3750	2500	18.0	.300	.075	1300	6.2	.300	.038
10	.3937	2400	17.3	.315	.079	1300	6.2	.315	.039
12	.4724	2000	15.6	.378	.094	1100	5.9	.378	.047
	.5000	1900	14.8	.400	.100	990	5.3	.400	.050
	.6250	1500	13.5	.500	.125	790	4.7	.500	.063
16	.6299	1500	13.5	.504	.126	790	4.7	.504	.063
	.7500	1200	10.8	.600	.150	660	4.0	.600	.075
20	.7874	1200	10.8	.630	.157	630	3.8	.630	.079
25	.9843	950	8.6	.787	.197	500	3.0	.787	.098
	1.0000	940	8.5	.800	.200	500	3.0	.800	.100
Depth of cut									

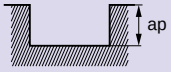
1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2) If the depth of cut is shallow, the revolution and feed rate can be increased.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills.
   However, if the rigidity of the machine or the work piece installation is poor, vibration or abnormal sound can occur.
   In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

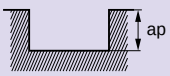
iMX-S3HV

Square head, 3 flute, Irregular helix

RECOMMENDED CUTTING CONDITIONS

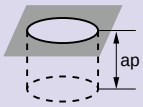
Slotting

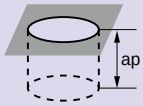
Work material		Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys			Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel			Austenitic stainless steel, Ferritic, Precipitation hardening stainless steel, Titanium alloy		
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)
	.3750	3400	16.1	.188	2600	9.4	.188	2500	9.0	.188
10	.3937	3200	15.4	.197	2500	9.0	.197	2400	8.6	.197
12	.4724	2700	16.2	.236	2100	10.1	.236	2000	9.6	.236
	.5000	2500	15.0	.250	2000	9.6	.250	1900	9.1	.250
	.6250	2000	16.8	.313	1600	9.6	.313	1500	10.8	.313
16	.6299	2000	16.8	.315	1600	9.6	.315	1500	10.8	.315
	.7500	1700	14.3	.375	1300	7.8	.375	1200	8.6	.375
20	.7874	1600	13.4	.394	1300	7.8	.394	1200	8.6	.394
25	.9843	1300	12.1	.472	1000	6.0	.472	950	6.8	.472
	1.0000	1300	12.1	.480	990	5.9	.480	940	6.8	.480
Depth of cut										

Work material		Precipitation hardening stainless steel, Cobalt chromium alloy			Heat resistant alloys Inconel718		
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)
	.3750	2000	6.0	.188	1000	2.4	.075
10	.3937	1900	5.7	.197	970	2.3	.079
12	.4724	1600	6.7	.236	810	2.9	.094
	.5000	1500	6.3	.250	760	2.7	.100
	.6250	1200	7.2	.313	610	3.7	.125
16	.6299	1200	7.2	.315	610	3.7	.126
	.7500	990	5.9	.375	510	3.1	.150
20	.7874	950	5.7	.394	490	2.9	.157
25	.9843	760	4.6	.472	390	2.3	.197
	1.0000	740	4.4	.480	380	2.3	.200
Depth of cut							

1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2) If the depth of cut is shallow, the revolution and feed rate can be increased.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills.
   However, if the rigidity of the machine or the work piece installation is poor, vibration or abnormal sound can occur.
   In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

Plunging

Work material		Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel				Austenitic stainless steel, Ferritic, Precipitation hardening stainless steel, Titanium alloy			
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Peck ap (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Peck ap (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Peck ap (inch)
	.3750	3400	18.7	.188	.100	2300	8.1	.188	.080	2000	2.4	.188	.023
10	.3937	3200	17.6	.197	.100	2200	7.7	.197	.080	1900	2.3	.197	.023
12	.4724	2700	14.9	.236	.100	1900	6.7	.236	.080	1600	1.9	.236	.023
	.5000	2500	13.8	.250	.100	1800	6.3	.250	.080	1500	1.8	.250	.023
	.6250	2000	11.0	.313	.100	1400	4.9	.313	.080	1200	1.4	.313	.023
16	.6299	2000	11.0	.315	.100	1400	4.9	.315	.080	1200	1.4	.315	.023
	.7500	1700	9.4	.375	.100	1200	4.2	.375	.080	990	1.2	.375	.023
20	.7874	1600	8.8	.394	.100	1100	3.9	.394	.080	950	1.1	.394	.023
25	.9843	1300	7.2	.492	.100	880	3.1	.492	.080	760	.9	.492	.023
	1.0000	1300	7.2	.500	.100	880	3.1	.500	.080	740	.9	.500	.023
Depth of cut													

Work material		Precipitation hardening stainless steel, Cobalt chromium alloy			
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Peck ap (inch)
	.3750	1300	1.6	.188	.023
10	.3937	1300	1.6	.197	.023
12	.4724	1100	1.3	.236	.023
	.5000	990	1.2	.250	.023
	.6250	790	.9	.313	.023
16	.6299	790	.9	.315	.023
	.7500	660	.8	.375	.023
20	.7874	630	.8	.394	.023
25	.9843	500	.6	.492	.023
	1.0000	500	.6	.500	.023
Depth of cut					

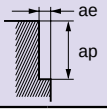
1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills.
However, if the rigidity of the machine or the work piece installation is poor, vibration or abonrmal sound can occur.
In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

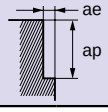
iMX-S4HV/iMX-S4HV-S/iMX-C4HV/iMX-C4HV-S

Square/Corner radius, 4 flute, Irregular helix (With/Without coolant hole)

RECOMMENDED CUTTING CONDITIONS

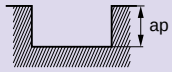
Side milling

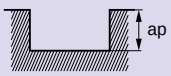
Work material		Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel				Austenitic stainless steel, Ferritic, Precipitation hardening stainless steel, Titanium alloy			
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
	.3750	5000	70.0	.375	.075	4000	38.4	.375	.075	3400	40.8	.375	.075
10	.3937	4800	67.2	.394	.079	3800	36.5	.394	.079	3200	38.4	.394	.079
12	.4724	4000	56.0	.472	.094	3200	33.3	.472	.094	2700	33.5	.472	.094
	.5000	3700	51.8	.500	.100	3000	31.2	.500	.100	2500	31.0	.500	.100
	.6250	3000	46.8	.625	.125	2400	28.8	.625	.125	2000	28.0	.625	.125
16	.6299	3000	46.8	.630	.126	2400	28.8	.630	.126	2000	28.0	.630	.126
	.7500	2500	39.0	.750	.150	2000	24.0	.750	.150	1700	23.8	.750	.150
20	.7874	2400	37.4	.787	.157	1900	22.8	.787	.157	1600	22.4	.787	.157
25	.9843	1900	35.7	.984	.197	1500	18.0	.984	.197	1300	18.2	.984	.197
	1.0000	1900	35.7	1.000	.200	1500	18.0	1.000	.200	1300	18.2	1.000	.200
Depth of cut													

Work material		Precipitation hardening stainless steel, Cobalt chromium alloy				Heat resistant alloys Inconel718			
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
	.3750	2500	24.0	.375	.075	1300	8.3	.375	.038
10	.3937	2400	23.0	.394	.079	1300	8.3	.394	.039
12	.4724	2000	20.8	.472	.094	1100	7.9	.472	.047
	.5000	1900	19.8	.500	.100	990	7.1	.500	.050
	.6250	1500	18.0	.625	.125	790	6.3	.625	.063
16	.6299	1500	18.0	.630	.126	790	6.3	.630	.063
	.7500	1200	14.4	.750	.150	660	5.3	.750	.075
20	.7874	1200	14.4	.787	.157	630	5.0	.787	.079
25	.9843	950	11.4	.984	.197	500	4.1	.984	.098
	1.0000	940	11.3	1.000	.200	500	4.0	1.000	.100
Depth of cut									

1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2) If the depth of cut is shallow, the revolution and feed rate can be increased.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills.
However, if the rigidity of the machine or the work piece installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

Slotting

Work material		Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys			Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel			Austenitic stainless steel, Ferritic, Precipitation hardening stainless steel, Titanium alloy		
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)
	.3750	3400	21.4	.188	2600	12.5	.188	2500	12.0	.188
10	.3937	3200	20.5	.197	2500	12.0	.197	2400	11.5	.197
12	.4724	2700	21.6	.236	2100	13.4	.236	2000	12.8	.236
	.5000	2500	20.0	.250	2000	12.8	.250	1900	12.2	.250
	.6250	2000	22.4	.313	1600	12.8	.313	1500	14.4	.313
16	.6299	2000	22.4	.315	1600	12.8	.315	1500	14.4	.315
	.7500	1700	19.0	.375	1300	10.4	.375	1200	11.5	.375
20	.7874	1600	17.9	.394	1300	10.4	.394	1200	11.5	.394
25	.9843	1300	16.1	.472	1000	8.0	.472	950	9.1	.472
	1.0000	1300	16.1	.480	990	7.9	.480	940	9.0	.480
Depth of cut										

Work material		Precipitation hardening stainless steel, Cobalt chromium alloy			Heat resistant alloys Inconel718		
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)
	.3750	2000	8.0	.188	1000	3.2	.075
10	.3937	1900	7.6	.197	970	3.1	.079
12	.4724	1600	9.0	.236	810	3.9	.094
	.5000	1500	8.4	.250	760	3.6	.100
	.6250	1200	9.6	.313	610	4.9	.125
16	.6299	1200	9.6	.315	610	4.9	.126
	.7500	1000	7.9	.375	510	4.1	.150
20	.7874	950	7.6	.394	490	3.9	.157
25	.9843	760	6.1	.472	390	3.1	.197
	1.0000	740	5.9	.480	380	3.0	.200
Depth of cut							

1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2) If the depth of cut is shallow, the revolution and feed rate can be increased.
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   However, if the rigidity of the machine or the work piece installation is poor, vibration or abnormal sound can occur.
   In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

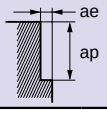
iMX-S4HV	➤ I370, I371
iMX-S4HV-S	➤ I372, I373
iMX-C4HV	➤ I376–I378
iMX-C4HV-S	➤ I380, I381

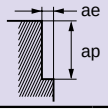
iMX-S4HV/iMX-C4HV

Square/Corner radius head, 4 flute, Irregular helix, Long cutting edge type

RECOMMENDED CUTTING CONDITIONS

Side milling

Work material		Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel				Austenitic stainless steel, Ferritic, Precipitation hardening stainless steel, Titanium alloy			
L/D	DC (mm)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
4	16	2000	28.0	1.260	.031	1600	17.9	1.260	.031	1200	14.9	1.260	.031
	20	1600	22.4	1.575	.039	1300	14.6	1.575	.039	950	11.8	1.575	.039
6	16	1200	13.4	1.260	.031	990	8.0	1.260	.031	790	7.6	1.260	.031
	20	950	10.6	1.575	.039	800	6.4	1.575	.039	630	6.0	1.575	.039
Depth of cut													

Work material		Precipitation hardening stainless steel, Cobalt chromium alloy				Heat resistant alloys Inconel718			
L/D	DC (mm)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
4	16	1000	11.2	1.260	.031	610	4.9	1.260	.016
	20	800	9.0	1.575	.039	490	3.9	1.575	.020
6	16	610	4.9	1.260	.031	390	2.5	1.260	.016
	20	490	3.9	1.575	.039	320	2.0	1.575	.020
Depth of cut									

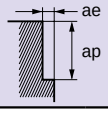
1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2) If the depth of cut is shallow, the revolution and feed rate can be increased.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the work piece installation is poor, vibration or abnormal sound can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.
4) L/D will be +1 when using a long cutting edge type head.

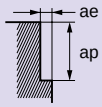
iMX-S4HV ➤ I370, I371
iMX-C4HV ➤ I376—I378

iMX-S4HV/iMX-C4HV

Square/Corner radius head, 4 flute, Irregular helix, Oversize type head

Side milling

Work material		Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel				Austenitic stainless steel, Ferritic, Precipitation hardening stainless steel, Titanium alloy			
L/D	DC (mm)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
≤3	12	4000	56.0	.472	.047	3200	30.7	.472	.047	2700	32.4	.472	.047
	14	3400	47.6	.551	.055	2700	28.1	.551	.055	2300	28.5	.551	.055
	18	2600	40.6	.709	.071	2100	25.2	.709	.071	1800	25.2	.709	.071
	22	2200	34.3	.866	.087	1700	20.4	.866	.087	1500	21.0	.866	.087
	28	1700	32.0	1.102	.110	1400	16.8	1.102	.110	1100	15.4	1.102	.110
	30	1600	30.1	1.181	.118	1300	15.6	1.181	.118	1100	15.4	1.181	.118
	32	1500	28.2	1.260	.126	1200	14.4	1.260	.126	1000	14.0	1.260	.126
5	12	2400	26.9	.472	.020	1900	15.2	.472	.020	1600	15.4	.472	.020
	14	2000	22.4	.551	.024	1600	12.8	.551	.024	1400	13.4	.551	.024
	18	1600	19.8	.709	.028	1200	11.5	.709	.028	1100	12.3	.709	.028
	22	1300	16.1	.866	.035	1000	9.6	.866	.035	860	9.6	.866	.035
	28	1000	15.6	1.102	.043	800	7.7	1.102	.043	680	7.6	1.102	.043
	30	950	14.8	1.181	.047	740	7.1	1.181	.047	630	7.1	1.181	.047
	32	890	13.9	1.260	.051	700	6.7	1.260	.051	590	6.6	1.260	.051
7	12	1600	15.4	.472	.008	1300	8.3	.472	.008	850	6.8	.472	.008
	14	1400	13.4	.551	.012	1100	8.8	.551	.012	730	7.0	.551	.012
	18	1100	12.3	.709	.016	890	7.1	.709	.016	570	5.5	.709	.016
	22	860	9.6	.866	.016	730	5.8	.866	.016	460	4.4	.866	.016
	28	680	8.4	1.102	.024	570	4.6	1.102	.024	360	3.5	1.102	.024
	30	630	7.8	1.181	.024	530	4.2	1.181	.024	340	3.3	1.181	.024
	32	590	7.3	1.260	.024	500	4.0	1.260	.024	320	3.1	1.260	.024
Depth of cut													

Work material		Precipitation hardening stainless steel, Cobalt chromium alloy				Heat resistant alloys Inconel718			
L/D	DC (mm)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
≤3	12	2000	19.2	.472	.047	810	5.2	.472	.035
	14	1700	17.7	.551	.055	690	5.0	.551	.043
	18	1300	15.6	.709	.071	700	5.6	.709	.055
	22	1100	13.2	.866	.087	570	4.6	.866	.067
	28	900	10.2	1.102	.110	450	3.6	1.102	.083
	30	790	9.5	1.181	.118	420	3.4	1.181	.091
	32	740	8.9	1.260	.126	390	3.1	1.260	.094
5	12	1300	10.4	.472	.020	280	1.3	.472	.016
	14	1100	8.8	.551	.024	240	1.5	.551	.016
	18	890	8.5	.709	.028	320	2.0	.709	.024
	22	730	7.0	.866	.035	260	1.7	.866	.028
	28	570	5.5	1.102	.043	210	1.3	1.102	.031
	30	530	5.1	1.181	.047	190	1.2	1.181	.035
	32	500	4.8	1.260	.051	180	1.2	1.260	.039
7	12	650	4.2	.472	.008	–	–	–	–
	14	550	4.4	.551	.012	–	–	–	–
	18	430	3.4	.709	.016	–	–	–	–
	22	350	2.8	.866	.016	–	–	–	–
	28	280	2.2	1.102	.024	–	–	–	–
	30	260	2.1	1.181	.024	–	–	–	–
	32	240	1.9	1.260	.024	–	–	–	–
Depth of cut									

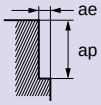
iMX-S4HV ➤ I370, I371
iMX-C4HV ➤ I376–I378

iMX-S3A/iMX-C3A

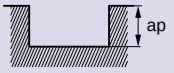
Square/Corner radius head, 3 flute, For aluminum alloy

RECOMMENDED CUTTING CONDITIONS

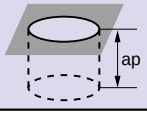
Side milling

Work material	Aluminum alloy			
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
	.3750	17000	234.6	.300	.113
10	.3937	16000	220.8	.315	.118
12	.4724	13000	179.4	.378	.142
	.5000	13000	179.4	.400	.150
	.6250	10000	180.0	.500	.188
16	.6299	9900	178.2	.504	.189
	.7500	8400	173.9	.600	.225
20	.7874	8000	165.6	.630	.236
25	.9843	6400	159.4	.787	.295
	1.0000	6300	156.9	.800	.300
Depth of cut					

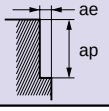
Slotting

Work material	Aluminum alloy			
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)
	.3750	17000	137.7	.188
10	.3937	16000	129.6	.197
12	.4724	13000	109.2	.236
	.5000	13000	109.2	.250
	.6250	10000	111.0	.313
16	.6299	9900	109.9	.315
	.7500	8400	108.4	.375
20	.7874	8000	103.2	.394
25	.9843	6400	96.0	.492
	1.0000	6300	94.5	.500
Depth of cut				

Plunging

Work material	Aluminum alloy			
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Peck ap (inch)
	.3750	10000	39.0	.188	.10
10	.3937	9600	37.4	.197	.10
12	.4724	8000	31.2	.236	.10
	.5000	7500	29.3	.250	.10
	.6250	6000	23.4	.313	.10
16	.6299	6000	23.4	.315	.10
	.7500	5000	19.5	.375	.10
20	.7874	4800	18.7	.394	.10
25	.9843	3800	14.8	.492	.10
	1.0000	3800	14.8	.500	.10
Depth of cut					

Oversize type head Side milling

Work material	Aluminum alloy			
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
12	.472	13000	179.4	.378	.094
14	.551	11000	151.8	.441	.110
18	.709	8800	158.4	.567	.142
22	.866	7200	149.0	.693	.173
28	1.102	5700	141.9	.882	.220
Depth of cut					

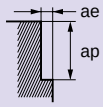
1) The use of water-soluble coolant is recommended.
2) Vibration may occur if the rigidity of machine or work piece is low.
In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

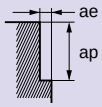
iMX-S3A ➤ I374, I375
iMX-C3A ➤ I386, I387

iMX-C6HV/C10HV/C12HV

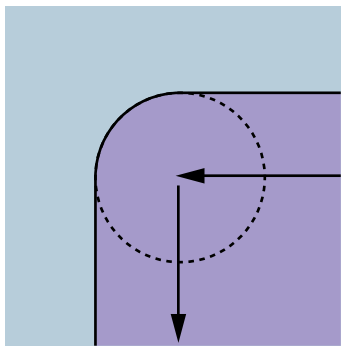
Corner radius head, Multi-flute, Irregular helix

Side milling

Work material		Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel				Austenitic stainless steel, Ferritic, Precipitation hardening stainless steel, Titanium alloy				Precipitation hardening stainless steel, Cobalt chromium alloy			
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
	.3750	6700	112.6	.375	.038	5000	84.0	.375	.038	3400	57.1	.375	.038
10	.3937	6400	107.5	.394	.039	4800	80.6	.394	.039	3200	53.8	.394	.039
12	.4724	5300	104.9	.472	.047	4000	79.2	.472	.047	2700	53.5	.472	.047
	.5000	5000	99.0	.500	.050	3700	73.3	.500	.050	2500	49.5	.500	.050
	.6250	4000	140.0	.625	.025	3000	105.0	.625	.025	2000	70.0	.625	.025
16	.6299	4000	140.0	.630	.025	3000	105.0	.630	.025	2000	70.0	.630	.025
	.7500	3300	154.4	.750	.030	2500	117.0	.750	.030	1700	79.6	.750	.030
20	.7874	3200	149.8	.787	.031	2400	112.3	.787	.031	1600	74.9	.787	.031
25	.9843	2500	117.0	.984	.039	1900	88.9	.984	.039	1300	60.8	.984	.039
	1.0000	2500	117.0	1.000	.040	1900	88.9	1.000	.040	1300	60.8	1.000	.040
Depth of cut													

Work material		Heat resistant alloys Inconel718			
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
	.3750	1300	10.1	.375	.019
10	.3937	1300	10.1	.394	.020
12	.4724	1100	9.2	.472	.024
	.5000	990	8.3	.500	.025
	.6250	790	11.9	.625	.025
16	.6299	790	11.9	.630	.025
	.7500	660	12.7	.750	.030
20	.7874	630	12.1	.787	.031
25	.9843	500	9.6	.984	.039
	1.0000	500	9.6	1.000	.040
Depth of cut					

1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2) If the depth of cut is shallow, the revolution and feed rate can be increased.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the work piece installation is poor, vibration or abnormal sound can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.
4) If the machining radius at the corner is the same as the tool radius when using a head with more than 10 flutes, please set the depth of cut and feed rate to half of the above.



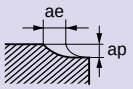
iMX-C6HV ➤ I382
iMX-C10HV ➤ I382
iMX-C12HV ➤ I382

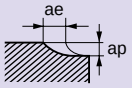
iMX-C4FD-C

Duplex corner radius head, 4 flute, For high feed, with coolant hole

RECOMMENDED CUTTING CONDITIONS

Side milling

Work material		Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel				Hardened steel, Precipitation hardening stainless steel, Ferritic, Precipitation hardening stainless steel,			
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
10	.3937	4800	301.4	.02	.236	4300	270.0	.02	.236	3800	179.4	.020	.236
12	.4724	4000	283.2	.024	.283	3600	254.9	.24	.283	3200	151.0	.024	.283
16	.6299	3000	236.4	.031	.378	2700	212.8	.31	.378	2400	150.7	.031	.378
20	.7874	2400	189.1	.039	.472	2100	173.4	.39	.472	1900	119.3	.039	.472
25	.9843	1900	149.7	.049	.591	1700	134.0	.49	.591	1500	94.2	.049	.591
Depth of cut													

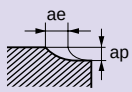
Work material		Austenitic stainless steel, Titanium alloy, Cobalt chromium alloy				Heat resistant alloys Inconel718			
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
10	.3937	1300	41.1	.02	.236	780	12.2	.02	.236
12	.4724	1100	34.8	.024	.283	650	10.1	.24	.283
16	.6299	790	37.3	.031	.378	490	11.6	.31	.378
20	.7874	630	29.7	.039	.472	390	9.2	.39	.472
25	.9843	500	23.6	.049	.591	310	7.3	.49	.591
Depth of cut									

1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2) If the depth of cut is shallow, the revolution and feed rate can be increased.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills.
   However, if the rigidity of the machine or the work piece installation is poor, vibration or abnormal sound can occur.
   In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.
4) Please reduce the feed rate by 50% when ramping.

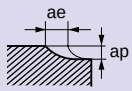
iMX-C4FV

Corner radius head for high efficiency machining, 4 flute, Irregular helix

High depth of cut conditions

Work material		Carbon steel, Alloy steel, Gray Cast Iron				Pre-hardened steel, Alloy tool steel				Hardened steel (45－55HRC)			
DC		Revolution	Feed rate	Depth of cut	Depth of cut	Revolution	Feed rate	Depth of cut	Depth of cut	Revolution	Feed rate	Depth of cut	Depth of cut
(mm)	(inch)	(RPM)	(IPM)	ap (inch)	ae (inch)	(RPM)	(IPM)	ap (inch)	ae (inch)	(RPM)	(IPM)	ap (inch)	ae (inch)
	.3750	3000	117.6	.045	.169	2500	91.0	.038	.169	2000	69.6	.026	.169
10	.3937	2900	113.7	.047	.177	2400	87.4	.039	.177	1900	66.1	.028	.177
12	.4724	2400	94.1	.071	.236	2000	72.8	.055	.236	1600	55.7	.035	.236
	.5000	2300	90.2	.075	.250	1900	69.2	.058	.250	1500	52.2	.038	.250
	.6250	1800	70.6	.070	.293	1500	54.6	.055	.293	1200	41.8	.035	.293
16	.6299	1800	70.6	.071	.295	1500	54.6	.055	.295	1200	41.8	.035	.295
	.7500	1500	58.8	.068	.338	1300	43.7	.053	.338	990	34.5	.034	.338
20	.7874	1400	54.9	.071	.354	1200	43.7	.055	.354	950	33.1	.035	.354
25	.9843	1100	43.1	.094	.453	950	34.6	.071	.453	760	26.4	.047	.453
	1.0000	1100	43.1	.096	.460	940	34.2	.072	.460	740	25.8	.048	.460
Depth of cut													

High speed milling

Work material		Carbon steel, Alloy steel, Gray Cast Iron				Pre-hardened steel, Alloy tool steel				Hardened steel (45－55HRC)			
DC		Revolution	Feed rate	Depth of cut	Depth of cut	Revolution	Feed rate	Depth of cut	Depth of cut	Revolution	Feed rate	Depth of cut	Depth of cut
(mm)	(inch)	(RPM)	(IPM)	ap (inch)	ae (inch)	(RPM)	(IPM)	ap (inch)	ae (inch)	(RPM)	(IPM)	ap (inch)	ae (inch)
	.3750	5000	314.0	.023	.169	4200	231.8	.017	.169	3400	160.5	.014	.169
10	.3937	4800	301.4	.024	.177	4000	220.8	.018	.177	3200	151.0	.014	.177
12	.4724	4000	283.2	.035	.236	3300	207.2	.028	.236	2700	127.4	.018	.236
	.5000	3700	262.0	.038	.250	3100	194.7	.029	.250	2500	118.0	.019	.250
	.6250	3000	236.4	.035	.293	2500	177.0	.027	.293	2000	94.4	.018	.293
16	.6299	3000	236.4	.035	.295	2500	177.0	.028	.295	2000	94.4	.018	.295
	.7500	2500	197.0	.034	.338	2100	148.7	.026	.338	1700	93.8	.017	.338
20	.7874	2400	189.1	.035	.354	2000	141.6	.028	.354	1600	88.3	.018	.354
25	.9843	1900	149.7	.047	.453	1600	113.3	.035	.453	1300	71.8	.024	.453
	1.0000	1900	149.7	.048	.460	1600	113.3	.036	.460	1300	71.8	.024	.460
Depth of cut													

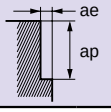
1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) Air blow or oil mist is recommended for good chip evacuation.
3) For profile machining such as molds, machining conditions may differ considerably depending on the work piece geometry, machining methods and depth of cut.
   Reduce the feed rate especially when machining the corner sections of a work piece.
4) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills.
   However, if the rigidity of the machine or the work piece installation is poor, vibration or abnormal sound can occur.
   In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

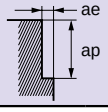
iMX-R4F

Roughing head, 4 flute

RECOMMENDED CUTTING CONDITIONS

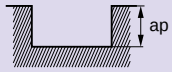
Side milling

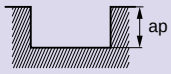
Work material		Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel				Austenitic stainless steel, Ferritic, Precipitation hardening stainless steel, Titanium alloy			
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
	.3750	5000	36.0	.300	.015	4000	19.2	.300	.150	3400	20.4	.300	.150
10	.3937	4800	34.6	.320	.160	3800	18.2	.320	.160	3200	19.2	.320	.160
12	.4724	4000	28.8	.380	.190	3200	16.6	.380	.190	2700	17.3	.380	.190
	.5000	3700	26.6	.400	.200	3000	15.6	.400	.200	2500	16.0	.400	.200
	.6250	3000	24.0	.500	.250	2400	14.4	.500	.250	2000	14.4	.500	.250
16	.6299	3000	24.0	.500	.250	2400	14.4	.500	.250	2000	14.4	.500	.250
	.7500	2500	20.0	.600	.300	2000	12.0	.600	.300	1700	12.2	.600	.300
20	.7874	2400	19.2	.630	.320	1900	11.4	.630	.320	1600	11.5	.630	.320
25	.9843	1900	18.2	.790	.390	1500	9.0	.790	.390	1300	9.4	.790	.390
	1.0000	1900	18.2	.800	.400	1500	9.0	.800	.400	1300	9.4	.800	.400
Depth of cut													

Work material		Precipitation hardening stainless steel, Cobalt chromium alloy				Heat resistant alloys Inconel718			
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
	.3750	2500	12.0	.300	.150	1300	8.3	.300	.038
10	.3937	2400	11.5	.320	.160	1300	8.3	.320	.039
12	.4724	2000	10.4	.380	.190	1100	7.9	.380	.047
	.5000	1900	9.9	.400	.200	990	7.1	.400	.050
	.6250	1500	9.0	.500	.250	790	6.3	.500	.063
16	.6299	1500	9.0	.500	.250	790	6.3	.500	.063
	.7500	1200	7.2	.600	.300	660	5.3	.600	.075
20	.7874	1200	7.2	.630	.320	630	5.0	.630	.079
25	.9843	950	5.7	.790	.390	500	4.0	.790	.098
	1.0000	940	5.6	.800	.400	500	4.0	.800	.100
Depth of cut									

1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2) If the depth of cut is shallow, the revolution and feed rate can be increased.
3) Vibration may occur if the rigidity of machine or work piece is low.
   In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

Slotting

Work material		Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys			Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel			Austenitic stainless steel, Ferritic, Precipitation hardening stainless steel, Titanium alloy		
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)
	.3750	3400	21.4	.190	2600	12.5	.190	2000	6.4	.150
10	.3937	3200	20.5	.200	2500	12.0	.200	1900	6.1	.160
12	.4724	2700	19.4	.240	2100	10.9	.240	1600	6.4	.190
	.5000	2500	18.0	.250	2000	10.4	.250	1500	6.0	.200
	.6250	2000	16.0	.310	1600	9.6	.310	1200	5.8	.250
16	.6299	2000	16.0	.320	1600	9.6	.320	1200	5.8	.250
	.7500	1700	13.6	.380	1300	7.8	.380	990	5.1	.300
20	.7874	1600	12.8	.390	1300	7.8	.390	950	4.9	.320
25	.9843	1300	12.5	.470	1000	6.0	.470	760	4.0	.390
	1.0000	1300	12.5	.480	990	5.9	.480	740	3.8	.400
Depth of cut										

Work material		Precipitation hardening stainless steel, Cobalt chromium alloy		
DC (mm)	DC (inch)	Revolution (RPM)	Feed rate (IPM)	Depth of cut ap (inch)
	.3750	1300	3.1	.150
10	.3937	1300	3.1	.160
12	.4724	1100	3.5	.190
	.5000	990	3.2	.200
	.6250	790	2.8	.250
16	.6299	790	2.8	.250
	.7500	660	2.9	.300
20	.7874	630	2.8	.320
25	.9843	500	2.2	.390
	1.0000	500	2.2	.400
Depth of cut				

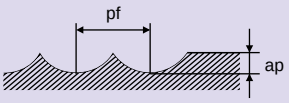
1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2) If the depth of cut is shallow, the revolution and feed rate can be increased.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills.
   However, if the rigidity of the machine or the work piece installation is poor, vibration or abnormal sound can occur.
   In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

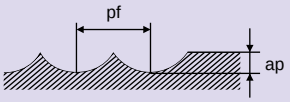
iMX-B4HV/iMX-B4HV-E

Ball nose head, 4 flute, Irregular curve (With/Without coolant hole)

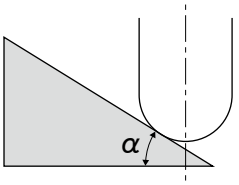
RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material		Carbon steel, Alloy steel, Mild Steel, Pre-hardened steel, Copper, Copper alloys						Austenitic stainless steel, Ferritic, Precipitation hardening stainless steel, Cobalt chromium alloy, Titanium alloy					
Inclination angle		α≤15°		α>15°		Depth of cut ap (inch)	Pick feed (inch)	α≤15°		α>15°		Depth of cut ap (inch)	Pick feed (inch)
PRFRAD (mm)	(inch)	Revolution (RPM)	Feed rate (IPM)	Revolution (RPM)	Feed rate (IPM)			Revolution (RPM)	Feed rate (IPM)	Revolution (RPM)	Feed rate (IPM)		
	.1875	10000	168.0	6700	75.0	.038	.100	7500	123.0	5000	52.0	.038	.100
5	.1969	9600	161.3	6400	71.7	.039	.100	7200	118.1	4800	49.9	.039	.100
6	.2362	8000	156.8	5300	70.0	.047	.120	6000	117.6	4000	49.6	.047	.120
	.2500	7500	147.0	5000	66.0	.050	.120	5700	111.7	3700	45.9	.050	.120
	.3125	6000	127.2	4000	56.0	.063	.160	4500	99.0	3000	42.0	.063	.160
8	.3150	6000	127.2	4000	56.0	.063	.160	4500	99.0	3000	42.0	.063	.160
	.3750	5000	122.0	3300	51.5	.075	.190	3800	95.8	2500	41.0	.075	.190
10	.3937	4800	117.1	3200	49.9	.079	.200	3600	90.7	2400	39.4	.079	.200
12.5	.4921	3800	95.8	2500	39.0	.098	.240	2900	73.1	1900	31.2	.098	.240
	.5000	3800	95.8	2500	39.0	.100	.240	2800	70.6	1900	31.2	.100	.240
Depth of cut													

Work material		Heat resistant alloys Inconel718					
Inclination angle		α≤15°		α>15°		Depth of cut ap (inch)	Pick feed (inch)
PRFRAD (mm)	(inch)	Revolution (RPM)	Feed rate (IPM)	Revolution (RPM)	Feed rate (IPM)		
	.1875	2000	17.6	1300	7.3	.019	.038
5	.1969	1900	16.7	1300	7.3	.020	.039
6	.2362	1600	14.1	1100	6.2	.024	.047
	.2500	1500	13.2	990	5.5	.025	.050
	.3125	1200	11.5	790	5.1	.031	.063
8	.3150	1200	11.5	790	5.1	.031	.063
	.3750	990	9.5	660	4.2	.038	.075
10	.3937	950	9.1	630	4.0	.039	.079
12.5	.4921	760	7.3	500	3.2	.047	.100
	.5000	740	7.1	500	3.2	.048	.100
Depth of cut							

1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2) If the depth of cut is shallow, the revolution and feed rate can be increased.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the work piece installation is poor, vibration or abnormal sound can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.
4) α is the inclination angle of the machined surface.

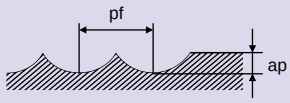


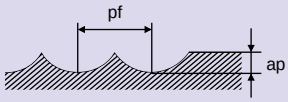
iMX-B4HV ➤ I390, I391
iMX-B4HV-E ➤ I392, I393

iMX-B6HV

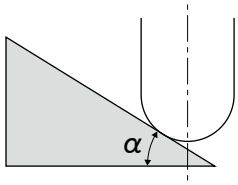
Ball nose head, 6 flute, Irregular curve

Shoulder milling

Work material		Carbon steel, Alloy steel, Mild Steel, Pre-hardened steel						Austenitic stainless steel, Ferritic, Precipitation hardening stainless steel, Cobalt chromium alloy, Titanium alloy					
Inclination angle		α≤15°		α>15°		Depth of cut ap (inch)	Pick feed (inch)	α≤15°		α>15°		Depth of cut ap (inch)	Pick feed (inch)
PRFRAD		Revolution (RPM)	Feed rate (IPM)	Revolution (RPM)	Feed rate (IPM)			Revolution (RPM)	Feed rate (IPM)	Revolution (RPM)	Feed rate (IPM)		
(mm)	(inch)												
	.1875	10000	252.0	6700	112.6	.019	.075	7500	184.5	5000	78.0	.019	.075
5	.1969	9600	241.9	6400	107.5	.020	.079	7200	177.1	4800	74.9	.020	.079
6	.2362	8000	235.2	5300	104.9	.024	.094	6000	176.4	4000	74.4	.024	.094
	.2500	7500	220.5	5000	99.0	.025	.100	5700	167.6	3700	68.8	.025	.100
	.3125	6000	190.8	4000	84.0	.031	.125	4500	148.5	3000	63.0	.031	.125
8	.3150	6000	190.8	4000	84.0	.031	.126	4500	148.5	3000	63.0	.031	.126
	.3750	5000	183.0	3300	77.2	.038	.150	3800	143.6	2500	61.5	.038	.150
10	.3937	4800	175.7	3200	74.9	.039	.157	3600	136.1	2400	59.0	.039	.157
12.5	.4921	3800	143.6	2500	58.5	.047	.197	2900	109.6	1900	46.7	.047	.197
	.5000	3800	143.6	2500	58.5	.048	.200	2800	105.8	1900	46.7	.048	.200
Depth of cut													

Work material		Heat resistant alloys Inconel718					
Inclination angle		α≤15°		α>15°		Depth of cut ap (inch)	Pick feed (inch)
PRFRAD		Revolution (RPM)	Feed rate (IPM)	Revolution (RPM)	Feed rate (IPM)		
(mm)	(inch)						
	.1875	2000	26.4	1300	10.9	.019	.038
5	.1969	1900	25.1	1300	10.9	.020	.039
6	.2362	1600	21.1	1100	9.2	.024	.047
	.2500	1500	19.8	990	8.3	.025	.050
	.3125	1200	17.3	790	7.6	.031	.063
8	.3150	1200	17.3	790	7.6	.031	.063
	.3750	990	14.3	660	6.3	.038	.075
10	.3937	950	13.7	630	6.0	.039	.079
12.5	.4921	760	10.9	500	4.8	.047	.098
	.5000	740	10.7	500	4.8	.048	.100
Depth of cut							

1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2) If the depth of cut is shallow, the revolution and feed rate can be increased.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the work piece installation is poor, vibration or abnormal sound can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.
4) α is the inclination angle of the machined surface.



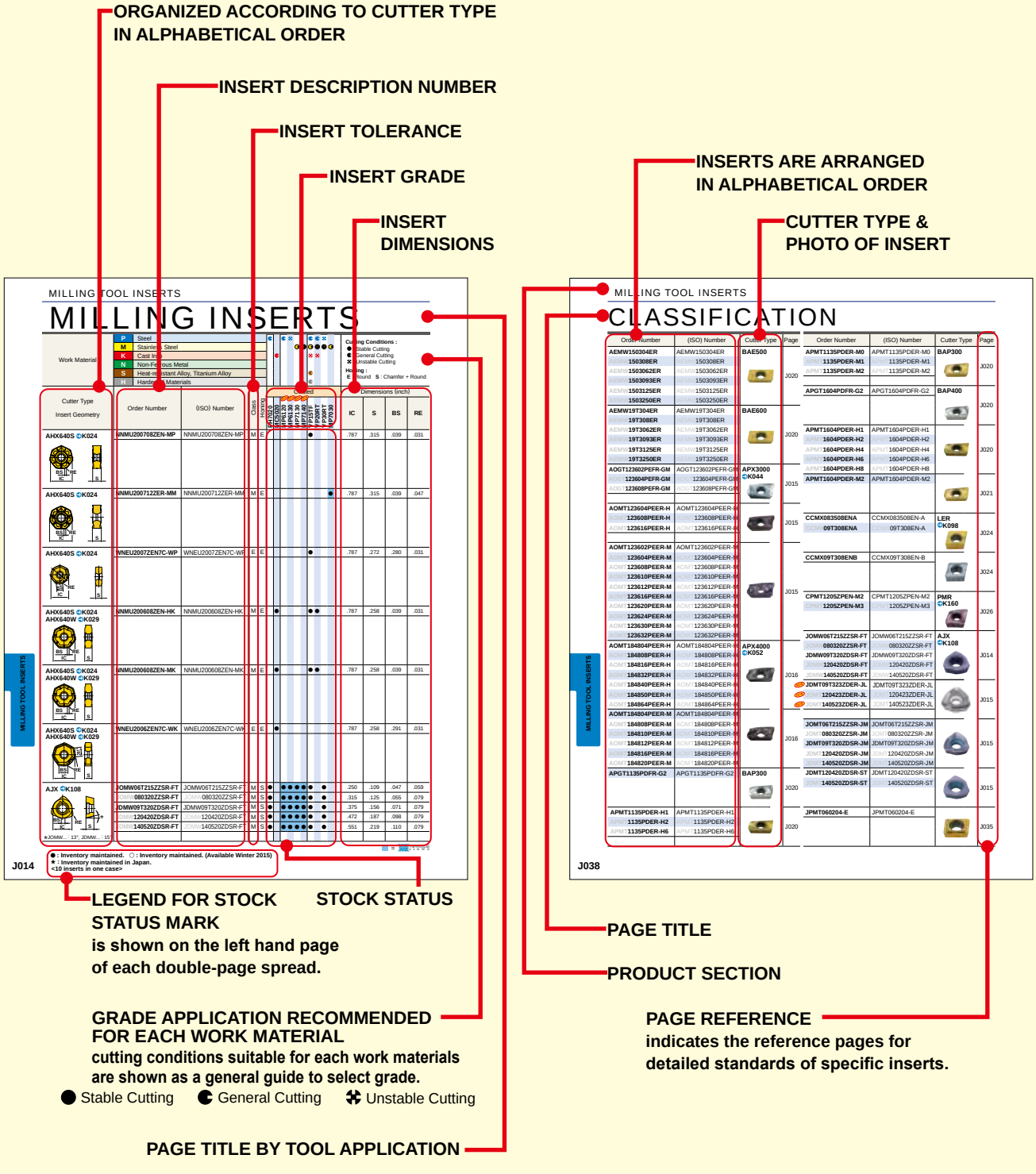
GUIDE TO MILLING TOOL INSERTS

●Organization for Milling insert Standards section

①Organized according to cutter type then, its' respective insert description number.
②Cutters are arranged in alphabetical order.

●Organization for Classification section

①Classified into milling inserts and wiper inserts.
②Inserts are arranged in alphabetical order.



●To Order: Please specify insert number and grade.

MILLING TOOL INSERTS

- GRADE
- SINTERED CBN / PCD

IDENTIFICATION J002
GRADES FOR MILLING J004
MILLING APPLICATION RANGE J005
COATED CARBIDE(CVD and PVD) J008
CERMET J010
CEMENTED CARBIDE J011
CBN(SINTERED CBN) J012
PCD(SINTERED DIAMOND) J013

STANDARD MILLING INSERTS
ROTATING INSERTS J014
CBN AND PCD J036

CLASSIFICATION J038

IDENTIFICATION

ISO CODES FOR MILLING

Symbol	Insert Shape
S	Square
T	Triangular
C	Rhombic 80°
N	Regular Heptagon
O	Octagonal
M	Rhombic 86°
A	Parallelogram 85°
R	Round
X	Special Design
W	Wiper

① Insert Shape

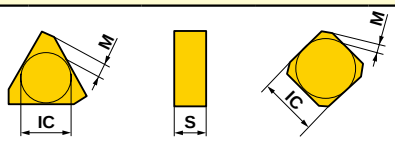
Symbol	Relief Angle **AN**
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Other
X	Other

Major Relief Angle

② Relief Angle

	①	②	③	④
INCH	S	E	E	R
METRIC	S	E	E	R

③ Tolerance Class



Class	IC		M	S
C	.250 .375	±.001	±.0005	±.001
E	.500 .625	±.001	±.001	±.001
K	.250	±.002	±.0005	±.001
	.375	±.002	±.0005	±.001
	.500	±.003	±.0005	±.001
	.625	±.003	±.0005	±.001
N	.250	±.002	±.003	±.001
	.375	±.002	±.003	±.001
	.500	±.003	±.006	±.001
	.625	±.004	±.006	±.001
M	.250	±.002	±.003	±.005
	.375	±.002	±.003	±.005
	.500	±.003	±.005	±.005
	.625	±.004	±.006	±.005

④ Chip Breaker With or Without Hole

Metric

Symbol	Hole	Hole Configuration	Chip-breakers	Figure
W	With Hole	Cylindrical Hole + One Countersink (40°–60°)	No	
T	With Hole		Onesided	
B	With Hole	Cylindrical Hole + One Countersink (70°–90°)	No	
N	Without Hole	–	No	
R	Without Hole	–	Onesided	
X	–	–	–	Special Design

Note: Dimension symbols conforming to ISO13399.
See pages PR3-PR6 for details.

Inch		Diameter of Inscribed Circle (inch)	Metric			
S	T		R	C	S	T
		.250		06	06	11
		.313		08	07	13
3	3	.375		09	09	16
		.394	10			
		.472	12			
4	4	.500		12	12	22
5		.625		16	15	27
		.787	20			

⑤ Insert Size



Inch	Thickness (inch)	Metric
2.5	.156	T3
2	.125	03
3	.187	04

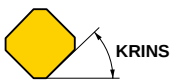
⑥ Insert Thickness

E	Round (EDR)
F	Sharp
T	Chamfer
S	Chamfer+Hone (EDR EDR)
X	Round(small)
Z	Chamfer

⑨ Cutting Edge Condition

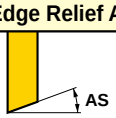
⑤	⑥			⑨				
4	2	A	F	E	R	1	-	JS
12	03	A	F	E	R	1	-	JS
		⑦	⑧		⑩	⑪		⑫

⑦ Cutting Edge Angle



A	45°
E	75°
P	90°

⑧ Wiper Edge Relief Angle

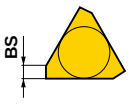


D	15°
E	20°
F	25°

⑩ Cutting Direction

L	Left
N	Neutral
R	Right

⑪ Width of Wiper Edge



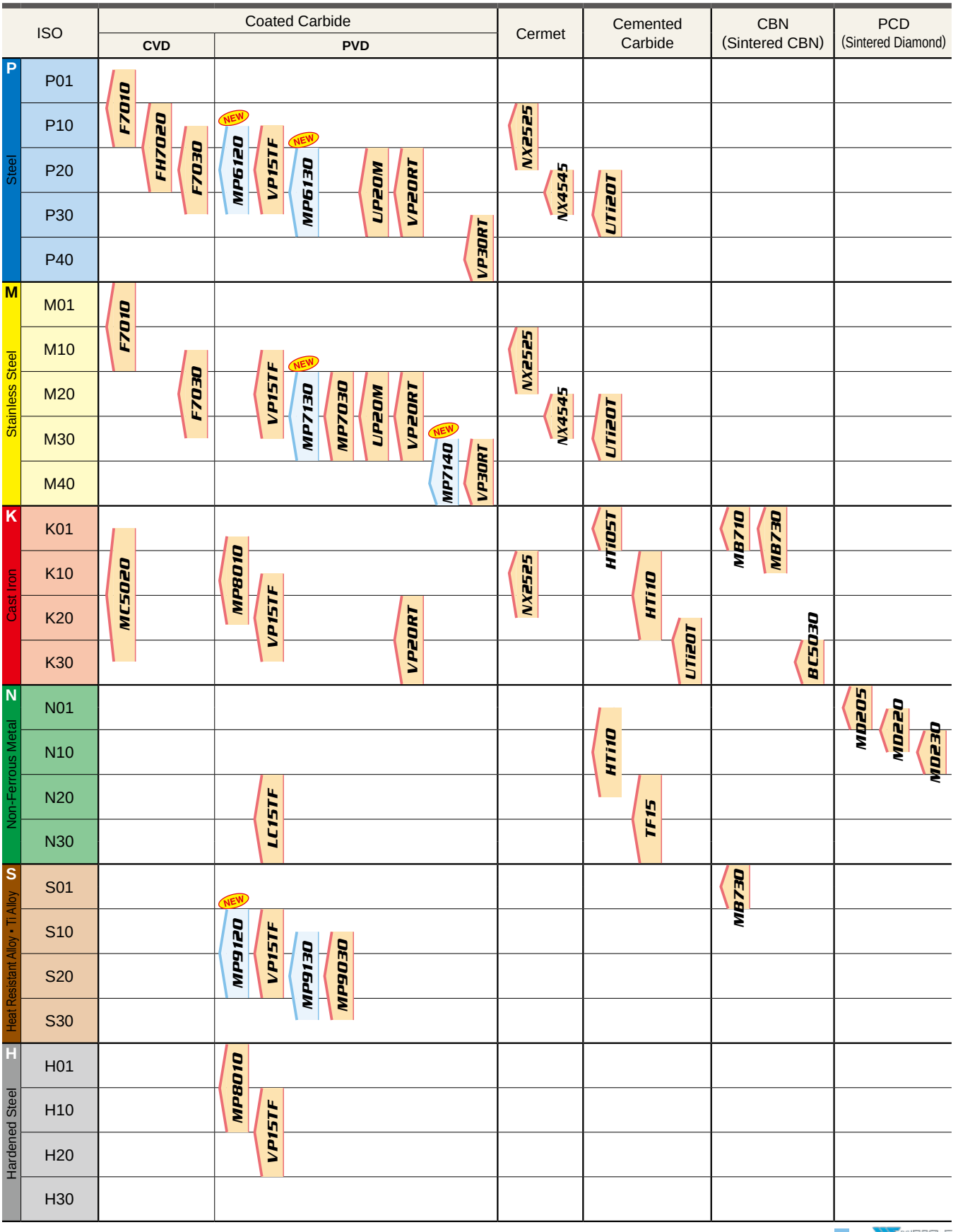
1	.055
2	.094

⑫ Molded Chipbreaker for Milling

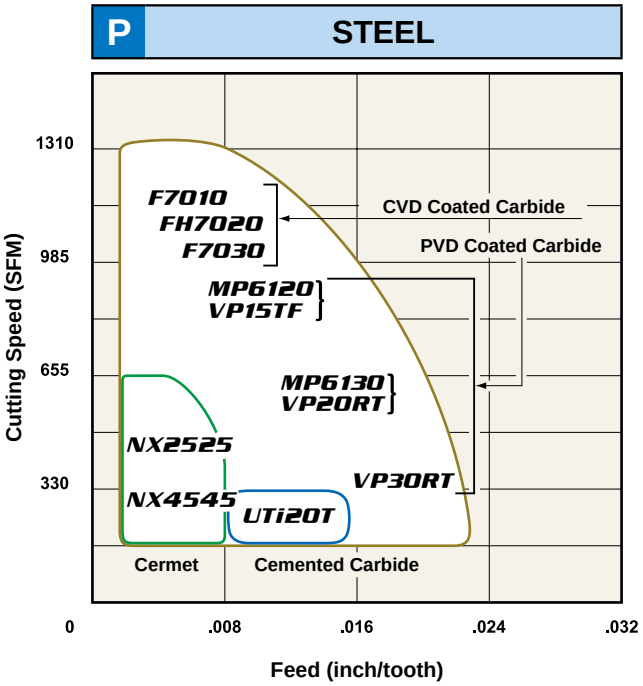


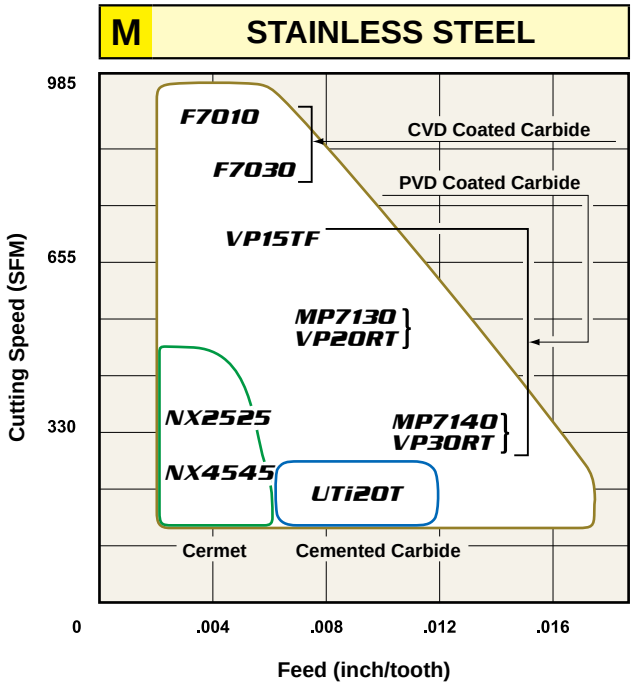
GRADES FOR MILLING

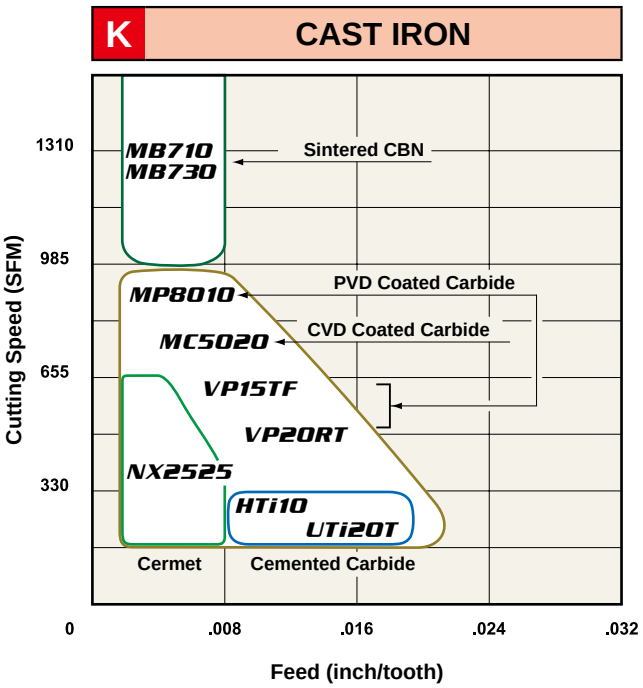
INDEXABLE INSERT GRADES FOR MILLING

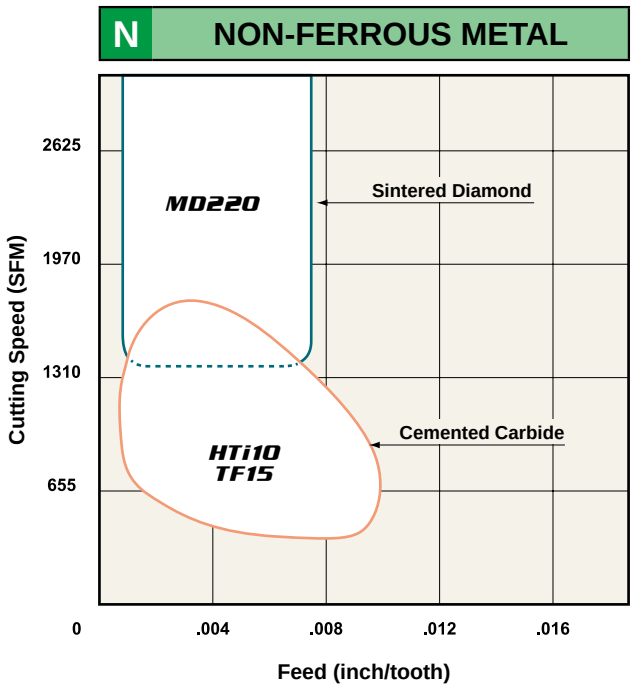


MILLING APPLICATION RANGE





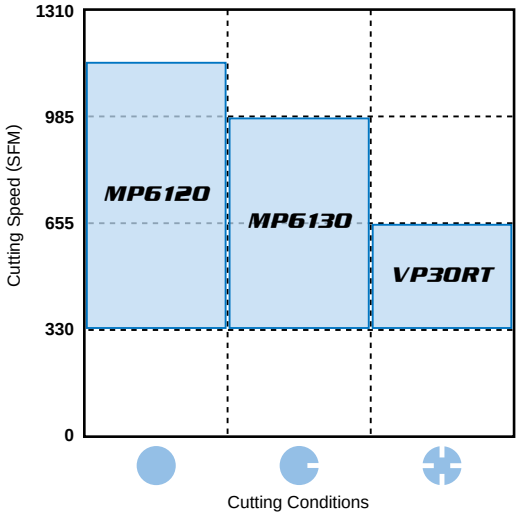




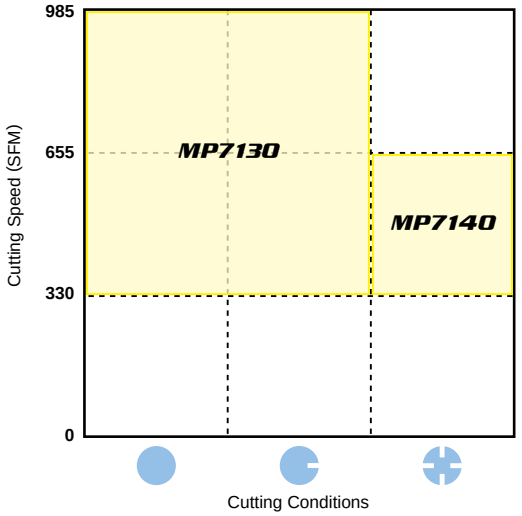
MILLING APPLICATION RANGE

●Recommendation of the insert grade based on cutting speed and conditions for each workpiece.

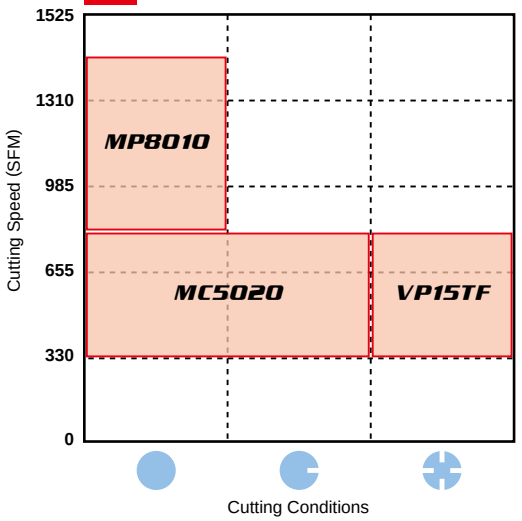
P STEEL (Medium-Rough Cutting)



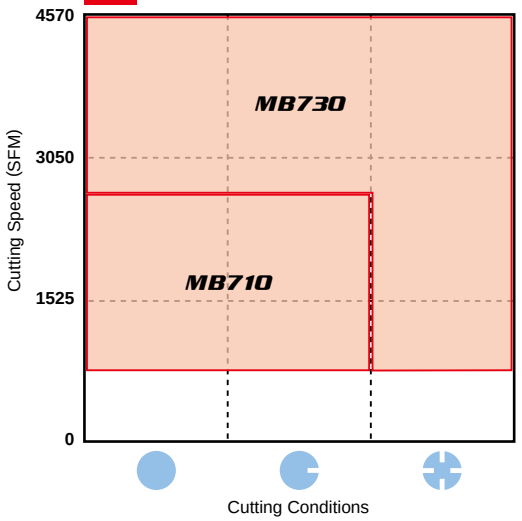
M STAINLESS STEEL



K CAST IRON



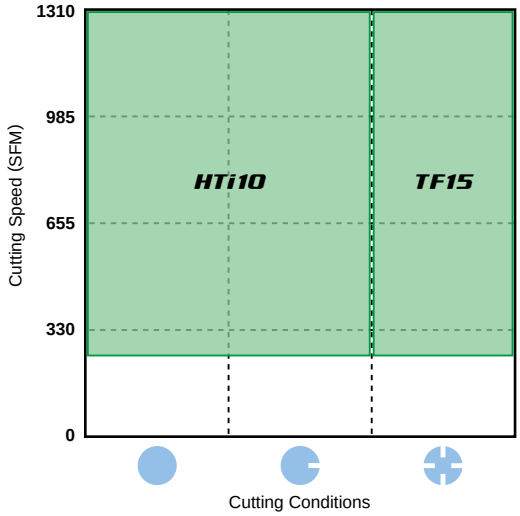
K CAST IRON (CBN)



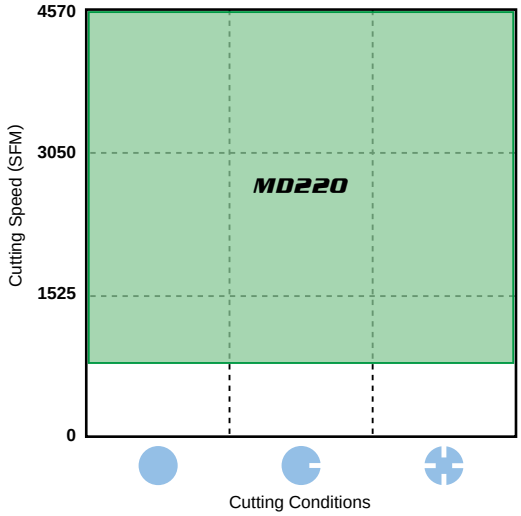
CUTTING CONDITIONS

Stable Cutting	Continuous Cutting Constant Depth of Cut Pre-Machined Securely Clamped Component
General Cutting	
Unstable Cutting	Heavy Interrupted Cutting Irregular Depth of Cut Low Clamping Rigidity

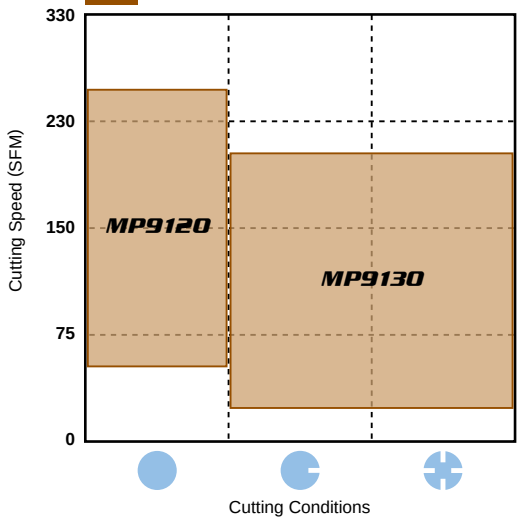
N NON-FERROUS METAL



N NON-FERROUS METAL (PCD)



S HEAT RESISTANT ALLOY, TITANIUM ALLOY



COATED CARBIDE (CVD&PVD)

<CVD>
- **Special tough fibrous structure improves wear and fracture resistance.**
- **It covers a wide application range and thus reduces the number of tools required.**

<PVD>
- **PVD coating prolongs tool life.**
- **Coating of tools with sharp edges is possible without softening or changing the quality of the substrate.**

SELECTION STANDARD

●MILLING

	Work Material	Recommended Grade	Recommended Cutting Speed (SFM)	ISO	Application Range
P	Steel	**F7030**	655 (490 – 820)	P10	FH7020, F7030, NEW MP6120, VP15TF, NEW MP6130, UP20M, VP20RT, VP30RT
		MP6120	575 (400 – 750)	P20	
		MP6130	575 (400 – 750)	P30	
		VP15TF	575 (400 – 750)	P40	
M	Stainless Steel	**F7030**	655 (490 – 820)	M10	F7030, VP15TF, NEW MP7130, MP7030, UP20M, VP20RT, NEW MP7140, VP30RT
		MP7030	490 (330 – 655)	M20	
		MP7130	490 (330 – 655)	M30	
		MP7140	490 (330 – 655)	M40	
		VP15TF	390 (330 – 655)		
K	Cast Iron	**MC5020**	590 (330 – 820)	K01	MC5020, MP8010, VP15TF, VP20RT
		VP15TF	490 (330 – 655)	K10	
				K20	
				K30	
N	Aluminum Alloy	**LC15TF**	3050 (600 – 9100)	N10	LC15TF
				N20	
				N30	
S	Heat Resistant Alloy Ti Alloy	**MP9120**	100 (65 – 130)	S01	NEW MP9120, VP15TF, MP9130, MP9030
		VP15TF	100 (65 – 130)	S10	
		MP9130	131 (82 – 197)	S20	
		MP9030	131 (82 – 197)	S30	
H	Hardened Materials	**MP8010**	240 (150 – 335)	H01	MP8010, VP15TF
		VP15TF	240 (150 – 335)	H10	
				H20	
				H30	

■ = MIRACLE SIGMA

GRADE CHARACTERISTICS

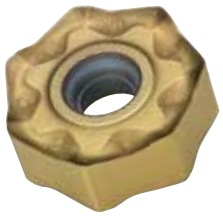
Grade	Substrate		Coating Layer	
	Hardness (HRA)	T.R.S (GPa)*	Composition	Thickness
MC5020	91.0	2.2	TiCN-Al_2O_3-Ti Compound	Thick
FH7020	88.8	2.8	TiCN-Al_2O_3-Ti Compound	Thick
F7030	88.8	2.8	TiCN-Al_2O_3-TiN	Thin
NEW **MP6120**	91.5	2.5	(Al,Ti,Cr)N	Thin
NEW **MP6130**	90.5	2.5	(Al,Ti,Cr)N	Thin
MP7030	90.5	2.5	(Al,Ti)N-Ti Compound	Thin
NEW **MP7130**	90.5	2.5	(Al,Ti,Cr)N	Thin
NEW **MP7140**	88.8	2.8	(Al,Ti,Cr)N	Thin

Grade	Substrate		Coating Layer	
	Hardness (HRA)	T.R.S (GPa)*	Composition	Thickness
MP8010	93.5	2.3	(Al,Ti,Si)N	Thin
NEW **MP9120**	91.5	2.5	(Al,Ti,Cr)N	Thin
MP9030	90.5	2.5	(Al,Ti)N-Ti Compound	Thin
MP9130	90.5	2.7	(Al,Ti,Cr)N	Thin
VP15TF	91.5	2.5	(Al,Ti)N	Thin
VP20RT	90.5	2.5	(Al,Ti)N	Thin
VP30RT	88.8	2.8	(Al,Ti)N	Thin
UP20M	90.5	2.0	TiN	Thin

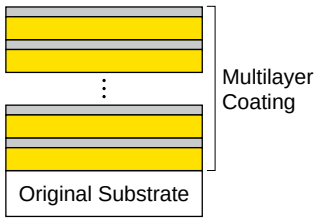
*1GPa=102kg/mm^2

For Machining of Stainless Steel

MP7030



MP7030 is Multilayer coating based on newly developed Ti base compound for superior wear and fracture resistance during stainless steel machining. A special tough cemented carbide substrate gives excellent performance on difficult to cut materials such as stainless steel.



Heat-resistant Alloy, Cutting for Titanium Alloy

MP9130



An new and enhanced super fine cemented carbide substrate has increased toughness while maintaining hardness. The Al-Ti-Cr-N accumulated type coating ensures optimum heat and wear resistance. The combination of these properties gives excellent fracture resistance and a very low coefficient of friction for class leading welding resistance when machining titanium alloy.

CERMET

- **NX2525 for high speed milling.**
- **NX4545 for general milling.**

SELECTION STANDARD

MILLING

Work Material		Recommended Grade	Recommended Cutting Speed (SFM)	ISO	Application Range
P M	Steel	**NX2525**	820 (490 ─ 1150)	P10 M10	NX2525
				P20 M20	NX4545
		NX4545	490 (390 ─ 590)	P30 M30	
K	Cast Iron	**NX2525**	655 (490 ─ 985)	K01	
				K10	NX2525
				K20	

(Note) In case of wet cutting, please use coated carbide F7030 for steel cutting and coated carbide MC5020 for cast iron cutting.

GRADE CHARACTERISTICS

Grade	Hardness (HRA)	T.R.S.(GPa)*	Thermal Conductivity (W/m·K)*	Thermal Expansion (x 10^{-6}/K)
NX2525	92.2	2.0	33	7.8
NX4545	90.0	2.2	33	7.8

*1GPa=102kg/mm^2, 1W/m • K=2.39×10^{-3}cal/cm • sec • ℃

CEMENTED CARBIDE

Available grade series are UTi20T for steel and cast iron, and HTi10 for cast iron, non-ferrous metal and non-metal.

SELECTION STANDARD

MILLING

Work Material		Recommended Grade	Recommended Cutting Speed (SFM)	ISO	Application Range
P	Steel	**UTi20T**	390 (165 ─ 590)	P10	
				P20	UTi20T
				P30	
M	Stainless Steel	**UTi20T**	390 (165 ─ 590)	M10	
				M20	UTi20T
				M30	
K	Cast Iron	**HTi10**	330 (165 ─ 490)	K10	HTi10
				K20	
		UTi20T	390 (165 ─ 590)	K30	UTi20T
N	Non-Ferrous Metal	**HTi10** **TF15**	1310 * (985 ─ 1640)	N01	HTi10
				N10	
				N20	TF15
				N30	

*For High SFM, cutters need to be balanced. Keep the recommended cutting speed shown in each cutter type page.

MAIN COMPONENT AND APPLICATION

ISO	Main Component	Characteristics	Work Material
P M	WC-TiC-TaC-Co	High heat resistance and plastic deformation resistance.	Carbon steel, Alloy steel, Stainless steel, and Cast iron
K N	WC-Co	High rigidity and wear resistance.	Cast iron, Non-Ferrous metals, and Non-metal

GRADE CHARACTERISTICS

ISO	Grade	Hardness (HRA)	Thermal Conductivity (W/m·K)*	Thermal Expansion (x10⁻⁶/K)	Young's Modulus (GPa)*	T.R.S (GPa)*
P M	**UTi20T**	90.5	38	5.5	520	2.0
K N	**HTi05T**	92.5	79	4.5	600	1.5
K N	**HTi10**	92.0	79	4.6	630	2.0
N	**TF15**	91.5	71	5.3	580	2.5

*1GPa = 102kg/mm^2, 1W/m·K=2.39 x 10^{-3}cal/cm · sec ·℃

CBN (SINTERED CBN)



- **MB710 and MB730 for cast iron cutting.**
- **BC5030 for high-speed roughing of cast irons is now available.**
- **BC5030 roughing grade in combination with the AOX body allows use of up to 16 corners and enables cost-effective, high performance machining.**

SELECTION STANDARD / RECOMMENDED CUTTING CONDITIONS

FINISHING

Work Material	Structure	Cutting Speed (SFM) 820 1640 2460 3280 4100	Feed (inch/rev)	Depth of Cut (inch)	Coolant
Gray Cast Iron	Ferritic + Pearilitic Pearilitic	MB710 / MB730	−.012	−.020	Dry

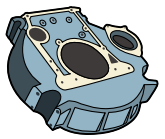
ROUGHING

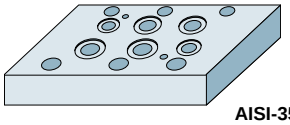
Work Material	Structure	Cutting Speed (SFM) 820 1640 3280 4920 6560	Feed (inch/rev)	Depth of Cut (inch)	Coolant
Gray Cast Iron	Pearilitic	BC5030	−.006	−.118	Dry

FEATURES AND BASE

Grade	Application	Features	Main Component	Coating Layer
MB710	For General Cutting	General purpose grade with well balanced wear and fracture resistance.	CBN TiC Al_2O_3	–
MB730	For High Speed Cutting For Interrupted Cutting	Has the largest CBN content and therefore displays good thermal conductivity. It is suitable for the high temperatures that are generated in high speed cutting.	CBN (High Content) Co Base Alloy	–
BC5030	High-speed machining at large depths of cut High-speed interrupted machining at large depths of cut	High CBN content and high thermal conductivity. The whole insert is composed of sintered CBN. This enables high speed, high efficiency machining at larger depths of cut. The coating is for recognition of spent corners.	CBN AlN	TiN Base

APPLICATION EXAMPLES

Tool		**AOX445R10008D**
Insert		**SL-ONEN120404ASN (BC5030)**
Machine		Machining Center
Workpiece		 **AISI-35**
Cutting Condition	Cutting Speed (SFM)	3940
	Depth of Cut (inch)	.110
	Width of Cut (inch)	2.76
	Table Feed (inch/min)	120
	Feed per Tooth (inch/tooth)	.004
Result		10 times longer tool life and 4 times higher efficiency than ceramics. Excellent machining with a surface finish of Ra < 64μm.

Tool		**NF10000R0408D (MB730)**
Workpiece		 **AISI-35**
Component		Hydraulic component
Cutting Condition	Cutting Speed (SFM)	5480
	Feed per Tooth (inch/tooth)	.0039
	Table Feed (inch/min)	180
	Depth of Cut (inch)	.0020
	Width of Cut (inch)	3.543
Coolant		Dry (Wet cutting at previous process)
Axial Runout (inch)		≤0.005inch
Result		Compared with competitor CBN grade cutting, the normal wear surface is excellent and extendable life finishing is maintained.

PCD (SINTERED DIAMOND)

- **Suitable for non-ferrous metals cutting such as aluminum alloy.**
- **Suitable for extremely high speed finishing.**



Micro-Structure of **MD220**

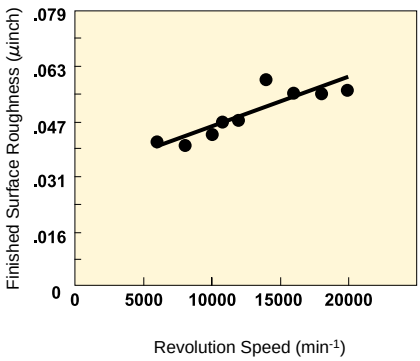
GRADE FEATURES

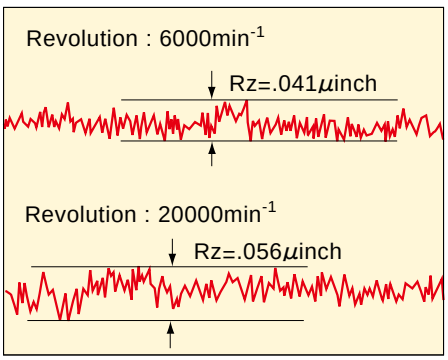
Grade	Features
MD220	Excellent balance between wear resistance and fracutre resistance. A wide range of tooling application.

RECOMMENDED CUTTING CONDITION

Work Material	Cutting Speed (SFM)	Grade	Feed per Tooth (inch/tooth)	Depth of Cut (inch)
Aluminum Alloy (Si ≤ 12%)	3280—19700	**MD220**	—.012	—.002
Aluminum Alloy (Si ≥ 13%)	655—2630			

CUTTING PERFORMANCE





<Cutting Conditions>

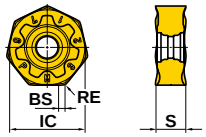
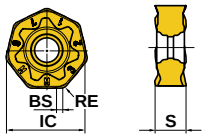
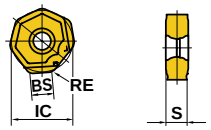
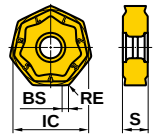
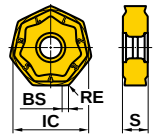
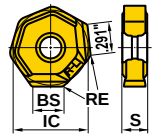
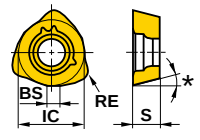
Workpiece	: Aluminum Alloy
Insert	: NP-GDCW1240PDFR2
Grade	: MD220
Tool	: V10000R0406D
Feed	: .008inch/tooth
Depth of Cut	: .020inch
Width of Cut	: 3.150inch
Dry Cutiing	

MILLING INSERTS

Work Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat-resistant Alloy, Titanium Alloy
	H	Hardened Materials

Cutting Conditions :
● : Stable Cutting
◐ : General Cutting
✱ : Unstable Cutting

Honing :
E : Round **S** : Chamfer + Round

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated									Dimensions (inch)			
					FH7020	MC5020	MP6120 (NEW)	MP6130 (NEW)	MP7130 (NEW)	MP7140 (NEW)	VP15TF	VP20RT	VP30RT	MP7030	IC	S	BS	RE
AHX640S ➲K024 	**NNMU200708ZEN-MP**	NNMU200708ZEN-MP	M	E							●				.787	.315	.039	.031
AHX640S ➲K024 	**NNMU200712ZER-MM**	NNMU200712ZER-MM	M	E										●	.787	.315	.039	.047
AHX640S ➲K024 	**WNEU2007ZEN7C-WP**	WNEU2007ZEN7C-WP	E	E							●				.787	.272	.280	.031
AHX640S ➲K024 **AHX640W ➲K029** 	**NNMU200608ZEN-HK**	NNMU200608ZEN-HK	M	E		●					●	●			.787	.258	.039	.031
AHX640S ➲K024 **AHX640W ➲K029** 	**NNMU200608ZEN-MK**	NNMU200608ZEN-MK	M	E		●					●	●			.787	.258	.039	.031
AHX640S ➲K024 **AHX640W ➲K029** 	**WNEU2006ZEN7C-WK**	WNEU2006ZEN7C-WK	E	E		●									.787	.258	.291	.031
AJX ➲K108 	**JOMW06T215ZZSR-FT**	JOMW06T215ZZSR-FT	M	S	●		●	●	●	●	●		●		.250	.109	.047	.059
	JOMW080320ZZSR-FT	JOMW080320ZZSR-FT	M	S	●		●	●	●	●	●		●		.315	.125	.055	.079
	JDMW09T320ZDSR-FT	JDMW09T320ZDSR-FT	M	S	●		●	●	●	●	●		●		.375	.156	.071	.079
	JDMW120420ZDSR-FT	JDMW120420ZDSR-FT	M	S	●		●	●	●	●	●		●		.472	.187	.098	.079
	JDMW140520ZDSR-FT	JDMW140520ZDSR-FT	M	S	●		●	●	●	●	●		●		.551	.219	.110	.079

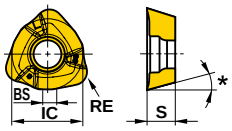
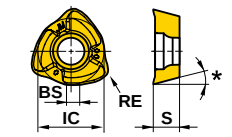
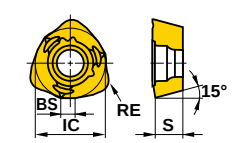
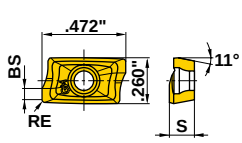
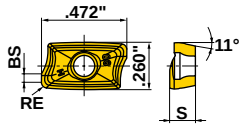
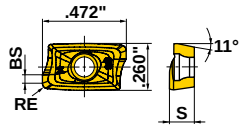
✱JOMW... : 13°, JDMW... : 15°

■ = MIRACLE SIGMA

● : Inventory maintained. ○ : Inventory maintained. (Available Winter 2015)
★ : Inventory maintained in Japan.
<10 inserts in one case>

Work Material			
	P	Steel	
	M	Stainless Steel	
	K	Cast Iron	
	N	Non-Ferrous Metal	
	S	Heat-resistant Alloy, Titanium Alloy	
	H	Hardened Materials	

Cutting Conditions :
● : Stable Cutting
◕ : General Cutting
✱ : Unstable Cutting
Honing :
E : Round **F** : Sharp
S : Chamfer + Round

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated FH7020	Coated MC5020	Coated MP6120 (NEW)	Coated MP6130 (NEW)	Coated MP7130 (NEW)	Coated MP7140 (NEW)	Coated MP9120 (NEW)	Coated MP9130 (NEW)	Coated VP15TF	Coated VP20RT	Coated VP30RT	Carbide TF15	Dimensions (inch) IC	S	BS	RE
AJX ➲K108  ✱JOMT... : 13°, JDMT... : 15°	NEW **JOMT06T218ZZER-JL**	JOMT06T218ZZER-JL	M	E					○	○	○	○					.250	.109	.047	.071
	NEW **JOMT080326ZZER-JL**	JOMT080326ZZER-JL	M	E					○	○	○	○					.315	.125	.055	.102
	NEW **JDMT09T323ZDER-JL**	JDMT09T323ZDER-JL	M	E					●	●	●	●					.375	.156	.071	.091
	NEW **JDMT120423ZDER-JL**	JDMT120423ZDER-JL	M	E					●	●	●	●					.472	.187	.098	.091
	NEW **JDMT140523ZDER-JL**	JDMT140523ZDER-JL	M	E					●	●	●	●					.551	.219	.110	.091
AJX ➲K108  ✱JOMT... : 13°, JDMT... : 15°	**JOMT06T215ZZSR-JM**	JOMT06T215ZZSR-JM	M	S	●		●	●	●	●			●		●		.250	.109	.047	.059
	JOMT080320ZZSR-JM	JOMT080320ZZSR-JM	M	S	●		●	●	●	●			●		●		.315	.125	.055	.079
	JDMT09T320ZDSR-JM	JDMT09T320ZDSR-JM	M	S	●		●	●	●	●			●		●		.375	.156	.071	.079
	JDMT120420ZDSR-JM	JDMT120420ZDSR-JM	M	S	●		●	●	●	●			●		●		.472	.187	.098	.079
	JDMT140520ZDSR-JM	JDMT140520ZDSR-JM	M	S	●		●	●	●	●			●		●		.551	.219	.110	.079
AJX ➲K108 	**JDMT120420ZDSR-ST**	JDMT120420ZDSR-ST	M	S	●		●	●	●	●			●		●		.472	.187	.098	.079
	JDMT140520ZDSR-ST	JDMT140520ZDSR-ST	M	S	●		●	●	●	●			●		●		.551	.219	.110	.079
APX3000 ➲K044 	**AOGT123602PEFR-GM**	AOGT123602PEFR-GM	G	F												●	–	.142	.071	.008
	AOGT123604PEFR-GM	AOGT123604PEFR-GM	G	F												●	–	.142	.063	.016
	AOGT123608PEFR-GM	AOGT123608PEFR-GM	G	F												●	–	.142	.047	.031
APX3000 ➲K044 	**AOMT123604PEER-H**	AOMT123604PEER-H	M	E		●	●	●	●		●	●	●	●			–	.142	.063	.016
	AOMT123608PEER-H	AOMT123608PEER-H	M	E		●	●	●	●		●	●	●	●			–	.142	.047	.031
	AOMT123616PEER-H	AOMT123616PEER-H	M	E		●	●	●	●		●	●	●	●			–	.142	.016	.063
APX3000 ➲K044 	**AOMT123602PEER-M**	AOMT123602PEER-M	M	E			●	●	●		●	●	●	●			–	.142	.071	.008
	AOMT123604PEER-M	AOMT123604PEER-M	M	E			●	●	●		●	●	●	●			–	.142	.063	.016
	AOMT123608PEER-M	AOMT123608PEER-M	M	E			●	●	●		●	●	●	●			–	.142	.047	.031
	AOMT123610PEER-M	AOMT123610PEER-M	M	E			●	●	●		●	●	★	★			–	.142	.039	.039
	AOMT123612PEER-M	AOMT123612PEER-M	M	E			●	●	●		●	●	●	●			–	.142	.031	.047
	AOMT123616PEER-M	AOMT123616PEER-M	M	E			●	●	●		●	●	●	●			–	.142	.016	.063
	AOMT123620PEER-M	AOMT123620PEER-M	M	E			●	●	●		●	●	●	●			–	.142	.016	.079
	AOMT123624PEER-M	AOMT123624PEER-M	M	E			●	●	●		●	●	●	●			–	.142	.016	.094
	AOMT123630PEER-M	AOMT123630PEER-M	M	E			●	●	●		●	●	●	●			–	.142	.016	.118
	AOMT123632PEER-M	AOMT123632PEER-M	M	E			●	●	●		●	●	●	●			–	.142	.016	.125

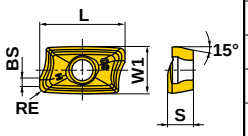
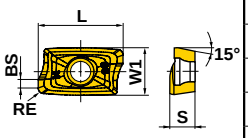
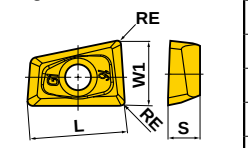
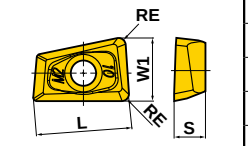
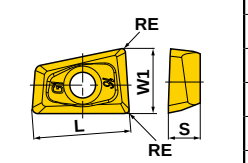
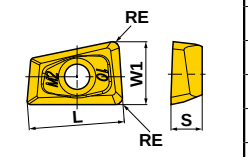
■ = MIRACLE SIGMA

MILLING INSERTS

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	
H	Hardened Materials	

Cutting Conditions :
● : Stable Cutting
◕ : General Cutting
✱ : Unstable Cutting

Honing :
E : Round **F** : Sharp

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated								Carbide	Dimensions (inch)				
					MC5020	MP6120 (NEW)	MP6130 (NEW)	MP7130 (NEW)	MP9120 (NEW)	MP9130 (NEW)	VP15TF	VP20RT	VP30RT	HTi10	L	W1	S	BS	RE
APX4000 ➲K052 	**AOMT184804PEER-H**	AOMT184804PEER-H	M	E	●	●	●	●	●	●	●	●			.709	.354	.189	.071	.016
	AOMT184808PEER-H	AOMT184808PEER-H	M	E	●	●	●	●	●	●	●	●			.709	.354	.189	.055	.031
	AOMT184816PEER-H	AOMT184816PEER-H	M	E	●	●	●	●	●	●	●	●			.709	.354	.189	.016	.063
	AOMT184832PEER-H	AOMT184832PEER-H	M	E			●	●				●			.709	.354	.189	.016	.125
	AOMT184840PEER-H	AOMT184840PEER-H	M	E			●	●				●			.709	.354	.189	.016	.157
	AOMT184850PEER-H	AOMT184850PEER-H	M	E			●	●				●			.709	.354	.189	–	.197
	AOMT184864PEER-H	AOMT184864PEER-H	M	E			●	●				●			.709	.354	.189	–	.250
APX4000 ➲K052 	**AOMT184804PEER-M**	AOMT184804PEER-M	M	E		●	●	●	●	●	●	●			.709	.354	.189	.071	.016
	AOMT184808PEER-M	AOMT184808PEER-M	M	E		●	●	●	●	●	●	●			.709	.354	.189	.055	.031
	AOMT184810PEER-M	AOMT184810PEER-M	M	E		●			●	●	★				.709	.354	.189	.039	.039
	AOMT184812PEER-M	AOMT184812PEER-M	M	E		●			●	●	●				.709	.354	.189	.031	.047
	AOMT184816PEER-M	AOMT184816PEER-M	M	E		●	●	●	●	●	●	●			.709	.354	.189	.016	.063
	AOMT184820PEER-M	AOMT184820PEER-M	M	E		●			●	●	★				.709	.354	.189	.016	.079
AQX ➲K100 	**QOGT0830R-G1**	QOGT0830R-G1	G	F ✱1							★			●	.350	.220	.120	–	.016
	QOGT0934R-G1	QOGT0934R-G1	G	F										●	.401	.264	.134	–	.016
	QOGT1443R-G1	QOGT1443R-G1	G	F										●	.528	.350	.169	–	.016
	QOGT1651R-G1	QOGT1651R-G1	G	F ✱1							★			●	.650	.433	.200	–	.016
	QOGT1959R-G1	QOGT1959R-G1	G	F										●	.768	.512	.232	–	.016
AQX ➲K100 	**QOMT0830R-M2**	QOMT0830R-M2	M	E							●	●			.350	.220	.120	–	.031
	QOMT0934R-M2	QOMT0934R-M2	M	E							●	●			.401	.264	.134	–	.031
	QOMT1443R-M2	QOMT1443R-M2	M	E							●	●			.528	.350	.169	–	.031
	QOMT1651R-M2	QOMT1651R-M2	M	E							●	●			.650	.433	.200	–	.031
	QOMT1959R-M2	QOMT1959R-M2	M	E							●	●			.768	.512	.232	–	.031
AQX (METRIC) ➲K101 	**QOGT0830R-G1**	QOGT0830R-G1	G	F ✱1							★			●	.350	.220	.120	–	.016
	QOGT1035R-G1	QOGT1035R-G1	G	F ✱1							★			★	.417	.276	.138	–	.016
	QOGT1342R-G1	QOGT1342R-G1	G	F ✱1							★			★	.516	.343	.165	–	.016
	QOGT1651R-G1	QOGT1651R-G1	G	F ✱1							★			●	.650	.433	.200	–	.016
	QOGT1856R-G1	QOGT1856R-G1	G	F ✱1							★			★	.709	.472	.220	–	.016
	QOGT2062R-G1	QOGT2062R-G1	G	F ✱1							★			★	.803	.535	.244	–	.016
	QOGT2576R-G1	QOGT2576R-G1	G	F ✱1							★			★	1.016	.677	.299	–	.016
AQX (METRIC) ➲K101 	**QOMT0830R-M2**	QOMT0830R-M2	M	E							●	●			.350	.220	.120	–	.031
	QOMT1035R-M2	QOMT1035R-M2	M	E							★	★			.417	.276	.138	–	.031
	QOMT1342R-M2	QOMT1342R-M2	M	E							★	★			.516	.343	.165	–	.031
	QOMT1651R-M2	QOMT1651R-M2	M	E							●	●			.650	.433	.200	–	.031
	QOMT1856R-M2	QOMT1856R-M2	M	E							★	★			.709	.472	.220	–	.031
	QOMT2062R-M2	QOMT2062R-M2	M	E							★	★			.803	.535	.244	–	.031
	QOMT2576R-M2	QOMT2576R-M2	M	E							★	★			1.016	.677	.299	–	.031

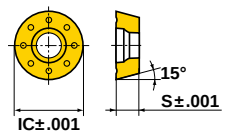
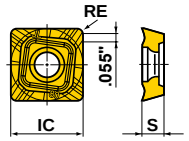
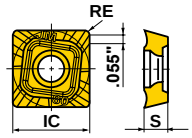
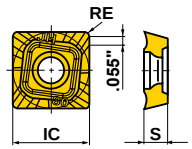
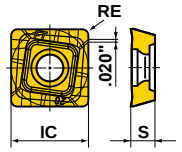
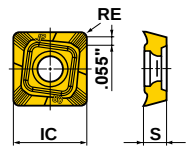
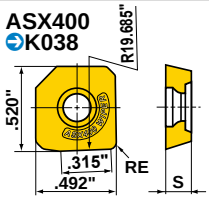
✱1 Grade VP15TF has “E” honing.

■ = MIRACLE SIGMA

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	
H	Hardened Materials	

Cutting Conditions :
● : Stable Cutting
◕ : General Cutting
✣ : Unstable Cutting
Honing :
E : Round **F** : Sharp
T : Chamfer

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated										Cermet		Carbide		Dimensions (inch)		
					F7010	F7030	MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT	MP8010	NX2525	NX4545	HTi05T	HTi10	IC	S	RE
ARX (METRIC) ➲K122 	**RDMW0517M0E**	RDMW0517M0E	G	E										★	★						.197	.067	–
	RDMW0620M0E	RDMW0620M0E	G	E										★	★						.236	.078	–
	RDMW0724M0E	RDMW0724M0E	G	E										★	★						.276	.094	–
ASX400 ➲K038 	**SOET12T308PEER-JL**	SOET12T308PEER-JL	E	E	●			●	●	●	●	●	●	●	●			●			.500	.156	.031
ASX400 ➲K038  Right hand insert shown.	**SOMT12T308PEER-JM**	SOMT12T308PEER-JM	M	E	●	●	●	●	●	●	●	●	●	●	●			●			.500	.156	.031
	SOMT12T308PEEL-JM	SOMT12T308PEEL-JM	M	E										★							.500	.156	.031
ASX400 ➲K038 	**SOMT12T308PEER-JH**	SOMT12T308PEER-JH	M	E		●	●	●	●	●	●	●	●	●	●						.500	.156	.031
ASX400 ➲K038 	**SOMT12T320PEER-FT**	SOMT12T320PEER-FT	M	E			●	●				●	●	●							.500	.156	.079
ASX400 ➲K038 	**SOGT12T308PEFR-JP**	SOGT12T308PEFR-JP	G	F															●		.500	.156	.031
ASX400 ➲K038 	**WOEW12T308PEER8C**	WOEW12T308PEER8C	E	E															●		–	.156	.031
	WOEW12T308PETR8C	WOEW12T308PETR8C	E	T													●				–	.156	.031

■ = MIRACLE SIGMA

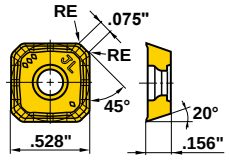
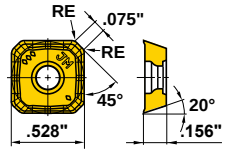
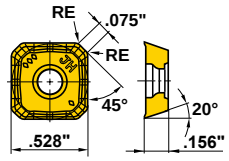
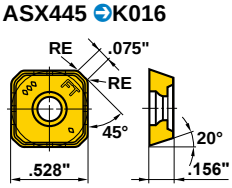
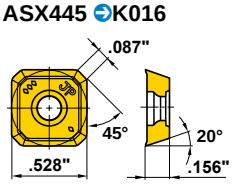
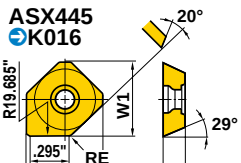
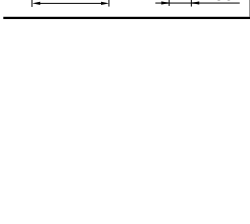
MILLING TOOL INSERTS

MILLING INSERTS

Work Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat-resistant Alloy, Titanium Alloy
	H	Hardened Materials

Cutting Conditions :
● : Stable Cutting
◕ : General Cutting
✣ : Unstable Cutting

Honing :
E : Round **F** : Sharp
S : Chamfer + Round
T : Chamfer

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated F7010	Coated F7030	Coated MC5020	Coated MP6120 (NEW)	Coated MP6130 (NEW)	Coated MP7130 (NEW)	Coated MP7140 (NEW)	Coated MP9120 (NEW)	Coated MP9130 (NEW)	Coated VP15TF	Coated VP30RT	Cermet NX2525	Cermet NX4545	Coated Cermet VP25N	Carbide HTi05T	Carbide HTi10	Dimensions (inch) L	W1	RE
ASX445 ➲K016 	**SEET13T3AGEN-JL**	SEET13T3AGEN-JL	E	E	●		●	●	●	●	●	●	●	●		●					–	–	.059
ASX445 ➲K016 	**SEMT13T3AGSN-JM**	SEMT13T3AGSN-JM	M	S	●	●	●	●	●	●	●	●	●	●	●		●				–	–	.059
ASX445 ➲K016 	**SEMT13T3AGSN-JH**	SEMT13T3AGSN-JH	M	S		●	●	●	●	●	●	●	●	●	●						–	–	.059
ASX445 ➲K016 	**SEMT13T3AGSN-FT**	SEMT13T3AGSN-FT	M	S			●														–	–	.059
ASX445 ➲K016 	**SEGT13T3AGFN-JP**	SEGT13T3AGFN-JP	G	F																●	–	–	–
ASX445 ➲K016 	**SEGT13T3AGFN-JP**	SEGT13T3AGFN-JP	G	F																	–	–	–
ASX445 ➲K016 	**WEEW13T3AGER8C**	WEEW13T3AGER8C	E	E			●							●						●	.649	.654	.059
	WEEW13T3AGTR8C	WEEW13T3AGTR8C	E	T												●	●				.649	.654	.059

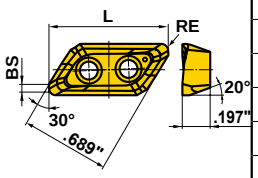
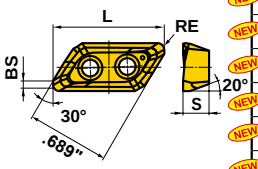
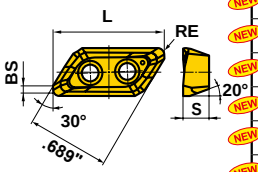
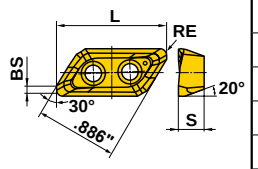
■ = MIRACLE SIGMA

● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.
<10 inserts in one case>

Work Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat-resistant Alloy, Titanium Alloy
	H	Hardened Materials

Cutting Conditions :
● : Stable Cutting
◐ : General Cutting
✣ : Unstable Cutting

Honing :
E : Round **F** : Sharp

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated MP9120 (NEW)	Coated LC15TF	Carbide TF15	Dimensions (inch) L	S	BS	RE
AXD4000 ➲K064 	**XDGX175004PDFR-GL**	XDGX175004PDFR-GL	G	F		★	●	.906	–	.067	.016
	XDGX**175008PDFR-GL**	XDGX175008PDFR-GL	G	F		★	●	.906	–	.051	.031
	XDGX**175012PDFR-GL**	XDGX175012PDFR-GL	G	F		★	●	.906	–	.035	.047
	XDGX**175016PDFR-GL**	XDGX175016PDFR-GL	G	F		★	●	.866	–	.055	.063
	XDGX**175020PDFR-GL**	XDGX175020PDFR-GL	G	F		★	●	.866	–	.039	.079
	XDGX**175024PDFR-GL**	XDGX175024PDFR-GL	G	F		★	●	.866	–	.024	.094
	XDGX**175030PDFR-GL**	XDGX175030PDFR-GL	G	F		★	●	.831	–	.031	.118
	XDGX**175032PDFR-GL**	XDGX175032PDFR-GL	G	F		★	●	.831	–	.024	.125
	XDGX**175040PDFR-GL**	XDGX175040PDFR-GL	G	F		★	●	.787	–	.031	.157
	XDGX**175050PDFR-GL**	XDGX175050PDFR-GL	G	F		★	●	.764	–	.016	.197
AXD4000 ➲K064 	(NEW) **XDGX175004PDER-GM**	XDGX175004PDER-GM	G	E	●			.906	.197	.067	.016
	(NEW) XDGX**175008PDER-GM**	XDGX175008PDER-GM	G	E	●			.906	.197	.051	.031
	(NEW) XDGX**175012PDER-GM**	XDGX175012PDER-GM	G	E	●			.906	.197	.035	.047
	(NEW) XDGX**175016PDER-GM**	XDGX175016PDER-GM	G	E	●			.866	.197	.055	.063
	(NEW) XDGX**175020PDER-GM**	XDGX175020PDER-GM	G	E	●			.866	.197	.039	.079
	(NEW) XDGX**175024PDER-GM**	XDGX175024PDER-GM	G	E	●			.866	.197	.024	.094
	(NEW) XDGX**175030PDER-GM**	XDGX175030PDER-GM	G	E	●			.831	.197	.031	.118
	(NEW) XDGX**175032PDER-GM**	XDGX175032PDER-GM	G	E	●			.831	.197	.024	.125
	(NEW) XDGX**175040PDER-GM**	XDGX175040PDER-GM	G	E	●			.787	.197	.019	.157
	(NEW) XDGX**175050PDER-GM**	XDGX175050PDER-GM	G	E	●			.764	.197	.016	.197
AXD4000 ➲K064 	(NEW) **XDGX175004PDFR-GM**	XDGX175004PDFR-GM	G	F			●	.906	.197	.067	.016
	(NEW) XDGX**175008PDFR-GM**	XDGX175008PDFR-GM	G	F			●	.906	.197	.051	.031
	(NEW) XDGX**175012PDFR-GM**	XDGX175012PDFR-GM	G	F			●	.906	.197	.035	.047
	(NEW) XDGX**175016PDFR-GM**	XDGX175016PDFR-GM	G	F			●	.866	.197	.055	.063
	(NEW) XDGX**175020PDFR-GM**	XDGX175020PDFR-GM	G	F			●	.866	.197	.039	.079
	(NEW) XDGX**175024PDFR-GM**	XDGX175024PDFR-GM	G	F			●	.866	.197	.024	.094
	(NEW) XDGX**175030PDFR-GM**	XDGX175030PDFR-GM	G	F			●	.831	.197	.031	.118
	(NEW) XDGX**175032PDFR-GM**	XDGX175032PDFR-GM	G	F			●	.831	.197	.024	.125
	(NEW) XDGX**175040PDFR-GM**	XDGX175040PDFR-GM	G	F			●	.787	.197	.019	.157
	(NEW) XDGX**175050PDFR-GM**	XDGX175050PDFR-GM	G	F			●	.764	.197	.016	.197
AXD7000 ➲K074 	**XDGX227008PDFR-GL**	XDGX227008PDFR-GL	G	F		★	●	1.181	.276	.079	.031
	XDGX**227016PDFR-GL**	XDGX227016PDFR-GL	G	F		★	●	1.181	.276	.047	.063
	XDGX**227020PDFR-GL**	XDGX227020PDFR-GL	G	F		★	●	1.181	.276	.031	.079
	XDGX**227024PDFR-GL**	XDGX227024PDFR-GL	G	F		□	●	1.181	.276	.016	.094
	XDGX**227030PDFR-GL**	XDGX227030PDFR-GL	G	F		★	●	1.134	.276	.031	.118
	XDGX**227032PDFR-GL**	XDGX227032PDFR-GL	G	F		★	●	1.134	.276	.024	.125
	XDGX**227040PDFR-GL**	XDGX227040PDFR-GL	G	F		★	●	1.083	.276	.035	.157
	XDGX**227050PDFR-GL**	XDGX227050PDFR-GL	G	F		★	●	1.063	.276	.016	.197

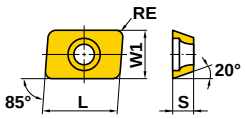
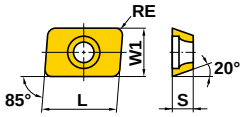
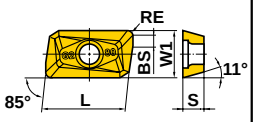
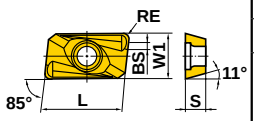
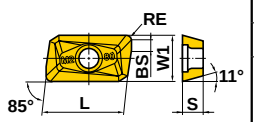
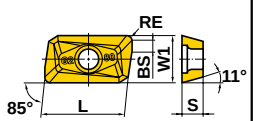
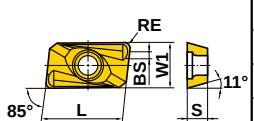
■ = MIRACLE SIGMA

MILLING INSERTS

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	
H	Hardened Materials	

Cutting Conditions :
● : Stable Cutting
◐ : General Cutting
✱ : Unstable Cutting

Honing :
E : Round **F** : Sharp

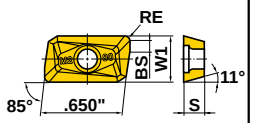
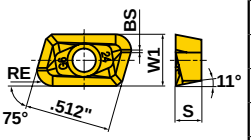
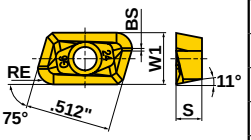
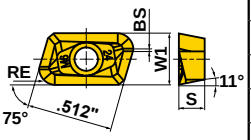
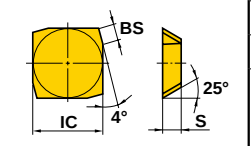
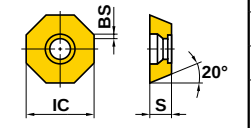
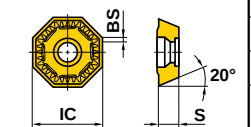
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated F7030	Coated VP15TF	Coated UP20M	Cermet NX2525	Cermet NX4545	Carbide UTi20T	Carbide HTi10	L	W1	S	BS	RE
BAE500 	**AEMW150304ER**	AEMW150304ER	M	E			●	★		●		.625	.375	.125	–	.016
	AEMW**150308ER**	AEMW150308ER	M	E			●	★		●		.625	.375	.125	–	.031
	AEMW**1503062ER**	AEMW1503062ER	M	E						●		.625	.375	.125	–	.063
	AEMW**1503093ER**	AEMW1503093ER	M	E						●		.625	.375	.125	–	.094
	AEMW**1503125ER**	AEMW1503125ER	M	E						●		.625	.375	.125	–	.125
	AEMW**1503250ER**	AEMW1503250ER	M	E						●		.625	.375	.125	–	.252
BAE600 	**AEMW19T304ER**	AEMW19T304ER	M	E			●			●		.750	.500	.156	–	.016
	AEMW**19T308ER**	AEMW19T308ER	M	E			●			●		.750	.500	.156	–	.031
	AEMW**19T3062ER**	AEMW19T3062ER	M	E						●		.750	.500	.156	–	.063
	AEMW**19T3093ER**	AEMW19T3093ER	M	E						●		.750	.500	.156	–	.094
	AEMW**19T3125ER**	AEMW19T3125ER	M	E						●		.750	.500	.156	–	.125
	AEMW**19T3250ER**	AEMW19T3250ER	M	E						●		.750	.500	.156	–	.252
BAP300 	**APGT1135PDFR-G2**	APGT1135PDFR-G2	G	F							●	.433	.250	.138	.047	.031
BAP300 	**APMT1135PDER-H1**	APMT1135PDER-H1	M	E		●		★				.433	.250	.138	.059	.016
	APMT**1135PDER-H2**	APMT1135PDER-H2	M	E	●	●		●				.433	.250	.138	.047	.031
	APMT**1135PDER-H6**	APMT1135PDER-H6	M	E	★							.433	.250	.138	.016	.094
BAP300 	**APMT1135PDER-M0**	APMT1135PDER-M0	M	E	●							.433	.250	.138	.071	.008
	APMT**1135PDER-M1**	APMT1135PDER-M1	M	E	●							.433	.250	.138	.059	.016
	APMT**1135PDER-M2**	APMT1135PDER-M2	M	E	●	●		●				.433	.250	.138	.047	.031
BAP400 	**APGT1604PDFR-G2**	APGT1604PDFR-G2	G	F							●	.650	.375	.187	.055	.031
BAP400 	**APMT1604PDER-H1**	APMT1604PDER-H1	M	E	★							.650	.375	.187	.067	.016
	APMT**1604PDER-H2**	APMT1604PDER-H2	M	E	●	●		●			●	.650	.375	.187	.055	.031
	APMT**1604PDER-H4**	APMT1604PDER-H4	M	E	★							.650	.375	.187	.016	.063
	APMT**1604PDER-H6**	APMT1604PDER-H6	M	E	★							.650	.375	.187	.016	.094
	APMT**1604PDER-H8**	APMT1604PDER-H8	M	E	★							.650	.375	.187	.016	.125

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	
H	Hardened Materials	

Cutting Conditions :
● : Stable Cutting
◐ : General Cutting
✤ : Unstable Cutting

Honing :
E : Round **F** : Sharp
S : Chamfer + Round **T** : Chamfer

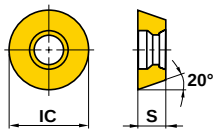
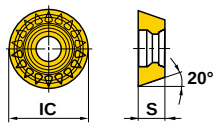
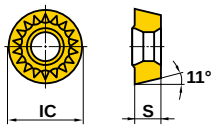
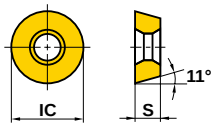
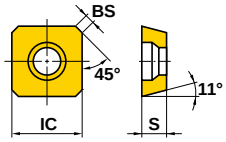
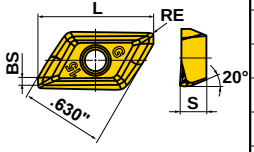
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated				Cermet		Carbide	Dimensions (inch)				
					F7010	F7030	VP15TF	AP20M	NX2525	NX4545	HTi10	W1	IC	S	BS	RE
BAP400	**APMT1604PDER-M2**	APMT1604PDER-M2	M	E		●	●			●		.375	–	.187	.055	.031
																
BAP3500	**XPGT13T3PDER-G1**	XPGT13T3PDER-G1	G	E			●					.311	–	.156	.063	.016
	**XPGT13T3PDER-G2**	XPGT13T3PDER-G2	G	E			●					.311	–	.156	.047	.031
	XPGT13T3PDER-G6	XPGT13T3PDER-G6	G	E			●					.311	–	.156	.016	.094
	XPGT13T3PDER-G75	XPGT13T3PDER-G75	G	E			●					.311	–	.156	.016	.118
	XPGT13T3PDER-G8	XPGT13T3PDER-G8	G	E			●					.311	–	.156	.016	.125
BAP3500	**XPGT13T3PDFR-G1**	XPGT13T3PDFR-G1	G	F							●	.311	–	.156	.063	.016
	**XPGT13T3PDFR-G2**	XPGT13T3PDFR-G2	G	F							●	.311	–	.156	.047	.031
	XPGT13T3PDFR-G6	XPGT13T3PDFR-G6	G	F							●	.311	–	.156	.016	.094
	XPGT13T3PDFR-G75	XPGT13T3PDFR-G75	G	F							●	.311	–	.156	.016	.118
	XPGT13T3PDFR-G8	XPGT13T3PDFR-G8	G	F							●	.311	–	.156	.016	.125
BAP3500	**XPMT13T3PDER-M1**	XPMT13T3PDER-M1	M	E		●	●					.311	–	.156	.063	.016
	**XPMT13T3PDER-M2**	XPMT13T3PDER-M2	M	E		●	●					.311	–	.156	.047	.031
	XPMT13T3PDER-M6	XPMT13T3PDER-M6	M	E		●	●					.311	–	.156	.016	.094
	XPMT13T3PDER-M75	XPMT13T3PDER-M75	M	E		●	●					.311	–	.156	.016	.118
	XPMT13T3PDER-M8	XPMT13T3PDER-M8	M	E		●	●					.311	–	.156	.016	.125
BF407	**SFAN42ZFFR2**	SFAN1203ZFFR2	A	F							★	–	.500	.125	.094	–
	**SFAN42ZFFL2**	SFAN1203ZFFL2	A	F							★	–	.500	.125	.094	–
Right hand insert shown.	**SFCN42ZFFR2**	SFCN1203ZFFR2	A	F							●	–	.500	.125	.094	–
BOE ➲K130	**OEMX12T3ETR1**	OEMX12T3ETR1	M	T						●		–	.500	.156	.039	–
	**OEMX12T3ESR1**	OEMX12T3ESR1	M	S		●						–	.500	.156	.039	–
	OEMX1705ETR1	OEMX1705ETR1	M	T	●		●			●		–	.669	.197	.055	–
	OEMX1705ESR1	OEMX1705ESR1	M	S		●						–	.669	.197	.055	–
BOE ➲K130	**OEMX12T3EER1-JS**	OEMX12T3EER1-JS	M	E		★						–	.500	.156	.039	–
	**OEMX12T3ETR1-JS**	OEMX12T3ETR1-JS	M	T					●			–	.500	.156	.039	–
	OEMX1705EER1-JS	OEMX1705EER1-JS	M	E		★						–	.669	.197	.055	–
	OEMX1705ETR1-JS	OEMX1705ETR1-JS	M	T			●	★	●			–	.669	.197	.055	–

MILLING INSERTS

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	
H	Hardened Materials	

Cutting Conditions :
● : Stable Cutting
◐ : General Cutting
✤ : Unstable Cutting

Honing :
E : Round **S** : Chamfer + Round
T : Chamfer

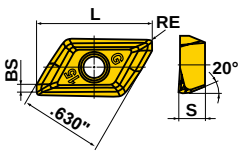
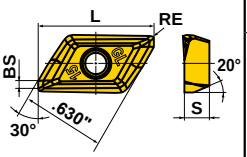
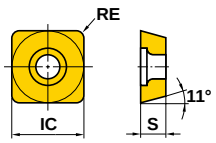
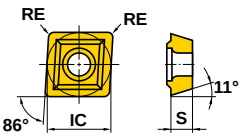
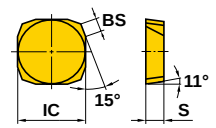
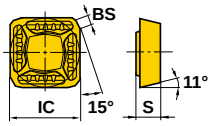
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated F7010	Coated F7030	Coated VP15TF	Coated AP20M	Coated UP20M	Carbide UTi20T	L	IC	S	BS	RE
BOE ➲K130 	**REMX12T3TN**	REMX12T3TN	M	T				★		★	–	.500	.164	–	–
	REMX**1705EN**	REMX1705EN	M	E		●					–	.679	.205	–	–
	REMX**1705SN**	REMX1705SN	M	S		★					–	.679	.205	–	–
	REMX**1705TN**	REMX1705TN	M	T				★		★	–	.679	.205	–	–
BOE ➲K130 	**REMX12T3TN-JS**	REMX12T3TN-JS	M	T				★		★	–	.500	.164	–	–
	REMX**12T3EN-JS**	REMX12T3EN-JS	M	E		●					–	.500	.164	–	–
	REMX**1705EN-JS**	REMX1705EN-JS	M	E		●					–	.679	.205	–	–
	REMX**1705TN-JS**	REMX1705TN-JS	M	T				★		★	–	.679	.205	–	–
BRP ➲K126 	**RPMT07T200E-JS**	RPMT07T200E-JS	M	E			●				–	.313	.109	–	–
	RPMT**09T300E-JS**	RPMT09T300E-JS	M	E			●				–	.375	.156	–	–
	RPMT**120400E-JS**	RPMT120400E-JS	M	E			●				–	.500	.188	–	–
	RPMT**150600E-JS**	RPMT150600E-JS	M	E			●				–	.625	.250	–	–
BRP ➲K126 	**RPMW120400E**	RPMW120400E	M	E	●		●				–	.500	.188	–	–
	RPMW**150600E**	RPMW150600E	M	E			●				–	.625	.250	–	–
BSP 	**SPMB1204APT**	SPMB1204APT	M	T					●	●	–	.500	.187	.055	–
BXD4000 ➲K080 	**XDGT1550PDER-G04**	XDGT1550PDER-G04	G	E			●				.886	–	.197	.059	.016
	XDGT**1550PDER-G08**	XDGT1550PDER-G08	G	E			●				.886	–	.197	.043	.031
	XDGT**1550PDER-G12**	XDGT1550PDER-G12	G	E			★				.886	–	.197	.028	.047
	XDGT**1550PDER-G16**	XDGT1550PDER-G16	G	E			●				.886	–	.197	.016	.063
	XDGT**1550PDER-G20**	XDGT1550PDER-G20	G	E			●				.854	–	.197	.008	.079
	XDGT**1550PDER-G30**	XDGT1550PDER-G30	G	E			●				.787	–	.197	.024	.118
	XDGT**1550PDER-G32**	XDGT1550PDER-G32	G	E			●				.787	–	.197	.016	.125
	XDGT**1550PDER-G40**	XDGT1550PDER-G40	G	E			●				.748	–	.197	.020	.157
	XDGT**1550PDER-G50**	XDGT1550PDER-G50	G	E			●				.709	–	.197	.016	.197

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

Work Material		
P	Steel	● ○
M	Stainless Steel	◔ ◔
K	Cast Iron	◔ ✣
N	Non-Ferrous Metal	✣
S	Heat-resistant Alloy, Titanium Alloy	◔
H	Hardened Materials	◔

Cutting Conditions :
● : Stable Cutting
◔ : General Cutting
✣ : Unstable Cutting

Honing :
E : Round **F** : Sharp
T : Chamfer

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated F7010	Coated MC5020	Coated VP15TF	Coated LC15TF	Coated UP20M	Cermet NX2525	Cermet NX4545	Carbide UTi20T	Carbide HTi10	Carbide TF15	Dimensions (inch) L	IC	S	BS	RE
BXD4000 ➲K080	**XDGT1550PDFR-G04**	XDGT1550PDFR-G04	G	F				★						●	.866	–	.197	.059	.016
	XDGT**1550PDFR-G08**	XDGT1550PDFR-G08	G	F				★						●	.866	–	.197	.043	.031
	XDGT**1550PDFR-G12**	XDGT1550PDFR-G12	G	F				★						★	.866	–	.197	.028	.047
	XDGT**1550PDFR-G16**	XDGT1550PDFR-G16	G	F				★						●	.866	–	.197	.016	.063
	XDGT**1550PDFR-G20**	XDGT1550PDFR-G20	G	F				★						●	.854	–	.197	.008	.079
	XDGT**1550PDFR-G30**	XDGT1550PDFR-G30	G	F				★						●	.787	–	.197	.024	.118
	XDGT**1550PDFR-G32**	XDGT1550PDFR-G32	G	F				★						●	.787	–	.197	.016	.125
	XDGT**1550PDFR-G40**	XDGT1550PDFR-G40	G	F				★						●	.748	–	.197	.020	.157
	XDGT**1550PDFR-G50**	XDGT1550PDFR-G50	G	F				★						●	.709	–	.197	.016	.197
BXD4000 ➲K080	**XDGT1550PDFR-GL04**	XDGT1550PDFR-GL04	G	F										●	.866	–	.197	.059	.016
	XDGT**1550PDFR-GL08**	XDGT1550PDFR-GL08	G	F										●	.866	–	.197	.043	.031
CFSP ➲K135	**SPMW321**	SPMW090304	M	E ★1			●	★		★★	★★	★★			–	.375	.125	–	.016
	SPMW**322**	SPMW090308	M	E ★1			★	★		★★	★★	★★			–	.375	.125	–	.031
	SPMW**421**	SPMW120304	M	E ★1			●	●		★★		● ●			–	.500	.125	–	.016
	SPMW**422**	SPMW120308	M	E ★1			●	●		★★		● ●			–	.500	.125	–	.031
ECMP ➲K134	**MPMM322**	MPMT090308	M	E			★					●			–	.375	.125	–	.031
	MPMM**432**	MPMT120408	M	E								●			–	.500	.1875	–	.031
FBP415	**SPEN42EEER1**	SPEN1203EEER1	E	E	●	●							★		–	.500	.125	.055	–
	SPEN**42EEEL1**	SPEN1203EEEL1	E	E		●							★		–	.500	.125	.055	–
Right hand insert shown.																			
FBP415	**SPER42EEER-JS**	SPER1203EEER-JS	E	E		●									–	.500	.125	.055	–
																			

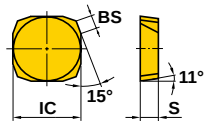
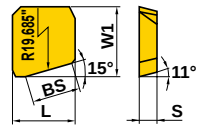
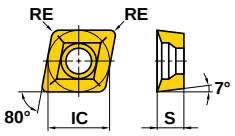
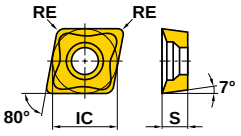
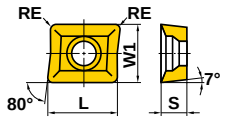
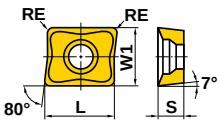
★1 Grade NX2525 and NX4545 have “T” honing.
★1 Grade HTi10 has “F” honing.

MILLING INSERTS

Work Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat-resistant Alloy, Titanium Alloy
	H	Hardened Materials

Cutting Conditions :
● : Stable Cutting
◐ : General Cutting
✠ : Unstable Cutting

Honing :
E : Round

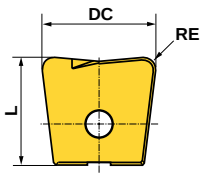
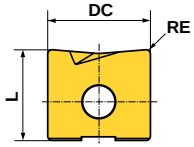
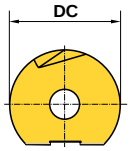
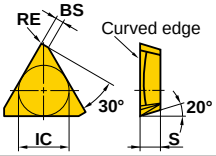
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated F7030	Coated MC5020	Coated VP15TF	Coated UP20M	Carbide HTi05T	Carbide HTi10	L	W1	IC	S	BS	RE
FBP415  Right hand insert shown.	**SPNN42EEER1**	SPNN1203EEER1	N	E		●				★	–	–	.500	.125	.055	–
	SPNN42EEEL1	SPNN1203EEEL1	N	E						★	–	–	.500	.125	.055	–
FBP415  Right hand insert shown.	**WPC42EEER10C**	WPC42EEER10C	C	E					●		.500	.597	–	.125	.394	–
	WPC42EEEL10C	WPC42EEEL10C	C	E					★		.500	.597	–	.125	.394	–
LER ➲K098 	**CCMX083508ENA**	CCMX083508EN-A	M	E	★			●			–	–	.313	.138	–	.031
	CCMX09T308ENA	CCMX09T308EN-A	M	E	●		●	●			–	–	.375	.156	–	.031
LER ➲K098 	**CCMX09T308ENB**	CCMX09T308EN-B	M	E	★						–	–	.375	.156	–	.031
LER ➲K098 	**ZCMX083508ERA**	ZCMX083508ER-A	M	E	★						.409	.313	–	.137	–	.031
	ZCMX09T308ERA	ZCMX09T308ER-A	M	E	●		●	●			.472	.375	–	.156	–	.031
LER ➲K098 	**ZCMX09T308ERB**	ZCMX09T308ER-B	M	E	★			●			.472	.375	–	.156	–	.031

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

Work Material																		
	P	Steel	●	●	◐		◐											
	M	Stainless Steel	○	◐	◐		◐											
	K	Cast Iron	●		✣	●	◐											
	N	Non-Ferrous Metal					◐											
	S	Heat-resistant Alloy, Titanium Alloy																
	H	Hardened Materials																

Cutting Conditions :
● : Stable Cutting
◐ : General Cutting
✣ : Unstable Cutting

Honing :
E : Round **F** : Sharp **T** : Chamfer

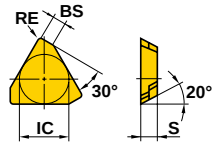
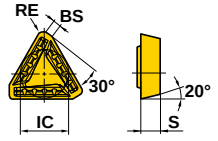
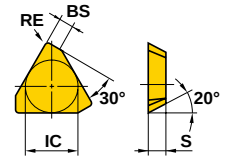
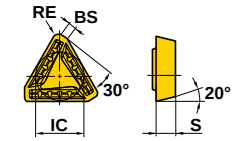
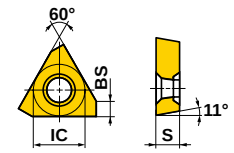
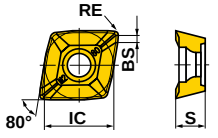
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Cermet		Carbide			Dimensions (inch)					
					NX2525	NX4545	UTi20T	HTi10	APL05	L	DC	IC	S	BS	RE
MBD ➲K147	**MBD0500021**	MBD0500021	D						●	.550	.500	–	–	–	.031
	MBD**0500041**	MBD0500041	D						●	.550	.500	–	–	–	.063
	MBD**0625021**	MBD0625021	D						●	.625	.625	–	–	–	.031
	MBD**0625041**	MBD0625041	D						●	.625	.625	–	–	–	.063
	MBD**0750021**	MBD0750021	D						●	.700	.750	–	–	–	.031
	MBD**0750041**	MBD0750041	D						●	.700	.750	–	–	–	.063
	MBD**1000021**	MBD1000021	D						●	.925	1.000	–	–	–	.031
	MBD**1000041**	MBD1000041	D						●	.925	1.000	–	–	–	.063
	MBD**1000081**	MBD1000081	D						●	.925	1.000	–	–	–	.125
MBF ➲K147	**MBF0500021**	MBF0500021	F						●	.550	.500	–	–	–	.031
	MBF**0500041**	MBF0500041	F						●	.550	.500	–	–	–	.063
	MBF**0625021**	MBF0625021	F						●	.625	.625	–	–	–	.031
	MBF**0625041**	MBF0625041	F						●	.625	.625	–	–	–	.063
	MBF**0750021**	MBF0750021	F						●	.700	.750	–	–	–	.031
	MBF**0750041**	MBF0750041	F						●	.700	.750	–	–	–	.063
	MBF**1000021**	MBF1000021	F						●	.925	1.000	–	–	–	.031
	MBF**1000041**	MBF1000041	F						●	.925	1.000	–	–	–	.063
	MBF**1000081**	MBF1000081	F						●	.925	1.000	–	–	–	.125
MBN ➲K146	**MBN0312001**	MBN0312001	N						●	–	.312	–	–	–	–
	MBN**0375001**	MBN0375001	N						●	–	.375	–	–	–	–
	MBN**0500001**	MBN0500001	N						●	–	.500	–	–	–	–
	MBN**0625001**	MBN0625001	N						●	–	.625	–	–	–	–
	MBN**0750001**	MBN0750001	N						●	–	.750	–	–	–	–
	MBN**1000001**	MBN1000001	N						●	–	1.000	–	–	–	–
	MBN**1250001**	MBN1250001	N						●	–	1.250	–	–	–	–
	MBN**M200001**	MBNM200001	N						●	–	.787	–	–	–	–
	MBN**M300001**	MBNM300001	N						●	–	1.181	–	–	–	–
NSE300 **For improved wall accuracy** 	**TECN32PEFR1W**	TECN1603PEFR1W	C	F			★			–	–	.375	.125	.055	.016
	TECN**32PEER1W**	TECN1603PEER1W	C	E			★			–	–	.375	.125	.055	.016
	TECN**32PETR1W**	TECN1603PETR1W	C	T	★	★	★			–	–	.375	.125	.055	.016

MILLING INSERTS

Work Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat-resistant Alloy, Titanium Alloy
	H	Hardened Materials

Cutting Conditions :
● : Stable Cutting
◐ : General Cutting
✲ : Unstable Cutting

Honing :
E : Round **F** : Sharp
S : Chamfer + Round **T** : Chamfer

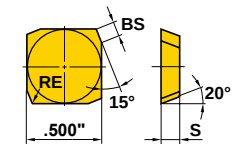
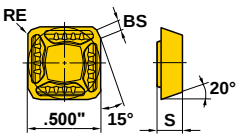
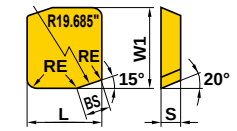
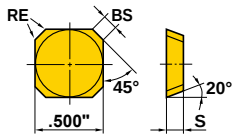
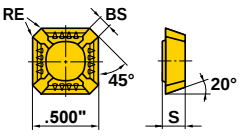
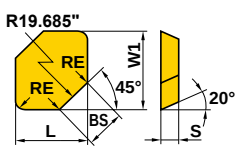
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated F7030	Coated MC5020	Coated VP15TF	Coated UP20M	Coated AP10H	Cermet NX2525	Cermet NX4545	Carbide UTi20T	Carbide HTi10	IC	S	BS	RE
NSE300 	**TEEN32PEFR1**	TEEN1603PEFR1	E	F									●	.375	.125	.055	.016
	TEEN32PEER1	TEEN1603PEER1	E	E			●						●	.375	.125	.055	.016
	TEEN32PETR1	TEEN1603PETR1	E	T				●		★	●	●		.375	.125	.055	.016
	TEEN32PESR1	TEEN1603PESR1	E	S	●	★								.375	.125	.055	.016
NSE300 	**TEER32PEER-JS**	TEER1603PEER-JS	E	E	●							★		.375	.125	.055	.016
NSE400 SE400 	**TECN43PEFR1**	TECN2204PEFR1	C	F									●	.500	.187	.055	.039
	TECN43PEER1	TECN2204PEER1	C	E									★	.500	.187	.055	.039
	TECN43PETR1	TECN2204PETR1	C	T						★	★	★		.500	.187	.055	.039
	TEEN43PEFR1	TEEN2204PEFR1	E	F									●	.500	.187	.055	.039
	TEEN43PEER1	TEEN2204PEER1	E	E			●						●	.500	.187	.055	.039
	TEEN43PETR1	TEEN2204PETR1	E	T				●		●	●	●		.500	.187	.055	.039
	TEEN43PESR1	TEEN2204PESR1	E	S	●	★								.500	.187	.055	.039
	TEKN43PEER1	TEKN2204PEER1	K	E									★	.500	.187	.076	–
	TEKN43PESR1	TEKN2204PESR1	K	S	★									.500	.187	.076	–
	TEKN43PETR1	TEKN2204PETR1	K	T				★		★		★		.500	.187	.076	–
	TEKN43PETR	TEKN2204PETR	K	T							★			.500	.187	.076	–
NSE400 SE400 	**TEER43PEER-JS**	TEER2204PEER-JS	E	E	★					□		★		.500	.187	.055	.039
PMF ➔K161 	**TPEW1303ZPER2**	TPEW1303ZPER2	E	E			●		●					.313	.125	.079	–
PMR ➔K160 	**CPMT1205ZPEN-M2**	CPMT1205ZPEN-M2	M	E			●							.500	.219	.055	.031
	CPMT1205ZPEN-M3	CPMT1205ZPEN-M3	M	E			★							.500	.219	.055	.047

● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.
<10 inserts in one case>

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	
H	Hardened Materials	

Cutting Conditions :
● : Stable Cutting
◐ : General Cutting
✱ : Unstable Cutting

Honing :
E : Round **F** : Sharp **S** : Chamfer + Round
T : Chamfer **X** : Round (Small)

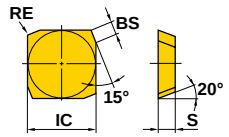
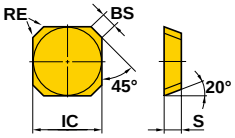
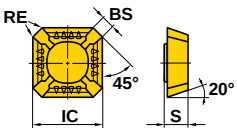
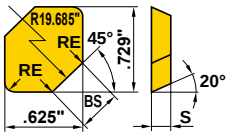
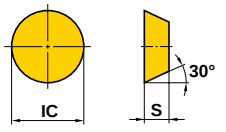
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated				Cermet		Carbide			Dimensions (inch)				
					F7010	F7030	MC5020	VP15TF	NX2525	NX4545	UTi20T	HTi05T	HT110	L	W1	S	BS	RE
SE415	**SEEN42EFFR1**	SEEN1203EFFR1	E	F									●	–	–	.125	.055	.039
	**SEEN42EFER1**	SEEN1203EFER1	E	E	●			●						–	–	.125	.055	.039
	SEEN42EFTR1	SEEN1203EFTR1	E	T					●	●				–	–	.125	.055	.039
	SEEN42EFSR1	SEEN1203EFSR1	E	S		★	★							–	–	.125	.055	.039
	SEKN42EFSR1	SEKN1203EFSR1	K	S		★								–	–	.125	.055	–
	SEKN42EFTR1	SEKN1203EFTR1	K	T							★			–	–	.125	.055	–
Right hand insert shown.	**SEKN42EFTR**	SEKN1203EFTR	K	F						★				–	–	.125	.071	.039
SE415	**SEER42EFER-JS**	SEER1203EFER-JS	E	E		★	★							–	–	.125	.055	.039
																		
SE415	**WEC42EFER5C**	WEC42EFER5C	C	E								★		.500	.540	.125	.197	.039
	**WEC42EFTR5C**	WEC42EFTR5C	C	T					●					.500	.540	.125	.197	.039
SE445	**SECN42AFTN1**	SECN1203AFTN1	C	T						★				–	–	.125	.055	.039
	**SEEN42AFFN1**	SEEN1203AFFN1	E	F									●	–	–	.125	.055	.039
	SEEN42AFEN1	SEEN1203AFEN1	E	E				●						–	–	.125	.055	.039
	SEEN42AFTN1	SEEN1203AFTN1	E	T	●			●	●	●				–	–	.125	.055	.039
	SEEN42AFSN1	SEEN1203AFSN1	E	S		●	●	●						–	–	.125	.055	.039
	SEEN42AFXN1	SEEN1203AFXN1	E	X				●						–	–	.125	.055	.039
	SEKN42AFSN1	SEKN1203AFSN1	K	S		★								–	–	.125	.055	–
	SEKN42AFTN1	SEKN1203AFTN1	K	T							★			–	–	.125	.055	–
	SEKN42AFTN	SEKN1203AFTN	K	T						★				–	–	.125	.067	.039
SE445	**SEER42AFEN-JS**	SEER1203AFEN-JS	E	E	●	●	●	●						–	–	.125	.055	.039
	**SEER42AFXN-JS**	SEER1203AFXN-JS	E	X				●						–	–	.125	.055	.039
SE445	**WEC42AFTR5C**	WEC42AFTR5C	C	T					●					.500	.604	.125	.197	.039
																		

MILLING INSERTS

Work Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat-resistant Alloy, Titanium Alloy
	H	Hardened Materials

Cutting Conditions :
● : Stable Cutting
◐ : General Cutting
✲ : Unstable Cutting

Honing :
E : Round **S** : Chamfer + Round
T : Chamfer

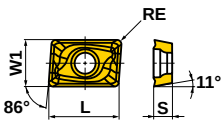
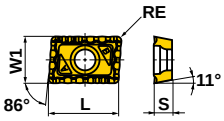
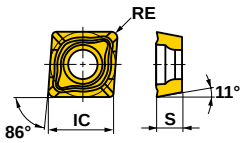
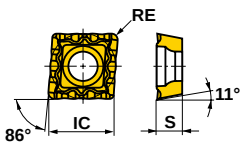
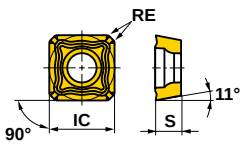
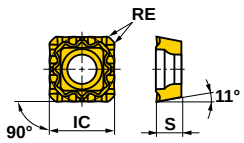
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated F7010	Coated F7030	Coated MC5020	Coated VP15TF	Coated UP20M	Cermet NX2525	Cermet NX4545	Carbide UTi20T	Carbide HTi05T	IC	S	BS	RE
SE515 	**SEEN53EFER1**	SEEN1504EFER1	E	E				★						.625	.187	.055	.039
SE545 	**SEEN53AFEN1**	SEEN1504AFEN1	E	E				●						.625	.187	.055	.039
	SEEN53AFTN1	SEEN1504AFTN1	E	T	●					●	●			.625	.187	.055	.039
	SEEN53AFSN1	SEEN1504AFSN1	E	S		●	●							.625	.187	.055	.039
	SEKN53AFSN1	SEKN1504AFSN1	K	S		★								.625	.187	.055	–
	SEKN53AFTN1	SEKN1504AFTN1	K	T								★		.625	.187	.055	–
SE545 	**SEER53AFEN-JS**	SEER1504AFEN-JS	E	E		★	★							.625	.187	.055	.039
SE545 	**WEC53AFER5C**	WEC53AFER5C	C	E									●	–	.187	.197	.039
	WEC53AFTR5C	WEC53AFTR5C	C	T							★			–	.187	.197	.039
SG20 	**RGEN2004EN**	RGEN2004M0EN	E	E	★									.787	.187	–	–
	RGEN2004SN	RGEN2004M0SN	E	S				★				★		.787	.187	–	–

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	
H	Hardened Materials	

Cutting Conditions :
● : Stable Cutting
◕ : General Cutting
✠ : Unstable Cutting

Honing :
E : Round

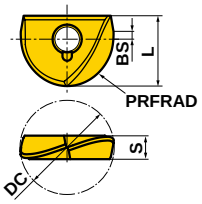
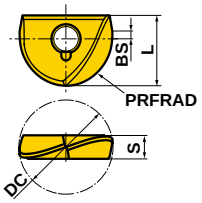
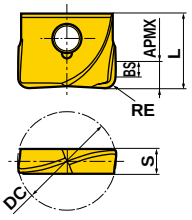
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated		Dimensions (inch)				
					VP15TF	VP20RT	L	W1	IC	S	RE
SPX ➲K084 	**JPMX140412-JM**	JPMX140412-JM	M	E	●	●	.563	.500	–	.187	.047
	JPMX190412-JM	JPMX190412-JM	M	E	●	●	.750	.500	–	.187	.047
SPX ➲K084 	**JPMX140412-WH**	JPMX140412-WH	M	E	●	●	.563	.500	–	.187	.047
	JPMX190412-WH	JPMX190412-WH	M	E	●	●	.750	.500	–	.187	.047
SPX ➲K084 	**MPMX120412-JM**	MPMX120412-JM	M	E	●	●	–	–	.500	.187	.047
SPX ➲K084 	**MPMX120412-WH**	MPMX120412-WH	M	E	●	●	–	–	.500	.187	.047
SPX ➲K084 	**SPMX120408-JM**	SPMX120408-JM	M	E	●	●	–	–	.500	.187	.031
SPX ➲K084 	**SPMX120408-WH**	SPMX120408-WH	M	E	●	●	–	–	.500	.187	.031

MILLING INSERTS

Work Material			EP6120	VP15TF	MP8010
	P	Steel	●	●	
	M	Stainless Steel		◐	
	K	Cast Iron		✱	●
	N	Non-Ferrous Metal	◐		
	S	Heat-resistant Alloy, Titanium Alloy		◐	
	H	Hardened Materials		◐	●

Cutting Conditions :
● : Stable Cutting
◐ : General Cutting
✱ : Unstable Cutting

Honing :
F : Sharp

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated EP6120 (NEW)	Coated VP15TF	Coated MP8010	L	DC	S	BS	RE	PRFRAD	APMX
SRF ➲K136 	**SRFT0375**	SRFT0375	–	F	●	●	●	.335	.375	.102	.020	–	.1875	–
	SRFT**0500**	SRFT0500	–	F	●	●	●	.394	.500	.118	.020	–	.2500	–
	SRFT**0625**	SRFT0625	–	F	●	●	●	.472	.622	.158	.039	–	.3125	–
	SRFT**0750**	SRFT0750	–	F	●	●	●	.591	.750	.197	.039	–	.3750	–
	SRFT**1000**	SRFT1000	–	F	●	●	●	.728	1.000	.236	.039	–	.5000	–
	SRFT**1250**	SRFT1250	–	F	●	●	●	.925	1.250	.276	.039	–	.6250	–
SRF (METRIC) ➲K138 	**SRFT10**	SRFT10	–	F	★	★	★	.335	.394	.102	.020	–	.1969	–
	SRFT**12**	SRFT12	–	F	★	★	★	.394	.472	.118	.020	–	.2362	–
	SRFT**16**	SRFT16	–	F	★	★	★	.472	.630	.157	.039	–	.3150	–
	SRFT**20**	SRFT20	–	F	★	★	★	.591	.787	.197	.039	–	.3937	–
	SRFT**25**	SRFT25	–	F	★	★	★	.728	.984	.236	.039	–	.4921	–
	SRFT**30**	SRFT30	–	F	★	★	★	.886	1.181	.276	.039	–	.5906	–
	SRFT**32**	SRFT32	–	F	★	★	★	.925	1.260	.276	.039	–	.6299	–
SUF (METRIC) ➲K138 	**SUFT10R05**	SUFT10R05	–	F	★	★	★	.335	.394	.102	.039	.0197	–	.0591
	SUFT**10R10**	SUFT10R10	–	F	★	★	★	.335	.394	.102	.039	.0394	–	.0787
	SUFT**10R20**	SUFT10R20	–	F	★	★	★	.335	.394	.102	.039	.0787	–	.1181
	SUFT**12R05**	SUFT12R05	–	F	★	★	★	.394	.472	.118	.047	.0197	–	.0669
	SUFT**12R10**	SUFT12R10	–	F	★	★	★	.394	.472	.118	.047	.0394	–	.0866
	SUFT**12R20**	SUFT12R20	–	F	★	★	★	.394	.472	.118	.047	.0787	–	.1260
	SUFT**12R30**	SUFT12R30	–	F	★	★	★	.394	.472	.118	.047	.1181	–	.1654
	SUFT**16R05**	SUFT16R05	–	F	★	★	★	.472	.630	.157	.063	.0197	–	.0827
	SUFT**16R10**	SUFT16R10	–	F	★	★	★	.472	.630	.157	.063	.0394	–	.1024
	SUFT**16R15**	SUFT16R15	–	F	★	★	★	.472	.630	.157	.063	.0591	–	.1220
	SUFT**16R20**	SUFT16R20	–	F	★	★	★	.472	.630	.157	.063	.0787	–	.1417
	SUFT**16R30**	SUFT16R30	–	F	★	★	★	.472	.630	.157	.063	.1181	–	.1811
	SUFT**20R05**	SUFT20R05	–	F	★	★	★	.591	.787	.197	.079	.0197	–	.0984
	SUFT**20R10**	SUFT20R10	–	F	★	★	★	.591	.787	.197	.079	.0394	–	.1181
	SUFT**20R15**	SUFT20R15	–	F	★	★	★	.591	.787	.197	.079	.0591	–	.1378
	SUFT**20R20**	SUFT20R20	–	F	★	★	★	.591	.787	.197	.079	.0787	–	.1575
	SUFT**20R30**	SUFT20R30	–	F	★	★	★	.591	.787	.197	.079	.1181	–	.1969
	SUFT**25R05**	SUFT25R05	–	F	★	★	★	.728	.984	.236	.098	.0197	–	.1181
	SUFT**25R10**	SUFT25R10	–	F	★	★	★	.728	.984	.236	.098	.0394	–	.1378
	SUFT**25R20**	SUFT25R20	–	F	★	★	★	.728	.984	.236	.098	.0787	–	.1772
	SUFT**25R30**	SUFT25R30	–	F	★	★	★	.728	.984	.236	.098	.1181	–	.2165
	SUFT**30R05**	SUFT30R05	–	F	★	★	★	.886	1.181	.276	.118	.0197	–	.1378
	SUFT**30R10**	SUFT30R10	–	F	★	★	★	.886	1.181	.276	.118	.0394	–	.1575
	SUFT**30R20**	SUFT30R20	–	F	★	★	★	.886	1.181	.276	.118	.0787	–	.1969
	SUFT**30R30**	SUFT30R30	–	F	★	★	★	.886	1.181	.276	.118	.1181	–	.2362
	SUFT**32R05**	SUFT32R05	–	F	★	★	★	.925	1.26	.276	.126	.0197	–	.1457
	SUFT**32R10**	SUFT32R10	–	F	★	★	★	.925	1.26	.276	.126	.0394	–	.1772
	SUFT**32R20**	SUFT32R20	–	F	★	★	★	.925	1.26	.276	.126	.0787	–	.2047

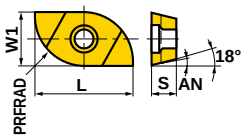
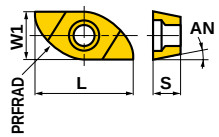
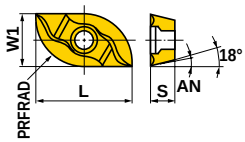
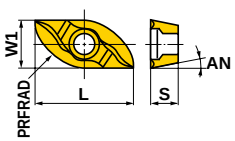
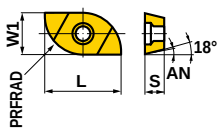
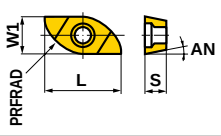
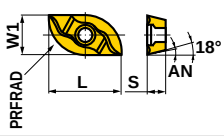
● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

■ = MIRACLE SIGMA

Work Material			
	P	Steel	
	M	Stainless Steel	
	K	Cast Iron	
	N	Non-Ferrous Metal	
	S	Heat-resistant Alloy, Titanium Alloy	
	H	Hardened Materials	

CCutting Conditions :
● : Stable Cutting
: General Cutting
: Unstable Cutting

Honing :
E : Round

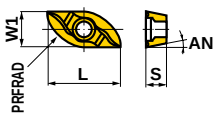
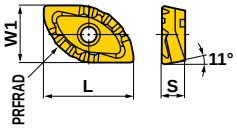
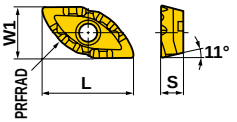
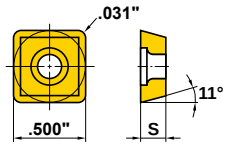
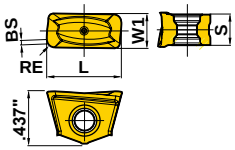
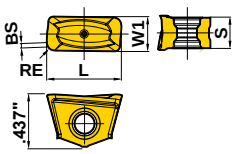
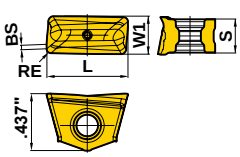
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated VP15TF	Dimensions (inch) L	W1	S	PRFRAD	AN
SRM2 ➲K150 	**SRM212C**	SRM212C	M	E	●	.748	.385	.169	.375	11°
	SRM**216C**	SRM216C	M	E	●	.945	.512	.216	.500	11°
	SRM**220C**	SRM220C	M	E	●	1.102	.638	.275	.625	11°
SRM2 ➲K150 	**SRM212E**	SRM212E	M	E	●	.610	.315	.169	.375	11°
	SRM**216E**	SRM216E	M	E	●	.807	.409	.216	.500	11°
	SRM**220E**	SRM220E	M	E	●	.964	.520	.275	.625	11°
SRM2 ➲K150 	**SRM210C-M**	SRM210C-M	M	E	●	.630	.323	.138	.313	11°
	SRM**212C-M**	SRM212C-M	M	E	●	.748	.385	.169	.375	11°
	SRM**216C-M**	SRM216C-M	M	E	●	.945	.512	.216	.500	11°
	SRM**220C-M**	SRM220C-M	M	E	●	1.102	.638	.275	.625	11°
SRM2 ➲K150 	**SRM210E-M**	SRM210E-M	M	E	●	.531	.258	.138	.313	11°
	SRM**212E-M**	SRM212E-M	M	E	●	.610	.315	.169	.375	11°
	SRM**216E-M**	SRM216E-M	M	E	●	.807	.409	.216	.500	11°
	SRM**220E-M**	SRM220E-M	M	E	●	.964	.520	.275	.625	11°
SRM2 (METRIC) ➲K152 	**SRG16C**	SRG16C	G	E	★	.630	.323	.138	.315	11°
	SRG**20C**	SRG20C	G	E	★	.748	.402	.181	.394	10°
	SRG**25C**	SRG25C	G	E	★	.945	.504	.217	.492	10°
	SRG**30C**	SRG30C	G	E	★	1.102	.602	.276	.591	10°
	SRG**32C**	SRG32C	G	E	★	1.102	.642	.276	.630	10°
SRM2 (METRIC) ➲K152 	**SRG16E**	SRG16E	G	E	★	.531	.264	.138	.315	11°
	SRG**20E**	SRG20E	G	E	★	.610	.335	.181	.394	9°
	SRG**25E**	SRG25E	G	E	★	.807	.402	.217	.492	9°
	SRG**30E**	SRG30E	G	E	★	.992	.480	.276	.591	9°
	SRG**32E**	SRG32E	G	E	★	1.028	.516	.276	.630	9°
SRM2 (METRIC) ➲K152 	**SRM16C-M**	SRM16C-M	M	E	★	.630	.323	.138	.315	11°
	SRM**20C-M**	SRM20C-M	M	E	★	.748	.402	.181	.394	10°
	SRM**25C-M**	SRM25C-M	M	E	★	.945	.504	.217	.492	10°
	SRM**30C-M**	SRM30C-M	M	E	★	1.102	.602	.276	.591	10°
	SRM**32C-M**	SRM32C-M	M	E	★	1.102	.642	.276	.630	10°

MILLING INSERTS

Work Material		
P	Steel	● ● ● ●
M	Stainless Steel	◔ ◔ ✱ ◔
K	Cast Iron	✱ ✱
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	● ● ●
H	Hardened Materials	◔

Cutting Conditions :
● : Stable Cutting
◔ : General Cutting
✱ : Unstable Cutting

Honing :
E : Round

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated					Carbide	Dimensions (inch)						
					VP15TF	MP9030	MP9130	VP20RT	VP30RT	UP20M	UTi20T	L	W1	S	BS	RE	PRFRAD	AN
SRM2 (METRIC) ➲K152 	**SRM16E-M**	SRM16E-M	M	E	★							.531	.264	.138	–	–	.315	11°
	SRM**20E-M**	SRM20E-M	M	E	★							.610	.335	.181	–	–	.394	9°
	SRM**25E-M**	SRM25E-M	M	E	★							.807	.402	.217	–	–	.492	9°
	SRM**30E-M**	SRM30E-M	M	E	★							.992	.480	.276	–	–	.591	9°
	SRM**32E-M**	SRM32E-M	M	E	★							1.028	.516	.276	–	–	.630	9°
SRM2 40/50 (METRIC) ➲K156 	**SRG40C**	SRG40C	G	E	★			★	★			1.417	.807	.315	–	–	.787	–
	SRG**50C**	SRG50C	G	E	★			★	★			1.575	1.024	.335	–	–	.984	–
SRM2 40/50 (METRIC) ➲K156 	**SRG40E**	SRG40E	G	E	★			★	★			1.260	.654	.315	–	–	.787	–
	SRG**50E**	SRG50E	G	E	★			★	★			1.409	.787	.335	–	–	.984	–
TBE2 	**SPMM432A**	SPMT120408-A	M	E						●	●	–	–	.187	–	–	–	–
VFX5 ➲K090 	**XNMU160708R-MS**	XNMU160708R-MS	M	E		●						.630	.276	.256	.039	.031	–	–
	XNMU**160712R-MS**	XNMU160712R-MS	M	E		●						.630	.276	.256	.039	.047	–	–
	XNMU**160716R-MS**	XNMU160716R-MS	M	E		●						.630	.276	.256	.039	.063	–	–
	XNMU**160724R-MS**	XNMU160724R-MS	M	E		●						.630	.276	.256	.039	.094	–	–
	XNMU**160732R-MS**	XNMU160732R-MS	M	E		●						.681	.276	.256	–	.126	–	–
	XNMU**160740R-MS**	XNMU160740R-MS	M	E		●						.744	.276	.256	–	.157	–	–
VFX5 ➲K090 	**XNMU160708R-HS**	XNMU160708R-HS	M	E		●						.630	.276	.256	.039	.031	–	–
VFX5 ➲K090 	**XNMU160708R-LS**	XNMU160708R-LS	M	E			●					.630	.276	.256	.039	.031	–	–

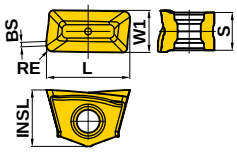
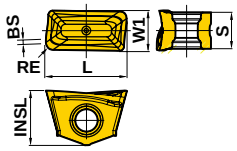
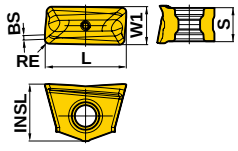
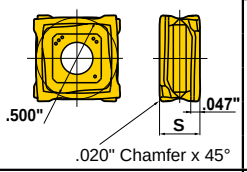
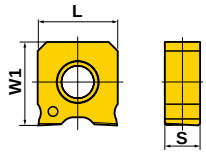
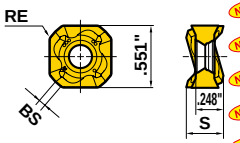
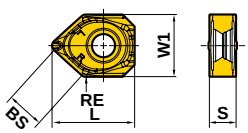
■ = MIRACLE SIGMA

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	
H	Hardened Materials	

Cutting Conditions :
● : Stable Cutting
◐ : General Cutting
✱ : Unstable Cutting

Honing :
E : Round **F** : Sharp

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated								Carbide	Dimensions (inch)					
					MC5020	MP6120 (NEW)	MP6130 (NEW)	MP7130 (NEW)	MP9120 (NEW)	VP15TF	VP20RT	MP9030	MP9130	TF15	L	W1	INSL	S	BS	RE
VFX6 ➲K094 	**XNMU190912R-MS**	XNMU190912R-MS	M	E								●			.752	.374	.500	.335	.039	.047
	XNMU190916R-MS	XNMU190916R-MS	M	E								●			.752	.374	.500	.335	.039	.063
	XNMU190924R-MS	XNMU190924R-MS	M	E								●			.752	.374	.500	.335	.039	.094
	XNMU190932R-MS	XNMU190932R-MS	M	E								●			.795	.374	.500	.335	–	.126
	XNMU190940R-MS	XNMU190940R-MS	M	E								●			.858	.374	.500	.335	–	.157
	XNMU190950R-MS	XNMU190950R-MS	M	E								●			.858	.374	.500	.335	–	.197
VFX6 ➲K094 	**XNMU190912R-HS**	XNMU190912R-HS	M	E								●			.752	.374	.500	.335	.039	.047
VFX6 ➲K094 	**XNMU190912R-LS**	XNMU190912R-LS	M	E									●		.752	.374	.500	.335	.039	.047
VOX400 ➲K033 	**SONX1206PER**	SONX1206PER	N	E	●					●					–	–	–	.248	–	–
VOX400 ➲K033 	**WOEX1206PER5C**	WOEX1206PER5C	E	E						●					.492	.513	–	.217	–	–
WSX445 ➲K008 	NEW **SNMU140812ANER-M**	SNMU140812ANER-M	M	E	●	●	●	●	●	★	★				–	–	–	.331	.059	.047
	NEW **SNMU140812ANER-R**	SNMU140812ANER-R	M	E	●	●	●			★	★				–	–	–	.331	.059	.047
	NEW **SNMU140812ANER-H**	SNMU140812ANER-H	M	E	●	●	●			★	★				–	–	–	.331	.059	.047
	NEW **SNGU140812ANER-L**	SNGU140812ANER-L	G	E		●	●	●	●	★	★				–	–	–	.331	.059	.047
	NEW **SNGU140812ANER-M**	SNGU140812ANER-M	G	E		●	●	●	●	★	★				–	–	–	.331	.059	.047
	NEW **SNGU140812ANFR-L**	SNGU140812ANFR-L	G	F										●	–	–	–	.331	.059	.047
WSX445 ➲K008 	NEW **WNGU1406ANEN8C-M**	WNGU1406ANEN8C-M	G	E		●				●					.713	.551	–	.236	.315	.039

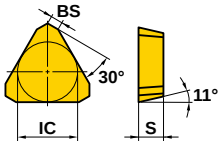
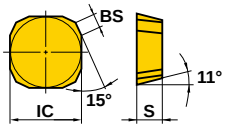
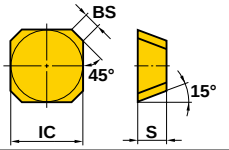
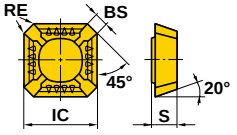
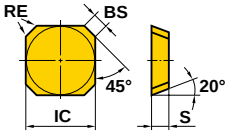
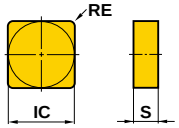
■ = MIRACLE SIGMA

MILLING INSERTS

Work Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat-resistant Alloy, Titanium Alloy
	H	Hardened Materials

Cutting Conditions :
● : Stable Cutting
◐ : General Cutting
✲ : Unstable Cutting

Honing :
E : Round **F** : Sharp
T : Chamfer

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated F7010	Coated F7030	Coated MC5020	Coated VP15TF	Coated UP20M	Cermet NX2525	Cermet NX4545	Carbide UTi20T	Carbide HTi10	Dimensions (inch) IC	S	BS	RE
Corner Angle 0° 11° Positive  Right hand insert shown.	**TPKN32PPR**	TPKN1603PPR	K	T ✲1	●			★	●	●	●	●	●	.375	.125	.047	–
	TPKN43PDR	TPKN2204PDR	K	T ✲1	●			●	●	●	●	●	●	.500	.187	.055	–
Corner Angle 15° 11° Positive 	**SPKN42EDR**	SPKN1203EDR	K	T ✲2	●	●	●			●		●	●	.500	.125	.055	–
	SPKN53EDR	SPKN1504EDR	K	T ✲2				★	●	★		●	●	.625	.187	.055	–
Corner Angle 45° 15° Positive 	**SDEN42AEN**	SDEN1203AEN	E	T						★				.500	.125	.047	–
	SDKN42AEN	SDKN1203AEN	K	T		★		★				★	★	.500	.125	.047	–
	SDKN42AETN	SDKN1203AETN	K	T						★				.500	.125	.047	–
	SDKN53AETN	SDKN1504AETN	K	T						★				.625	.187	.047	–
Corner Angle 45° 20° Positive 	**SEER43AFEN-JS**	SEER1204AFEN-JS	E	E	●									.500	.187	.055	.039
Corner Angle 45° 20° Positive 	**SEKN42AGTN**	SEKN1203AGTN	K	T						★				.500	.125	.067	.039
Negative 	**SNMN432**	SNMN120408	M	E			★			★		★	★	.500	.187	–	.031
	SNMN433	SNMN120412	M	E			★			★		★		.500	.187	–	.047

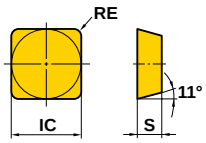
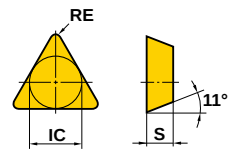
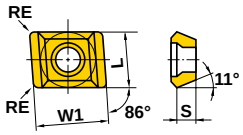
✲1 Grade F7030 has “E” honing.
✲2 Grade HTi10 has “F” honing.

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-Ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	
H	Hardened Materials	

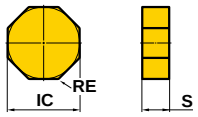
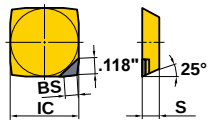
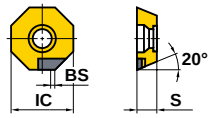
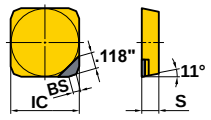
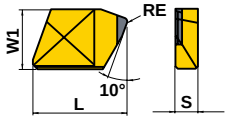
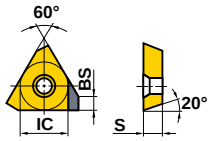
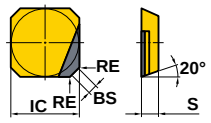
Cutting Conditions :
● : Stable Cutting
◕ : General Cutting
✱ : Unstable Cutting

Honing :
E : Round **F** : Sharp
T : Chamfer

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated F7030	Coated MC5020	Coated VP15TF	Coated UP20M	Cermet NX2525	Carbide UTi20T	Carbide HTi10	L	W1	IC	S	RE
11° Positive 	**SPMN421**	SPMN120304	M	E✱1			★			★	★	–	–	.500	.125	.016
	SPMN421T	SPMN120304T	M	T					★			–	–	.500	.125	.016
	SPMN422	SPMN120308	M	E	★		●			●	●	–	–	.500	.125	.031
	SPMN423	SPMN120312	M	E✱1	★		★			★	★	–	–	.500	.125	.047
	SPMN432	SPMN120408	M	E		★				★	★	–	–	.500	.187	.031
	SPMN433	SPMN120412	M	E		★				●		–	–	.500	.187	.047
	SPMN532	SPMN150408	M	E						★		–	–	.625	.187	.031
11° Positive 	**TPMN321**	TPMN160304	M	E✱2	★		●	★	★	●	●	–	–	.375	.125	.016
	TPMN322	TPMN160308	M	E✱2	★		●	★	★	●	●	–	–	.375	.125	.031
	TPMN323	TPMN160312	M	E✱1				★			●	–	–	.375	.125	.047
	TPMN431	TPMN220404	M	E						●		–	–	.500	.187	.031
	TPMN432	TPMN220408	M	E✱1	★		●	★		●	★	–	–	.500	.187	.031
	TPMN433	TPMN220412	M	E✱1	★		★			●	●	–	–	.500	.187	.047
	**JPMT060204-E**	JPMT060204-E	M	E			★	★				.256	.313	–	.098	.016

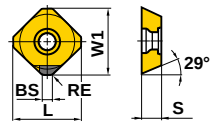
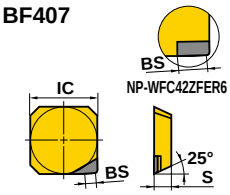
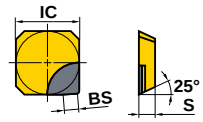
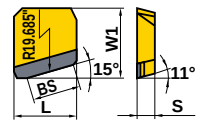
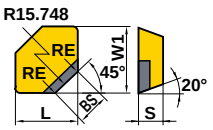
✱1 Grade HTi10 has “F” honing.
✱2 Grade HTi10 has “F” honing, grade NX2525 has “T” honing.

CBN AND PCD

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	CBN				PCD	Dimensions (inch)					
				MB710	MB730	MB835	BC5030	MD220	L	W1	IC	S	BS	RE
AOX445 ➔**K032** 	**SL-ONEN120404ASN**	SL-ONEN120404ASN	E				★		–	–	.500	.187	–	.016
BF407 	**SFCN42ZFFR2**	SFCN1203ZFFR2	C					●	–	–	.500	.125	.094	–
BOE ➔**K130** 	**OEMX12T3ETR1**	OEMX12T3ETR1	M		●	●			–	–	.500	.156	.039	–
	OEMX12T3ETR5	OEMX12T3ETR5	M		●	●			–	–	.500	.156	.197	–
FBP415 	**SPEN42EETR1**	SPEN1203EETR1	E	★					–	–	.500	.125	.055	–
NF10000 	**NP-GDCN2004PDSR3**	NP-GDCN2004PDSR3	C		★			★	.787	.500	–	.187	–	.031
PMF ➔**K161** 	**TPEW1303ZPTR2**	TPEW1303ZPTR2	E	●					–	–	.313	.125	.079	–
SE445 	**SECN42AFFR1**	SECN1203AFFR1	C					●	–	–	.500	.125	.055	.039

● : Inventory maintained. ★ : Inventory maintained in Japan.
<1 insert in one case>

CBN AND PCD WITH WIPER

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	CBN MB710	PCD MD220	Dimensions (inch) L	W1	IC	S	BS	RE
ASX445 ➔**K019** 	**NP-WEEW13T3AGFR3C**	NP-WEEW13T3AGFR3C	E		●	.649	.651	–	.156	.118	.059
	NP-WEEW13T3AGTR3C	NP-WEEW13T3AGTR3C	E	●		.649	.651	–	.156	.118	.059
BF407 	**NP-WFC42ZFER2**	NP-WFC42ZFER2	C		●	–	–	.500	.125	.094	–
	NP-WFC42ZFER6	NP-WFC42ZFER6	C		●	–	–	.500	.125	.236	–
BF407 	**WFC42ZFER2**	WFC42ZFER2	C		★	–	–	.500	.125	.094	–
FBP415 	**WPC42EETR10C**	WPC42EETR10C	C	●		.500	.597	–	.125	.394	–
SE445 	**WEC42AFFR5C**	WEC42AFFR5C	C		●	.500	.604	–	.125	.197	.039
	WEC42AFTR5C	WEC42AFTR5C	C	●		.500	.604	–	.125	.197	.039

CLASSIFICATION

Order Number	(ISO) Number	Cutter Type	Page
AEMW150304ER	AEMW150304ER	**BAE500**	J020
AEMW**150308ER**	AEMW150308ER		
AEMW**1503062ER**	AEMW1503062ER		
AEMW**1503093ER**	AEMW1503093ER		
AEMW**1503125ER**	AEMW1503125ER		
AEMW**1503250ER**	AEMW1503250ER		
AEMW19T304ER	AEMW19T304ER	**BAE600**	J020
AEMW**19T308ER**	AEMW19T308ER		
AEMW**19T3062ER**	AEMW19T3062ER		
AEMW**19T3093ER**	AEMW19T3093ER		
AEMW**19T3125ER**	AEMW19T3125ER		
AEMW**19T3250ER**	AEMW19T3250ER		
AOGT123602PEFR-GM	AOGT123602PEFR-GM	**APX3000** ➔**K044**	J015
AOGT**123604PEFR-GM**	AOGT123604PEFR-GM		
AOGT**123608PEFR-GM**	AOGT123608PEFR-GM		
AOMT123604PEER-H	AOMT123604PEER-H		J015
AOMT**123608PEER-H**	AOMT123608PEER-H		
AOMT**123616PEER-H**	AOMT123616PEER-H		
AOMT123602PEER-M	AOMT123602PEER-M		J015
AOMT**123604PEER-M**	AOMT123604PEER-M		
AOMT**123608PEER-M**	AOMT123608PEER-M		
AOMT**123610PEER-M**	AOMT123610PEER-M		
AOMT**123612PEER-M**	AOMT123612PEER-M		
AOMT**123616PEER-M**	AOMT123616PEER-M		
AOMT**123620PEER-M**	AOMT123620PEER-M		
AOMT**123624PEER-M**	AOMT123624PEER-M		
AOMT**123630PEER-M**	AOMT123630PEER-M		
AOMT**123632PEER-M**	AOMT123632PEER-M		
AOMT184804PEER-H	AOMT184804PEER-H	**APX4000** ➔**K052**	J016
AOMT**184808PEER-H**	AOMT184808PEER-H		
AOMT**184816PEER-H**	AOMT184816PEER-H		
AOMT**184832PEER-H**	AOMT184832PEER-H		
AOMT**184840PEER-H**	AOMT184840PEER-H		
AOMT**184850PEER-H**	AOMT184850PEER-H		
AOMT**184864PEER-H**	AOMT184864PEER-H		
AOMT184804PEER-M	AOMT184804PEER-M		J016
AOMT**184808PEER-M**	AOMT184808PEER-M		
AOMT**184810PEER-M**	AOMT184810PEER-M		
AOMT**184812PEER-M**	AOMT184812PEER-M		
AOMT**184816PEER-M**	AOMT184816PEER-M		
AOMT**184820PEER-M**	AOMT184820PEER-M		
APGT1135PDFR-G2	APGT1135PDFR-G2	**BAP300**	J020
APMT1135PDER-H1	APMT1135PDER-H1		J020
APMT**1135PDER-H2**	APMT1135PDER-H2		
APMT**1135PDER-H6**	APMT1135PDER-H6		

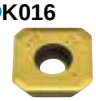
Order Number	(ISO) Number	Cutter Type	Page
APMT1135PDER-M0	APMT1135PDER-M0	**BAP300**	J020
APMT**1135PDER-M1**	APMT1135PDER-M1		
APMT**1135PDER-M2**	APMT1135PDER-M2		
APGT1604PDFR-G2	APGT1604PDFR-G2	**BAP400**	J020
APMT1604PDER-H1	APMT1604PDER-H1		J020
APMT**1604PDER-H2**	APMT1604PDER-H2		
APMT**1604PDER-H4**	APMT1604PDER-H4		
APMT**1604PDER-H6**	APMT1604PDER-H6		
APMT**1604PDER-H8**	APMT1604PDER-H8		
APMT1604PDER-M2	APMT1604PDER-M2		J021
CCMX083508ENA	CCMX083508EN-A	**LER** ➔**K098**	J024
CCMX**09T308ENA**	CCMX09T308EN-A		
CCMX09T308ENB	CCMX09T308EN-B		J024
CPMT1205ZPEN-M2	CPMT1205ZPEN-M2	**PMR** ➔**K160**	J026
CPMT**1205ZPEN-M3**	CPMT1205ZPEN-M3		
JOMW06T215ZZSR-FT	JOMW06T215ZZSR-FT	**AJX** ➔**K108**	J014
JOMW**080320ZZSR-FT**	JOMW080320ZZSR-FT		
JDMW09T320ZDSR-FT	JDMW09T320ZDSR-FT		
JDMW**120420ZDSR-FT**	JDMW120420ZDSR-FT		
JDMW**140520ZDSR-FT**	JDMW140520ZDSR-FT		
NEW **JDMT09T323ZDER-JL**	JDMT09T323ZDER-JL		J015
NEW JDMT**120423ZDER-JL**	JDMT120423ZDER-JL		
NEW JDMT**140523ZDER-JL**	JDMT140523ZDER-JL		
JOMT06T215ZZSR-JM	JOMT06T215ZZSR-JM		J015
JOMT**080320ZZSR-JM**	JOMT080320ZZSR-JM		
JDMT09T320ZDSR-JM	JDMT09T320ZDSR-JM		
JDMT**120420ZDSR-JM**	JDMT120420ZDSR-JM		
JDMT**140520ZDSR-JM**	JDMT140520ZDSR-JM		
JDMT120420ZDSR-ST	JDMT120420ZDSR-ST		J015
JDMT**140520ZDSR-ST**	JDMT140520ZDSR-ST		
JPMT060204-E	JPMT060204-E		J035

Order Number	(ISO) Number	Cutter Type	Page
JPMX140412-JM	JPMX140412-JM	**SPX** ➔**K084**	J029
JPMX**190412-JM**	JPMX190412-JM		
JPMX140412-WH	JPMX140412-WH		J029
JPMX**190412-WH**	JPMX190412-WH		
MBD0500021	MBD0500021	**MBD** ➔**K147**	J025
MBD**0500041**	MBD0500041		
MBD**0625021**	MBD0625021		
MBD**0625041**	MBD0625041		
MBD**0750021**	MBD0750021		
MBD**0750041**	MBD0750041		
MBD**1000021**	MBD1000021		
MBD**1000041**	MBD1000041		
MBD**1000081**	MBD1000081		
MBF0500021	MBF0500021	**MBF** ➔**K147**	J025
MBF**0500041**	MBF0500041		
MBF**0625021**	MBF0625021		
MBF**0625041**	MBF0625041		
MBF**0750021**	MBF0750021		
MBF**0750041**	MBF0750041		
MBF**1000021**	MBF1000021		
MBF**1000041**	MBF1000041		
MBF**1000081**	MBF1000081		
MBN0312001	MBN0312001	**MBN** ➔**K146**	J025
MBN**0375001**	MBN0375001		
MBN**0500001**	MBN0500001		
MBN**0625001**	MBN0625001		
MBN**0750001**	MBN0750001		
MBN**1000001**	MBN1000001		
MBN**1250001**	MBN1250001		
MBN**M200001**	MBNM200001		
MBN**M300001**	MBNM300001		
MPMM322	MPMT090308	**ECMP** ➔**K134**	J023
MPMM**432**	MPMT120408		
MPMX120412-JM	MPMX120412-JM	**SPX** ➔**K084**	J029
			
MPMX120412-WH	MPMX120412-WH		J029
			

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NNMU**200608ZEN-MK**	NNMU200608ZEN-MK		
NNMU200708ZEN-MP	NNMU200708ZEN-MP	**AHX640S** ➔**K024**	J014
			
NNMU200712ZER-MM	NNMU200712ZER-MM		J014
			
NP-GDCN2004PDSR3	NP-GDCN2004PDSR3	**NF10000**	J036
			
NP-WEEW13T3AGFR3C	NP-WEEW13T3AGFR3C	**ASX445** ➔**K016**	J037
NP-WEEW**13T3AGTR3C**	NP-WEEW13T3AGTR3C		
NP-WFC42ZFER2	NP-WFC42ZFER2	**BF407**	J037
NP-WFC**42ZFER6**	NP-WFC42ZFER6		
OEMX12T3ETR1	OEMX12T3ETR1	**BOE** ➔**K130**	J021
OEMX**12T3ESR1**	OEMX12T3ESR1		
OEMX1705ETR1	OEMX1705ETR1		J021
OEMX**1705ESR1**	OEMX1705ESR1		
OEMX12T3EER1-JS	OEMX12T3EER1-JS		
OEMX**12T3ETR1-JS**	OEMX12T3ETR1-JS		
OEMX1705EER1-JS	OEMX1705EER1-JS		
OEMX**1705ETR1-JS**	OEMX1705ETR1-JS		
OEMX12T3ETR1	OEMX12T3ETR1		J036
OEMX**12T3ETR5**	OEMX12T3ETR5		
QOGT0830R-G1	QOGT0830R-G1	**AQX** ➔**K100**	J016
QOGT**0934R-G1**	QOGT0934R-G1		
QOGT**1443R-G1**	QOGT1443R-G1		
QOGT**1651R-G1**	QOGT1651R-G1		
QOGT**1959R-G1**	QOGT1959R-G1		
QOMT0830R-M2	QOMT0830R-M2		J016
QOMT**0934R-M2**	QOMT0934R-M2		
QOMT**1443R-M2**	QOMT1443R-M2		
QOMT**1651R-M2**	QOMT1651R-M2		
QOMT**1959R-M2**	QOMT1959R-M2		

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QOGT1035R-G1	QOGT1035R-G1		
QOGT1342R-G1	QOGT1342R-G1		
QOGT1651R-G1	QOGT1651R-G1		
QOGT1856R-G1	QOGT1856R-G1		
QOGT2062R-G1	QOGT2062R-G1		
QOGT2576R-G1	QOGT2576R-G1		
QOMT0830R-M2	QOMT0830R-M2		J016
QOMT1035R-M2	QOMT1035R-M2		
QOMT1342R-M2	QOMT1342R-M2		
QOMT1651R-M2	QOMT1651R-M2		
QOMT1856R-M2	QOMT1856R-M2		
QOMT2062R-M2	QOMT2062R-M2		
QOMT2576R-M2	QOMT2576R-M2		
RDMW0517M0E	RDMW0517M0E	**ARX(METRIC)** ➲**K122** 	J017
RDMW0620M0E	RDMW0620M0E		
RDMW0724M0E	RDMW0724M0E		
REMX12T3TN	REMX12T3TN	**BOE** ➲**K130** 	J022
REMX1705EN	REMX1705EN		
REMX1705SN	REMX1705SN		
REMX1705TN	REMX1705TN		
REMX12T3EN-JS	REMX12T3EN-JS		J022
REMX12T3TN-JS	REMX12T3TN-JS		
REMX1705EN-JS	REMX1705EN-JS		
REMX1705TN-JS	REMX1705TN-JS		
RGEN2004EN	RGEN2004M0EN	**SG20** 	J028
RGEN2004SN	RGEN2004M0SN		
RPMT07T200E-JS	RPMT07T200E-JS	**BRP** ➲**K126** 	J022
RPMT09T300E-JS	RPMT09T300E-JS		
RPMT120400E-JS	RPMT120400E-JS		
RPMT150600E-JS	RPMT150600E-JS		
RPMW120400E	RPMW120400E		J022
RPMW150600E	RPMW150600E		
SDEN42AEN	SDEN1203AEN	**Corner Angle 45° 15° Positive** 	J034
SDKN42AEN	SDKN1203AEN		
SDKN42AETN	SDKN1203AETN		
SDKN53AETN	SDKN1504AETN	**Corner Angle 45° 15° Positive** 	J034

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SEEN42EFTR1	SEEN1203EFTR1		
SEEN42EFSR1	SEEN1203EFSR1		
SEKN42EFSR1	SEKN1203EFSR1		J027
SEKN42EFTR1	SEKN1203EFTR1		
SEKN42EFTR	SEKN1203EFTR		
SEER42EFER-JS	SEER1203EFER-JS		J027
SECN42AFTN1	SECN1203AFTN1	**SE445** 	J027
SEEN42AFFN1	SEEN1203AFFN1		
SEEN42AFEN1	SEEN1203AFEN1		
SEEN42AFTN1	SEEN1203AFTN1		
SEEN42AFSN1	SEEN1203AFSN1		
SEEN42AFXN1	SEEN1203AFXN1		
SEKN42AFSN1	SEKN1203AFSN1		
SEKN42AFTN1	SEKN1203AFTN1		
SEKN42AFTN	SEKN1203AFTN		
SEER42AFEN-JS	SEER1203AFEN-JS		J027
SEER42AFXN-JS	SEER1203AFXN-JS		
SECN42AFFR1	SECN1203AFFR1	**SE445** 	J036
SEEN53EFER1	SEEN1504EFER1	**SE515** 	J028
SEEN53AFEN1	SEEN1504AFEN1	**SE545** 	J028
SEEN53AFTN1	SEEN1504AFTN1		
SEEN53AFSN1	SEEN1504AFSN1		
SEKN53AFSN1	SEKN1504AFSN1		
SEKN53AFTN1	SEKN1504AFTN1		
SEER53AFEN-JS	SEER1504AFEN-JS		J028
SEET13T3AGEN-JL	SEET13T3AGEN-JL	**ASX445** ➲**K016** 	J018
SEMT13T3AGSN-JM	SEMT13T3AGSN-JM		J018

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SEGT13T3AGFN-JP	SEGT13T3AGFN-JP		J018
SEER43AFEN-JS	SEER1204AFEN-JS	Corner Angle 45° 20° Positive 	J034
SEKN42AGTN	SEKN1203AGTN	Corner Angle 45° 20° Positive 	J034
SFAN42ZFFR2	SFAN1203ZFFR2	**BF407** 	J021
SFAN42ZFFL2	SFAN1203ZFFL2		
SFCN42ZFFR2	SFCN1203ZFFR2		
SFCN42ZFFR2	SFCN1203ZFFR2		J036
SL-ONEN120404ASN	SL-ONEN120404ASN	**AOX445** ➔**K032** 	J036
SNMN432	SNMN120408	**Negative** 	J034
SNMN433	SNMN120412		
NEW **SNMU140812ANER-M**	SNMU140812ANER-M	**WSX445** ➔**K008** 	J033
NEW **SNMU140812ANER-R**	SNMU140812ANER-R		
NEW **SNMU140812ANER-H**	SNMU140812ANER-H		
NEW **SNGU140812ANER-L**	SNGU140812ANER-L		
NEW **SNGU140812ANER-M**	SNGU140812ANER-M		
NEW **SNGU140812ANFR-L**	SNGU140812ANFR-L		
NEW **WNGU1406ANEN8C-M**	WNGU1406ANEN8C-M		J033
SOET12T308PEER-JL	SOET12T308PEER-JL	**ASX400** ➔**K038** 	J017

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SOMT12T308PEER-JH	SOMT12T308PEER-JH		J017
SOMT12T320PEER-FT	SOMT12T320PEER-FT		J017
SOGT12T308PEFR-JP	SOGT12T308PEFR-JP		J017
SONX1206PER	SONX1206PER	**VOX400** ➔**K033** 	J033
SPEN42EEER1	SPEN1203EEER1	**FBP415** 	J023 J024
SPEN42EEEL1	SPEN1203EEEL1		
SPNN42EEER1	SPNN1203EEER1		
SPNN42EEEL1	SPNN1203EEEL1		
SPER42EEER-JS	SPER1203EEER-JS	**FBP415** 	J023
SPEN42EETR1	SPEN1203EETR1		J036
SPKN42EDR	SPKN1203EDR	Corner Angle 15° 11° Positive 	J034
SPKN53EDR	SPKN1504EDR		
SPMB1204APT	SPMB1204APT	**BSP** 	J022
SPMM432A	SPMT120408-A	**TBE** 	J032
SPMN421	SPMN120304	**11° Positive** 	J035
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SPMN432	SPMN120408		
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SPMW421	SPMW120304		
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SPMX120408-JM	SPMX120408-JM	**SPX** ➔**K084** 	J029
SPMX120408-WH	SPMX120408-WH		J029
SRFT0375	SRFT0375	**SRF** ➔**K136** 	J030
SRFT0500	SRFT0500		
SRFT0625	SRFT0625		
SRFT0750	SRFT0750		
SRFT1000	SRFT1000		
SRFT1250	SRFT1250		
SRFT10	SRFT10	**SRF(METRIC)** ➔**K138** 	J030
SRFT12	SRFT12		
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SRFT25	SRFT25		
SRFT30	SRFT30		
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SRG40C	SRG40C	**SRM2 40/50** ➔**K156** 	J032
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SRG40E	SRG40E		J032
SRG50E	SRG50E		
SRG16C	SRG16C	**SRM2(METRIC)** ➔**K152** 	J031
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SRG25C	SRG25C		
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SRG32C	SRG32C		
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SRG20E	SRG20E		
SRG25E	SRG25E		
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SRM212C	SRM212C	**SRM2** ➔**K150** 	J031
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SRM216C-M	SRM216C-M		
SRM220C-M	SRM220C-M		
SRM210E-M	SRM210E-M		J031
SRM212E-M	SRM212E-M		
SRM216E-M	SRM216E-M		
SRM220E-M	SRM220E-M		
SRM16C-M	SRM16C-M	**SRM2(METRIC)** ➔**K152** 	J031
SRM20C-M	SRM20C-M		
SRM25C-M	SRM25C-M		
SRM30C-M	SRM30C-M		
SRM32C-M	SRM32C-M		
SRM16E-M	SRM16E-M		J032
SRM20E-M	SRM20E-M		
SRM25E-M	SRM25E-M		
SRM30E-M	SRM30E-M		
SRM32E-M	SRM32E-M		
SUFT10R05	SUFT10R05	**SUF(METRIC)** ➔**K138** 	J030
SUFT10R10	SUFT10R10		
SUFT10R20	SUFT10R20		
SUFT12R05	SUFT12R05		
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SUFT30R05	SUFT30R05		
SUFT30R10	SUFT30R10		
SUFT30R20	SUFT30R20		
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TEEN32PEFR1	TEEN1603PEFR1	**NSE300**	J026
TEEN32PEER1	TEEN1603PEER1		
TEEN32PETR1	TEEN1603PETR1		
TEEN32PESR1	TEEN1603PESR1		
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TECN43PEFR1	TECN2204PEFR1	**NSE400** **SE400**	J026
TECN43PEER1	TECN2204PEER1		
TECN43PETR1	TECN2204PETR1		
TEEN43PEFR1	TEEN2204PEFR1		
TEEN43PEER1	TEEN2204PEER1		
TEEN43PETR1	TEEN2204PETR1		
TEEN43PESR1	TEEN2204PESR1		
TEKN43PEER1	TEKN2204PEER1		
TEKN43PESR1	TEKN2204PESR1		
TEKN43PETR1	TEKN2204PETR1		
TEKN43PETR	TEKN2204PETR		
TEER43PEER-JS	TEER2204PEER-JS		J026
TPEW1303ZPER2	TPEW1303ZPER2	**PMF** ➔**K161**	J026
TPEW1303ZPTR2	TPEW1303ZPTR2	**PMF** ➔**K161**	J036
TPKN32PPR	TPKN1603PPR	**Corner Angle 0° 11° Positive**	J034
TPKN43PDR	TPKN2204PDR		
TPMN321	TPMN160304	**11° Positive**	J035
TPMN322	TPMN160308		
TPMN323	TPMN160312		
TPMN431	TPMN220404		
TPMN432	TPMN220408		
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WEC42AFTR5C	WEC42AFTR5C		
WEC53AFER5C	WEC53AFER5C	**SE545**	J028
WEC53AFTR5C	WEC53AFTR5C		
WEEW13T3AGER8C	WEEW13T3AGER8C	**ASX445** ➔**K016**	J018
WEEW13T3AGTR8C	WEEW13T3AGTR8C		
WFC42ZFER2	WFC42ZFER2	**BF407**	J037
WNEU2006ZEN7C-WK	WNEU2006ZEN7C-WK	**AHX640S** ➔**K024** **AHX640W** ➔**K029**	J014
WNEU2007ZEN7C-WP	WNEU2007ZEN7C-WP	**AHX640S** ➔**K024**	J014
WOEW12T308PEER8C	WOEW12T308PEER8C	**ASX400** ➔**K038**	J017
WOEW12T308PETR8C	WOEW12T308PETR8C		
WOEX1206PER5C	WOEX1206PER5C	**VOX400** ➔**K033**	J033
WPC42EEER10C	WPC42EEER10C	**FBP415**	J024
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WPC42EETR10C	WPC42EETR10C		J037

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XDGT**1550PDER-G12**	XDGT1550PDER-G12		
XDGT**1550PDER-G16**	XDGT1550PDER-G16		
XDGT**1550PDER-G20**	XDGT1550PDER-G20		
XDGT**1550PDER-G30**	XDGT1550PDER-G30		
XDGT**1550PDER-G32**	XDGT1550PDER-G32		
XDGT**1550PDER-G40**	XDGT1550PDER-G40		
XDGT**1550PDER-G50**	XDGT1550PDER-G50		
XDGT1550PDFR-G04	XDGT1550PDFR-G04		J023
XDGT**1550PDFR-G08**	XDGT1550PDFR-G08		
XDGT**1550PDFR-G12**	XDGT1550PDFR-G12		
XDGT**1550PDFR-G16**	XDGT1550PDFR-G16		
XDGT**1550PDFR-G20**	XDGT1550PDFR-G20		
XDGT**1550PDFR-G30**	XDGT1550PDFR-G30		
XDGT**1550PDFR-G32**	XDGT1550PDFR-G32		
XDGT**1550PDFR-G40**	XDGT1550PDFR-G40		
XDGT**1550PDFR-G50**	XDGT1550PDFR-G50		
XDGT1550PDFR-GL04	XDGT1550PDFR-GL04		J023
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XDGX175004PDFR-GL	XDGX175004PDFR-GL	**AXD4000** ➔K064	J019
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XDGX**175012PDFR-GL**	XDGX175012PDFR-GL		
XDGX**175016PDFR-GL**	XDGX175016PDFR-GL		
XDGX**175020PDFR-GL**	XDGX175020PDFR-GL		
XDGX**175024PDFR-GL**	XDGX175024PDFR-GL		
XDGX**175030PDFR-GL**	XDGX175030PDFR-GL		
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XDGX**175040PDFR-GL**	XDGX175040PDFR-GL		
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NEW **XDGX175004PDER-GM**	XDGX175004PDER-GM		J019
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NEW XDGX**175012PDER-GM**	XDGX175012PDER-GM		
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NEW XDGX**175040PDER-GM**	XDGX175040PDER-GM		
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NEW **XDGX175004PDFR-GM**	XDGX175004PDFR-GM		J019
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NEW XDGX**175012PDFR-GM**	XDGX175012PDFR-GM		
NEW XDGX**175016PDFR-GM**	XDGX175016PDFR-GM		
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NEW XDGX**175030PDFR-GM**	XDGX175030PDFR-GM		
NEW XDGX**175032PDFR-GM**	XDGX175032PDFR-GM		
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XDGX**227020PDFR-GL**	XDGX227020PDFR-GL		
XDGX**227024PDFR-GL**	XDGX227024PDFR-GL		
XDGX**227030PDFR-GL**	XDGX227030PDFR-GL		
XDGX**227032PDFR-GL**	XDGX227032PDFR-GL		
XDGX**227040PDFR-GL**	XDGX227040PDFR-GL		
XDGX**227050PDFR-GL**	XDGX227050PDFR-GL		
XNMU160708R-MS	XNMU160708R-MS	**VFX5** ➔K090	J032
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XNMU**160716R-MS**	XNMU160716R-MS		
XNMU**160724R-MS**	XNMU160724R-MS		
XNMU**160732R-MS**	XNMU160732R-MS		
XNMU**160740R-MS**	XNMU160740R-MS		
XNMU160708R-HS	XNMU160708R-HS		
XNMU160708R-LS	XNMU160708R-LS		
XNMU190912R-MS	XNMU190912R-MS	**VFX6** ➔K094	J033
XNMU**190916R-MS**	XNMU190916R-MS		
XNMU**190924R-MS**	XNMU190924R-MS		
XNMU**190932R-MS**	XNMU190932R-MS		
XNMU**190940R-MS**	XNMU190940R-MS		
XNMU**190950R-MS**	XNMU190950R-MS		
XNMU190912R-HS	XNMU190912R-HS		
XNMU190912R-LS	XNMU190912R-LS		
XPGT13T3PDER-G1	XPGT13T3PDER-G1	**BAP3500**	J021
XPGT**13T3PDER-G2**	XPGT13T3PDER-G2		
XPGT**13T3PDER-G6**	XPGT13T3PDER-G6		
XPGT**13T3PDER-G75**	XPGT13T3PDER-G75		
XPGT**13T3PDER-G8**	XPGT13T3PDER-G8		
XPGT13T3PDFR-G1	XPGT13T3PDFR-G1		J021
XPGT**13T3PDFR-G2**	XPGT13T3PDFR-G2		
XPGT**13T3PDFR-G6**	XPGT13T3PDFR-G6		
XPGT**13T3PDFR-G75**	XPGT13T3PDFR-G75		
XPGT**13T3PDFR-G8**	XPGT13T3PDFR-G8		
XPMT13T3PDER-M1	XPMT13T3PDER-M1		J021
XPMT**13T3PDER-M2**	XPMT13T3PDER-M2		
XPMT**13T3PDER-M6**	XPMT13T3PDER-M6		
XPMT**13T3PDER-M75**	XPMT13T3PDER-M75		
XPMT**13T3PDER-M8**	XPMT13T3PDER-M8		

Order Number	(ISO) Number	Cutter Type	Page
ZCMX083508ERA	ZCMX083508ER-A	**LER** ➲**K098** 	J024
ZCMX**09T308ERA**	ZCMX09T308ER-A		
ZCMX09T308ERB	ZCMX09T308ER-B		J024

GUIDE TO MILLING TOOLS

●Section organization

①Organized according to cutting mode for milling.
(Refer to the index on the next page.)

PHOTO OF PRODUCT

TYPE

APPLICATION

PRODUCT SECTION

PRODUCT FEATURES

CORNER ANGLE ICON

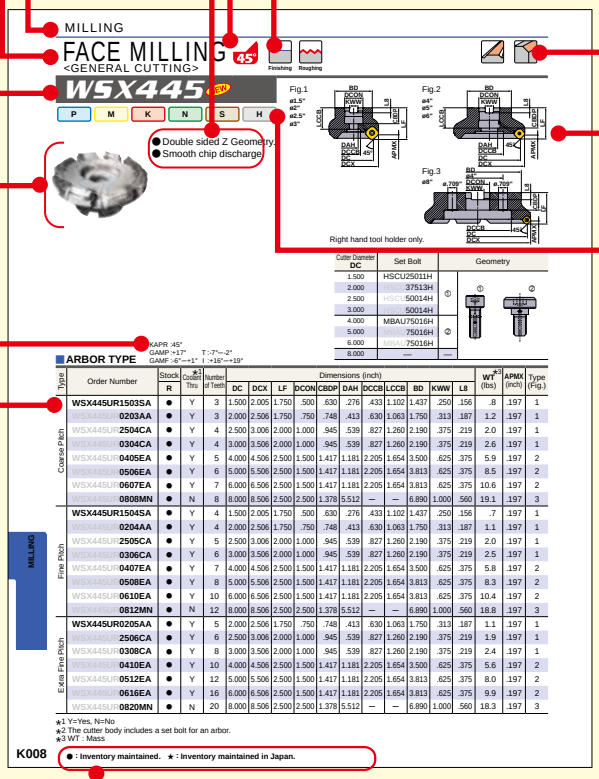
APPLICATION ICON
represents available machining applications, such as finishing and roughing.

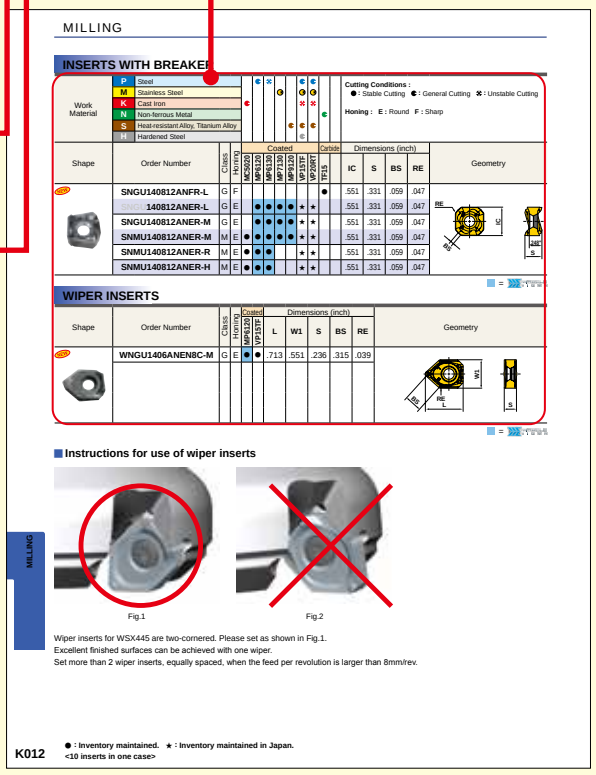
CUTTING MODE ICON
represents available cutting modes, such as face milling and shoulder milling.

GEOMETRY

SCOPE OF AVAILABLE WORK MATERIAL
provides a graph depicting the scope of the available work material for machining.

STANDARDS FOR APPLICABLE INSERTS
indicates stock status, dimensions, etc. for applicable inserts.





LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

PRODUCT STANDARDS
indicates tool types, order numbers, stock status (per right/left hand), dimensions, etc.

CUTTING EDGE ANGLE FOR FACE MILLING

●To Order: For title product, please specify order number and hand of tool (right/left).
For insert, please specify insert number and grade.

ROTATING TOOLS

MILLING TOOLS

CLASSIFICATION ····· K002

STANDARD OF MILLING

●FACE MILLING
- **WSX445** ····· K008
- **ASX445** ····· K016
- **AHX640S** ····· K024
- **AHX640W** ····· K029
- **AOX445** ····· K032

●SHOULDER MILLING
- **VOX400** ····· K033
- **ASX400** ····· K038

●DEEP SHOULDER MILLING
- **APX4000** (Long Cutting Edge) ····· K060
- **SPX** ····· K084
- **VFX5** ····· K090
- **VFX6** ····· K094
- **LER** ····· K098

●MULTI FUNCTION MILLING
- **APX3000** ····· K044
- **APX4000** ····· K052
- **AXD4000** ····· K064
- **AXD7000** ····· K074
- **BXD4000** ····· K080
- **AQX** ····· K100
- **AJX** ····· K108
- **ARX** ····· K122
- **BRP** ····· K126
- **BOE** ····· K130
- **ECMP** ····· K134

●RADIUS MILLING
- **MBD/MBF** ····· K147

●CHAMFER MILLING
- **CFSP** ····· K135

●BALL NOSE END MILL
- **SRF** ····· K136
- **MBN** ····· K146
- **SRM2** ····· K150
- **SRM2 ϕ40/ϕ50** ····· K156

●VERTICAL FEED MILLING
- **PMC** ····· K158
- **PMR** ····· K160
- **PMF** ····· K161

●SCREW-IN ARBORS ····· K162

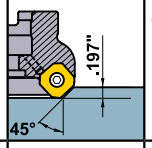
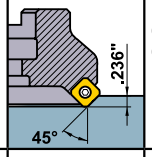
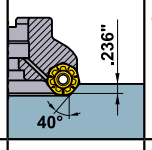
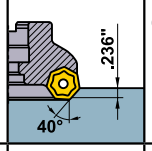
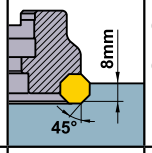
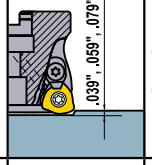
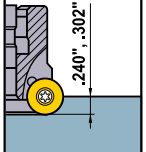
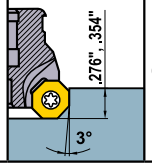
*Arranged by Alphabetical order

K024 **AHX640S**
K029 **AHX640W**
K108 **AJX**
K032 **AOX445**
K044 **APX3000**
K052 **APX4000**
K060 **APX4000** (Long Cutting Edge)
K100 **AQX**
K122 **ARX**
K038 **ASX400**
K016 **ASX445**
K064 **AXD4000**
K074 **AXD7000**
K130 **BOE**
K126 **BRP**
K080 **BXD4000**
K135 **CFSP**
K134 **ECMP**
K098 **LER**
K147 **MBD/MBF**
K146 **MBN**
K158 **PMC**
K161 **PMF**
K160 **PMR**
K162 **SCREW-IN ARBORS**
K084 **SPX**
K136 **SRF**
K150 **SRM2**
K156 **SRM2 ϕ40/ϕ50**
K090 **VFX5**
K094 **VFX6**
K033 **VOX400**
K008 **WSX445**

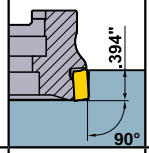
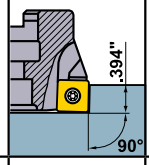
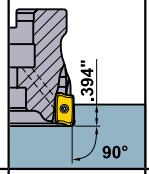
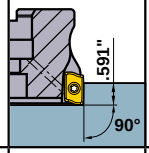
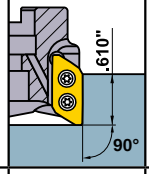
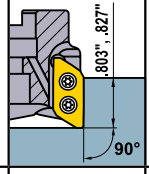
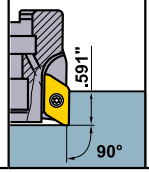
Note: Dimension symbols conforming to ISO13399. See pages PR3-PR6 for details.

CLASSIFICATION (ARBOR TYPE)

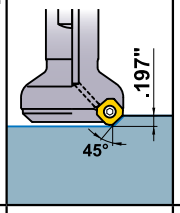
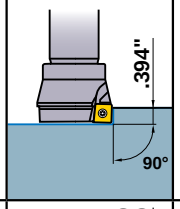
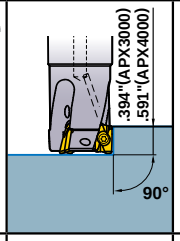
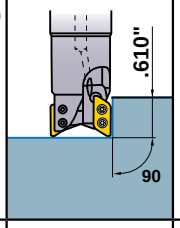
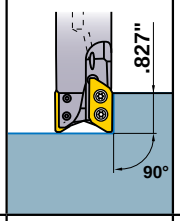
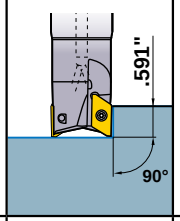
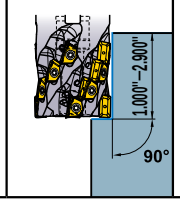
*Arranged by corner angle.

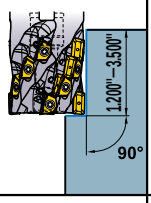
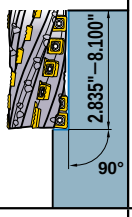
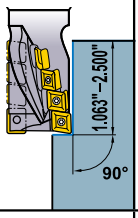
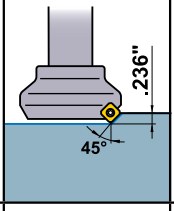
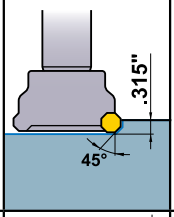
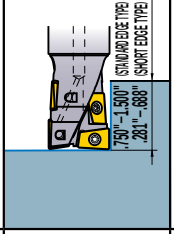
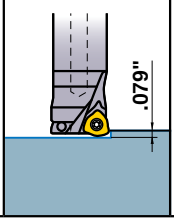
Cutting Mode	Corner Angle	Appli-cation	Product Name · Shape	Corner Angle, Max. Depth of Cut	Features	Cutter Dia.	Work Material (P M K N S H)
Face Milling	45°	General Cutting	**WSX445** MIRACLE SIGMA NEW 		●Double sided Z Geometry. ●Smooth chip discharge. ●Face mill.	·Ø1.500" ·Ø2.000" ·Ø2.500" ·Ø3.000" ·Ø4.000" ·Ø5.000" ·Ø6.000" ·Ø8.000"	**WSX445** (Max. Depth of Cut : .197") ➲ K008
	45°	General Cutting	**ASX445** MIRACLE SIGMA 		●Precision molded 20° positive insert. ●A wide range of chip breakers. ●Screw-on type. ●High rigidity due to employment of a carbide shim.	·Ø2.000" ·Ø2.500" ·Ø3.000" ·Ø4.000" ·Ø5.000" ·Ø6.000" ·Ø8.000" ·Ø10.000"	**ASX445** (Max. Depth of Cut : .236") ➲ K016
	40°	General Cutting	**AHX640S** MIRACLE SIGMA 		●Heptagonal double-sided insert. ●Economical 14 corner use. ●Fine pitch design allows high feed milling.	·Ø2.500" ·Ø3.000" ·Ø4.000" ·Ø5.000" ·Ø6.000" ·Ø8.000"	**AHX640S** (Max. Depth of Cut : .236") ➲ K024
	40°	High Feed Cutting for Cast Iron	**AHX640W** 		●Heptagonal double-sided insert. ●Economical 14 corner use. ●Fine pitch design allows high feed milling.	·Ø3.000" ·Ø4.000" ·Ø5.000" ·Ø6.000" ·Ø8.000" ·Ø10.000" ·Ø12.000"	**AHX640W** (Max. Depth of Cut : .236") ➲ K029
	45°	High Efficiency Cutting for Cast Iron	**AOX445** 		●Octagonal double-sided solid CBN insert. ●Economical 16 corner use. (when depth of cut is 3mm) ●High efficiency machining from roughing to finishing. ●Easy operation and cleaning.	·Ø63 ·Ø80 ·Ø100 ·Ø125 ·Ø160	**AOX445** (Max. Depth of Cut : 8mm) ➲ K032
	–	Multi Functional Milling	**AJX** MIRACLE SIGMA 		●15° positive insert. ●Air / coolant through. ●High rigidity due to double clamp structure. ●Suitable for high feed cutting. ●Special insert design with the use of 3 cutting edges.	·Ø2.000" ·Ø2.500" ·Ø3.000" ·Ø4.000" ·Ø4.921" ·Ø6.299"	**AJX** (Max. Depth of Cut : .039", .059", .079") ➲ K109
	–	Multi Functional Milling	**BRP** 		●11° positive insert. ●Round shape insert gives strong cutting edge. ●A wide variety of lengths available. ●Suitable for machining of die and mold.	·Ø1.500" ·Ø2.000" ·Ø2.500" ·Ø3.000" ·Ø4.000"	**BRP** (Max. Depth of Cut : .240", .302") ➲ K127
	–	Multi Functional Milling	**BOE** 		●20° positive insert. ●Compatible with 8-corner use insert and round type insert. ●Multi functional milling.	·Ø1.250" ·Ø1.500" ·Ø2.000" ·Ø2.480" ·Ø2.500" ·Ø3.000" ·Ø3.150" ·Ø3.937" ·Ø4.921" ·Ø6.300" ·Ø8.000"	**BOE** (Max. Depth of Cut : .276", .354") ➲ K131

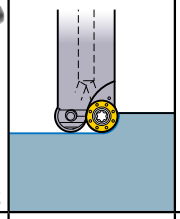
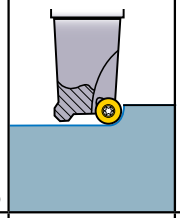
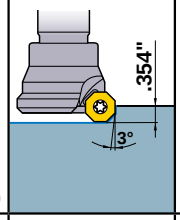
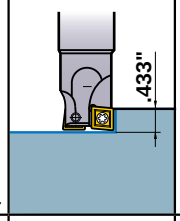
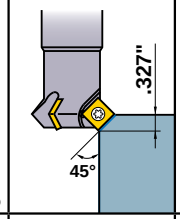
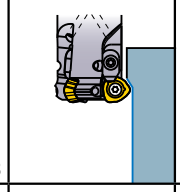
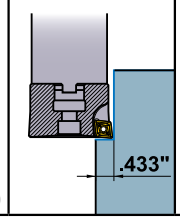
✱**Arranged by No. of available corners.**

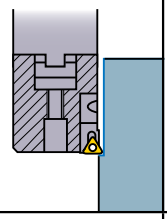
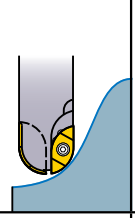
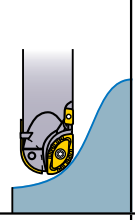
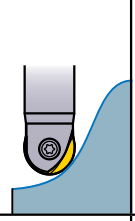
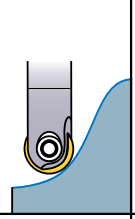
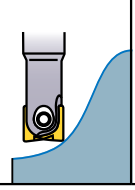
Cutting Mode	Corner Angle	Appli-cation	Product Name · Shape	Corner Angle, Max. Depth of Cut	Features	Cutter Dia.	Work Material: P	M	K	N	S	H
Shoulder Milling	0°	For Cast Iron	**VOX400** 		●Vertical inserts with high strength cutting edge. ●Economical 8 corner use. ●Screw-on type.	·Ø2.000" ·Ø2.500" ·Ø3.000" ·Ø4.000" ·Ø5.000" ·Ø6.000" ·Ø8.000" ·Ø10.000"				VOX400 (Max. Depth of Cut : .394") ➲ K033		
	0°	General Cutting	**ASX400** MIRACLE SIGMA 		●Economical due to the use of 4 cutting edges. ●Low resistance due to the 3D design of the curved cutting edge. ●Curved cutting edge and high rigidity holder.	·Ø2.000" ·Ø2.500" ·Ø3.000" ·Ø4.000" ·Ø5.000" ·Ø6.000" ·Ø8.000" ·Ø10.000"				ASX400 (Max. Depth of Cut : .394") ➲ K038		
	0°	Multi Functional Milling	**APX3000** MIRACLE SIGMA 		●Air / coolant through. ●Low resistance insert and high rigidity body. ●Ideal chip control. ●High wall accuracy can be produced by using this cutter and unique insert geometry.	·Ø2.000" ·Ø2.500" ·Ø3.000"				APX3000 (Max. Depth of Cut : .394") ➲ K045		
	0°	Multi Functional Milling	**APX4000** MIRACLE SIGMA 		●Air / coolant through. ●Low resistance insert and high rigidity body. ●Ideal chip control. ●High wall accuracy can be produced by using this cutter and unique insert geometry.	·Ø2.000" ·Ø2.500" ·Ø3.000" ·Ø4.000"				APX4000 (Max. Depth of Cut : .591") ➲ K053		
	0°	Multi Functional Milling	**AXD4000** MIRACLE SIGMA 		●Air / coolant through. ●Low resistance inserts. ●High balance quality. ●Excellent wall accuracy. ●Multi functional milling.	·Ø1.500" ·Ø2.000" ·Ø2.500" ·Ø3.000" ·Ø4.000" ·Ø5.000"				AXD4000 (Max. Depth of Cut : .610") ➲ K065		
	0°	Multi Functional Milling	**AXD7000** 		●Air / coolant through. ●Low resistance inserts. ●High balance quality. ●Excellent wall accuracy. ●Multi functional milling.	·Ø2.000" ·Ø3.000"				AXD7000 (Max. Depth of Cut : .803", .827") ➲ K074		
	0°	Aluminum Alloy for Difficult-to-cut Material Cutting	**BXD4000** 		●Air / coolant through. ●Low resistance inserts & high rigidity body. ●The Anti Fly Insert mechanism guarantees secure high-revolution milling.	·Ø1.500" ·Ø2.000" ·Ø2.500" ·Ø3.000" ·Ø4.000"				BXD4000 (Max. Depth of Cut : .591") ➲ K081		

CLASSIFICATION (SHANK TYPE)

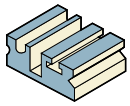
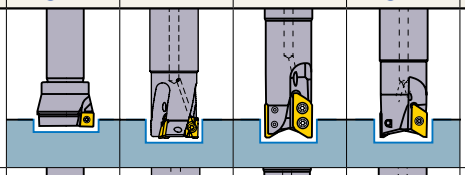
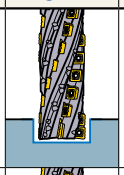
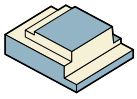
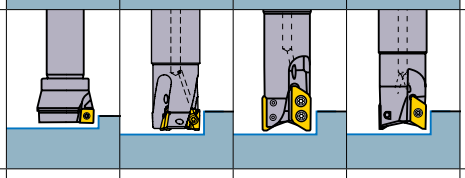
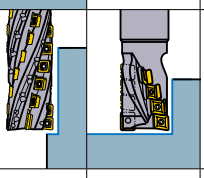
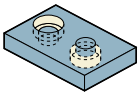
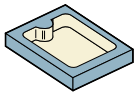
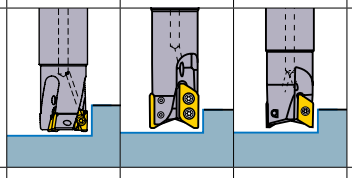
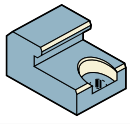
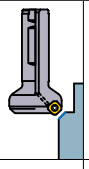
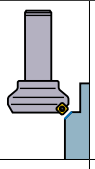
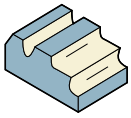
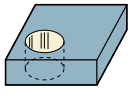
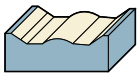
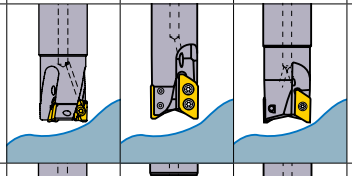
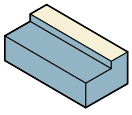
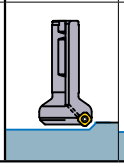
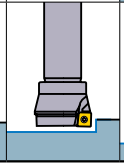
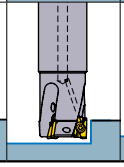
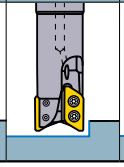
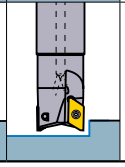
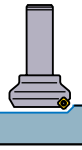
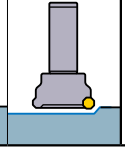
Product Name · Shape	Corner Angle, Max. Depth of Cut	Features
WSX445 NEW  K011		● Double sided Z Geometry. ● Smooth chip discharge. **ϕ1.500"—ϕ2.000"** **ϕ63—ϕ80mm** ● End mill style.
ASX400  K039		● Economical due to the use of 4 cutting edges. ● Low resistance due to the 3D design of the curved cutting edge. ● Curved cutting edge and high rigidity holder. ● Max. depth of cut .394". **ϕ1.250"—ϕ2.000"**
APX3000 **APX4000**  K044 K052		● Air / coolant through. ● Low resistance insert and high rigidity body. ● Ideal chip control. ● High wall accuracy can be produced by using this cutter and unique insert geometry. **ϕ.500"—ϕ1.500"**
AXD4000  K064		● Air / coolant through. ● Low resistance inserts. ● High balance quality. ● Excellent wall accuracy. ● Multi functional milling. **ϕ1.000"—ϕ1.500"**
AXD7000  K074		● Air / coolant through. ● Low resistance inserts. ● High balance quality. ● Excellent wall accuracy. ● Multi functional milling. **ϕ1.250"—ϕ1.500"**
BXD4000  K080		● Air / coolant through. ● Low resistance inserts & high rigidity body. ● The Anti Fly Insert mechanism guarantees secure high-revolution milling. **ϕ1.000"—ϕ1.500"**
VFX5  K090		● Vertical inserts with high strength cutting edge. ● Screw-on type clamping. ● High efficiency milling of titanium alloys. **ϕ2.000"—ϕ3.000"**

Product Name · Shape	Corner Angle, Max. Depth of Cut	Features
VFX6  K094		● Vertical inserts with high strength cutting edge. ● Screw-on type clamping. ● High efficiency milling of titanium alloys. **ϕ2.000"—ϕ4.000"**
SPX  K084		● The wavy cutting edge helps to reduce cutting resistance. ● Suitable for heavy machining due to holder rigidity. **ϕ1.969"—ϕ2.000"**
LER  K098		● Different helical flute angles prevents chattering. ● Suitable for heavy cutting due to holder rigidity. **ϕ1.000"—ϕ2.000"**
ASX445  K017		● Precision molded 20° positive insert. ● A wide range of chip breakers. ● Screw-on type. ● High rigidity due to employment of a carbide shim. **ϕ50—ϕ80mm**
AOX445  K032		● Octagonal double-sided solid CBN insert. ● Economical 16 corner use. (when depth of cut is 3mm) ● High efficiency machining from roughing to finishing. ● Easy operation and cleansing. **ϕ50—ϕ63mm**
AQX  K100		● Air / coolant through. ● The center bottom cutting edge enables drilling and end milling without prepared hole. ● Max.depth of cut .281"—1.500". **ϕ.625"—ϕ1.500"**
AJX  K108		● 13°, 15° positive insert. ● Air / coolant through. ● High rigidity due to double clamp structure. ● Suitable for high feed cutting. ● Special insert design with the use of 3 cutting edges. **ϕ.625"—ϕ2.000"**

Product Name · Shape	Corner Angle, Max. Depth of Cut	Features
ARX  ➔ K122		● Precision M-class 15°positive insert. ● Effective for various machining applications. ● Air / coolant through. **ϕ10—ϕ25mm**
BRP  ➔ K126		● 11° positive insert. ● Round shape insert gives strong cutting edge. ● A wide variety of lengths available. ● Suitable for machining of die and mold. ● Max.depth of cut .146"—.302". **ϕ.500"—ϕ2.500"**
BOE  ➔ K130		● 20°positive insert. ● Compatible with 8-corner use insert and round type insert. ● Multi functional milling. **ϕ1.250"—ϕ3.125"**
ECMP  ➔ K134		● Unique insert seat position facilitates smooth initial cutting and stable machining. ● Excellent chip disposal. ● 86°rhombic shape 11°positive insert. **ϕ1.000"—ϕ1.500"**
CFSP  ➔ K135		● Excellent sharpness with 11°positive inserts. ● 45°chamfer series. **ϕ.313"—ϕ1.250"**
PMC  ➔ K158		● For undercutting trimmed part of press mould. ● 2 directional cutting with large overhang. **ϕ25—ϕ40mm**
PMR  ➔ K160		● 1 directional cutting with large overhang. ● Unique shape of curved edge gives high rigidity and low resistance. **ϕ50—ϕ80mm**

Product Name · Shape	Corner Angle, Max. Depth of Cut	Features
PMF  ➔ K161		● 2 directional cutting with large overhang. ● No burring so no need for hand finishing. ● High precision multi directional insert ensures highly accurate surfaces. **ϕ50—ϕ80mm**
SRM2  ➔ K150		● Air / coolant through. ● Suitable for roughing to semi-finishing of small and medium molds. ● High rigidity body design. ● Low resistance chipbreaker. ● Key type clamp. ● Shrink fit ready. **ϕ.625"—ϕ1.250"**
SRM2 ϕ40/ϕ50 (ϕ1.575"/ϕ1.969")  ➔ K156		● Best for roughing of molds. ● Low resistance chipbreaker. ● Highly rigid body. **ϕ40, ϕ50 mm (ϕ1.575", ϕ1.969")**
SRF MIRACLE SIGMA  ➔ K136		● S-shaped cutting edge provides sharpness similar to that of solid ball nose end mills. ● Highly accurate corner radius tolerance allows for high precision finishing. ● Carbide shank type available. **ϕ.375"—ϕ1.250"**
MBN  ➔ K146		● Insert with two edges. ● Simple clamp system with one clamp screw. ● Sharp cutting edge. **ϕ.312"—ϕ1.250"**
MBD  ➔ K147		● Insert with two edges. ● Simple clamp system with one clamp screw. ● Sharp cutting edge. **ϕ.500"—ϕ1.000"**

SELECTION CHART (SHANK TYPE)

Product Name / Cutting Mode	WSX445 NEW	ASX400	APX3000 APX4000	AXD4000 AXD7000	BXD4000	VFX5 VFX6	SPX	LER	ASX445	AOX445
										
	➲ K011	➲ K039	➲ K044 K052	➲ K064 K074	➲ K080	➲ K090 K094	➲ K084	➲ K098	➲ K017	➲ K032
Slot Milling 										
Shoulder Milling 										
Spot Milling 										
Contour Milling 										
Chamfer Milling 										
Radius Milling 										
Drilling 										
Copy Milling 										
Face Milling 										

AQX MULTI FUNCTIONAL TYPE	AJX MULTI FUNCTIONAL TYPE	ARX MULTI FUNCTIONAL TYPE	BRP MULTI FUNCTIONAL TYPE	BOE MULTI FUNCTIONAL TYPE	ECMP	CFSP	PMC PMR PMF	SRM2	SRF MBN MBD
									
➲ K100	➲ K108	➲ K122	➲ K126	➲ K130	➲ K134	➲ K135	➲ K158 K160 K161	➲ K150 K156	➲ K136 K146 K147

FACE MILLING <GENERAL CUTTING>

45° Finishing Roughing

WSX445 NEW

P M K N S H



- Double sided Z Geometry.
- Smooth chip discharge.

Fig.1

ø1.5" ø2" ø2.5" ø3"

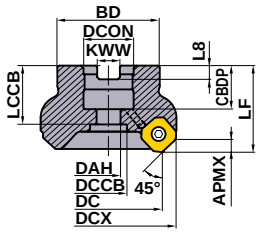


Fig.2

ø4" ø5" ø6"

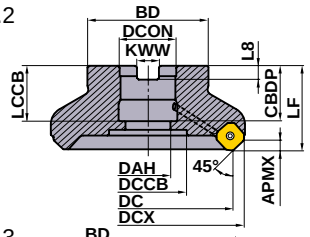
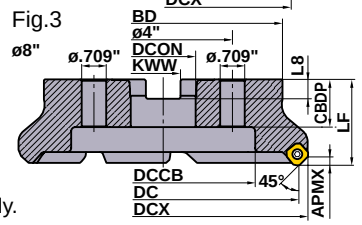


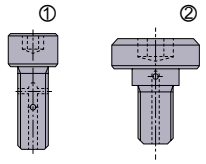
Fig.3

ø8"



Right hand tool holder only.

Cutter Diameter DC	Set Bolt	Geometry
1.500	HSCU25011H	①
2.000	HSCU37513H	
2.500	HSCU50014H	
3.000	HSCU50014H	
4.000	MBAU75016H	②
5.000	MBAU75016H	
6.000	MBAU75016H	
8.000	—	—



KAPR :45°
GAMP :+17° T :-7°—-2°
GAMF :-6°—+1° I :+16°—+19°

ARBOR TYPE

Type	Order Number	Stock R	Coolant Thru ★1	Number of Teeth	Dimensions (inch) DC	DCX	LF	DCON	CBDP	DAH	DCCB	LCCB	BD	KWW	L8	WT ★3 (lbs)	APMX (inch)	Type (Fig.)
Coarse Pitch	WSX445UR1503SA	●	Y	3	1.500	2.005	1.750	.500	.630	.276	.433	1.102	1.437	.250	.156	.8	.197	1
	WSX445UR0203AA	●	Y	3	2.000	2.506	1.750	.750	.748	.413	.630	1.063	1.750	.313	.187	1.2	.197	1
	WSX445UR2504CA	●	Y	4	2.500	3.006	2.000	1.000	.945	.539	.827	1.260	2.190	.375	.219	2.0	.197	1
	WSX445UR0304CA	●	Y	4	3.000	3.506	2.000	1.000	.945	.539	.827	1.260	2.190	.375	.219	2.6	.197	1
	WSX445UR0405EA	●	Y	5	4.000	4.506	2.500	1.500	1.417	1.181	2.205	1.654	3.500	.625	.375	5.9	.197	2
	WSX445UR0506EA	●	Y	6	5.000	5.506	2.500	1.500	1.417	1.181	2.205	1.654	3.813	.625	.375	8.5	.197	2
	WSX445UR0607EA	●	Y	7	6.000	6.506	2.500	1.500	1.417	1.181	2.205	1.654	3.813	.625	.375	10.6	.197	2
	WSX445UR0808MN	●	N	8	8.000	8.506	2.500	2.500	1.378	5.512	—	—	6.890	1.000	.560	19.1	.197	3
Fine Pitch	WSX445UR1504SA	●	Y	4	1.500	2.005	1.750	.500	.630	.276	.433	1.102	1.437	.250	.156	.7	.197	1
	WSX445UR0204AA	●	Y	4	2.000	2.506	1.750	.750	.748	.413	.630	1.063	1.750	.313	.187	1.1	.197	1
	WSX445UR2505CA	●	Y	5	2.500	3.006	2.000	1.000	.945	.539	.827	1.260	2.190	.375	.219	2.0	.197	1
	WSX445UR0306CA	●	Y	6	3.000	3.506	2.000	1.000	.945	.539	.827	1.260	2.190	.375	.219	2.5	.197	1
	WSX445UR0407EA	●	Y	7	4.000	4.506	2.500	1.500	1.417	1.181	2.205	1.654	3.500	.625	.375	5.8	.197	2
	WSX445UR0508EA	●	Y	8	5.000	5.506	2.500	1.500	1.417	1.181	2.205	1.654	3.813	.625	.375	8.3	.197	2
	WSX445UR0610EA	●	Y	10	6.000	6.506	2.500	1.500	1.417	1.181	2.205	1.654	3.813	.625	.375	10.4	.197	2
	WSX445UR0812MN	●	N	12	8.000	8.506	2.500	2.500	1.378	5.512	—	—	6.890	1.000	.560	18.8	.197	3
Extra Fine Pitch	WSX445UR0205AA	●	Y	5	2.000	2.506	1.750	.750	.748	.413	.630	1.063	1.750	.313	.187	1.1	.197	1
	WSX445UR2506CA	●	Y	6	2.500	3.006	2.000	1.000	.945	.539	.827	1.260	2.190	.375	.219	1.9	.197	1
	WSX445UR0308CA	●	Y	8	3.000	3.506	2.000	1.000	.945	.539	.827	1.260	2.190	.375	.219	2.4	.197	1
	WSX445UR0410EA	●	Y	10	4.000	4.506	2.500	1.500	1.417	1.181	2.205	1.654	3.500	.625	.375	5.6	.197	2
	WSX445UR0512EA	●	Y	12	5.000	5.506	2.500	1.500	1.417	1.181	2.205	1.654	3.813	.625	.375	8.0	.197	2
	WSX445UR0616EA	●	Y	16	6.000	6.506	2.500	1.500	1.417	1.181	2.205	1.654	3.813	.625	.375	9.9	.197	2
	WSX445UR0820MN	●	N	20	8.000	8.506	2.500	2.500	1.378	5.512	—	—	6.890	1.000	.560	18.3	.197	3

★1 Y=Yes, N=No
★2 The cutter body includes a set bolt for an arbor.
★3 WT : Mass

● : Inventory maintained. ★ : Inventory maintained in Japan.



METRIC Standard

For inch arbors

Fig.1
ø80

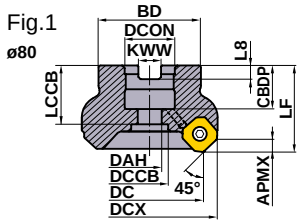


Fig.2
ø100
ø125
ø160

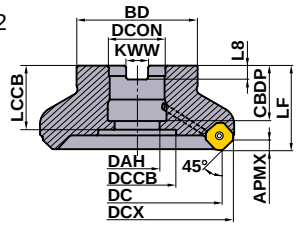
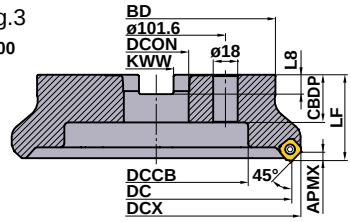
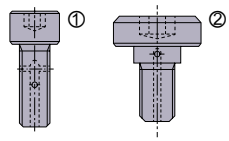


Fig.3
ø200



Right hand tool holder only.

Cutter Diameter DC	Set Bolt	Geometry
ϕ80	HSC12035H	①
ϕ100	MBA16033H	
ϕ125	MBA20040H	②
ϕ160	MBA24045H	
ϕ200	—	



KAPR :45°
GAMP :+17° T :-7°—-2°
GAMF :-6°—+1° I :+16°—+19°

ARBOR TYPE

Type	Order Number	Stock R	Coolant Thru ★1	Number of Teeth	Dimensions (mm) DC	DCX	LF	DCON	CBDP	DAH	DCCB	LCCB	BD	KWW	L8	WT ★3 (kg)	APMX (mm)	Type (Fig.)
Coarse Pitch	**WSX445R08004CA**	★	Y	4	80	92.9	50	25.4 [1.0"]	26	13	20	34	56	9.5	6	1.27	5	1
	WSX445R**10005DA**	★	Y	5	100	112.9	50	31.75 [1.25"]	32	26	45	37	70	12.7	8	1.78	5	2
	WSX445R**12506EA**	★	Y	6	125	137.9	63	38.1 [1.5"]	36	30	56	42	80	15.9	10	3.2	5	2
	WSX445R**16007FA**	★	Y	7	160	172.9	63	50.8 [2.0"]	38	40	72	45	100	19.1	11	4.93	5	2
	WSX445R**20008KN**	★	N	8	200	212.9	63	47.625 [1.85"]	35	—	135	—	175	25.4	14.22	8.73	5	3
Fine Pitch	**WSX445R08006CA**	★	Y	6	80	92.9	50	25.4 [1.0"]	26	13	20	34	56	9.5	6	1.21	5	1
	WSX445R**10007DA**	★	Y	7	100	112.9	50	31.75 [1.25"]	32	26	45	37	70	12.7	8	1.72	5	2
	WSX445R**12508EA**	★	Y	8	125	137.9	63	38.1 [1.5"]	36	30	56	42	80	15.9	10	3.13	5	2
	WSX445R**16010FA**	★	Y	10	160	172.9	63	50.8 [2.0"]	38	40	72	45	100	19.1	11	4.83	5	2
	WSX445R**20012KN**	★	N	12	200	212.9	63	47.625 [1.85"]	35	—	135	—	175	25.4	14.22	8.6	5	3
Extra Fine Pitch	**WSX445R08008CA**	★	Y	8	80	92.9	50	25.4 [1.0"]	26	13	20	34	56	9.5	6	1.14	5	1
	WSX445R**10010DA**	★	Y	10	100	112.9	50	31.75 [1.25"]	32	26	45	37	70	12.7	8	1.62	5	2
	WSX445R**12512EA**	★	Y	12	125	137.9	63	38.1 [1.5"]	36	30	56	42	80	15.9	10	3	5	2
	WSX445R**16016FA**	★	Y	16	160	172.8	63	50.8 [2.0"]	38	40	72	45	100	19.1	11	4.64	5	2
	WSX445R**20020KN**	★	N	20	200	212.8	63	47.625 [1.85"]	35	—	135	—	175	25.4	14.22	8.37	5	3

★1 Y=Yes, N=No
★2 Set bolt not included.
★3 WT : Mass

INSERTS ➤ K012
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



METRIC Standard

For metric arbors

Fig.1

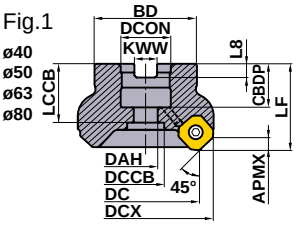


Fig.2

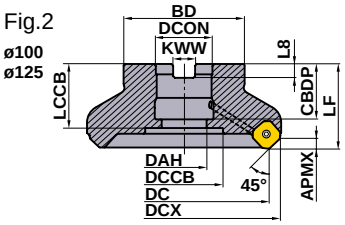


Fig.3

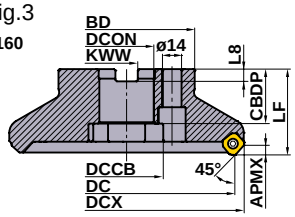
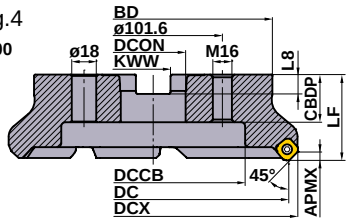
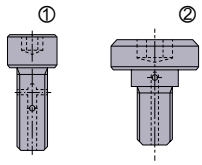


Fig.4



Right hand tool holder only.

Cutter Diameter DC	Set Bolt	Geometry
ϕ40	HSC08025H	①
ϕ50	HSC10030H	
ϕ63	HSC10030H	
ϕ80	HSC12035H	
ϕ100	MBA16033H	②
ϕ125	MBA20040H	
ϕ160	MBA20040H	
ϕ200	—	



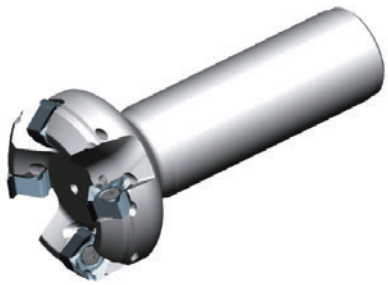
KAPR :45°
GAMP :+17° T :-7°—-2°
GAMF :-6°—+1° I :+16°—+19°

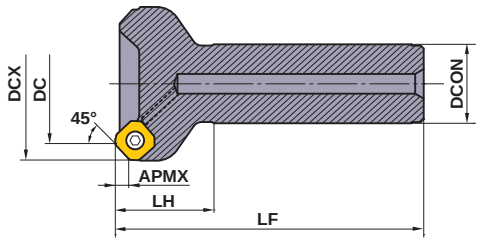
ARBOR TYPE

Type	Order Number	Stock R	Coolant Thru ★1	Number of Teeth	Dimensions (mm) DC	DCX	LF	DCON	CBDP	DAH	DCCB	LCCB	BD	KWW	L8	WT ★3 (kg)	APMX (mm)	Type (Fig.)
Coarse Pitch	**WSX445-040A03AR**	★	Y	3	40	52.8	40	16	18	9	14	25	37	8.4	5.6	0.31	5	1
	WSX445-050A03AR	★	Y	3	50	62.9	40	22	20	11	17	27	47	10.4	6.3	0.47	5	1
	WSX445-063A04AR	★	Y	4	63	75.9	40	22	20	11	17	27	50	10.4	6.3	0.64	5	1
	WSX445-080A04AR	★	Y	4	80	92.9	50	27	23	13	20	34	56	12.4	7	1.26	5	1
	WSX445-100B05AR	★	Y	5	100	112.9	50	32	26	26	45	32	78	14.4	8	1.93	5	2
	WSX445-125B06AR	★	Y	6	125	137.9	63	40	28	30	56	40	89	16.4	9	3.43	5	2
	WSX445-160C07NR	★	N	7	160	172.9	63	40	40	—	56	—	100	16.4	9	4.91	5	3
	WSX445-200C08NR	★	N	8	200	212.9	63	60	32	—	135	—	160	25.7	14.22	7.54	5	4
Fine Pitch	**WSX445-040A04AR**	★	Y	4	40	52.8	40	16	18	9	14	25	37	8.4	5.6	0.28	5	1
	WSX445-050A04AR	★	Y	4	50	62.9	40	22	20	11	17	27	47	10.4	6.3	0.44	5	1
	WSX445-063A05AR	★	Y	5	63	75.9	40	22	20	11	17	27	50	10.4	6.3	0.61	5	1
	WSX445-080A06AR	★	Y	6	80	92.9	50	27	23	13	20	34	56	12.4	7	1.2	5	1
	WSX445-100B07AR	★	Y	7	100	112.9	50	32	26	26	45	32	78	14.4	8	1.87	5	2
	WSX445-125B08AR	★	Y	8	125	137.9	63	40	28	30	56	40	89	16.4	9	3.36	5	2
	WSX445-160C10NR	★	N	10	160	172.9	63	40	40	—	56	—	100	16.4	9	4.81	5	3
	WSX445-200C12NR	★	N	12	200	212.9	63	60	32	—	135	—	160	25.7	14.22	7.41	5	4
Extra Fine Pitch	**WSX445-050A05AR**	★	Y	5	50	62.9	40	22	20	11	17	27	47	10.4	6.3	0.41	5	1
	WSX445-063A06AR	★	Y	6	63	75.9	40	22	20	11	17	27	50	10.4	6.3	0.58	5	1
	WSX445-080A08AR	★	Y	8	80	92.9	50	27	23	13	20	34	56	12.4	7	1.14	5	1
	WSX445-100B10AR	★	Y	10	100	112.9	50	32	26	26	45	32	78	14.4	8	1.77	5	2
	WSX445-125B12AR	★	Y	12	125	137.9	63	40	28	30	56	40	89	16.4	9	3.22	5	2
	WSX445-160C16NR	★	N	16	160	172.8	63	40	40	—	56	—	100	16.4	9	4.64	5	3
	WSX445-200C20NR	★	N	20	200	212.8	63	60	32	—	135	—	160	25.7	14.22	7.17	5	4

★1 Y=Yes, N=No
★2 Set bolt not included.
★3 WT : Mass

● : Inventory maintained. ★ : Inventory maintained in Japan.





Right hand tool holder only.

SHANK TYPE

Type	Order Number	Stock R	Coolant Thru *1	Number of Teeth	Dimensions (inch) DC	DCX	LF	DCON	LH	WT (lbs) *2	APMX (inch)
Coarse Pitch	WSX445UR2403FA20M	●	Y	3	1.500	2.005	4.750	1.250	1.500	1.698	.197
	WSX445UR3203FA20M	●	Y	3	2.000	2.506	4.750	1.250	1.500	2.050	.197
Fine Pitch	WSX445UR2404FA20M	●	Y	4	1.500	2.005	4.750	1.250	1.500	1.631	.197
	WSX445UR3204FA20M	●	Y	4	2.000	2.506	4.750	1.250	1.500	1.984	.197

*1 Y=Yes, N=No
*2 WT : Mass

METRIC Standard

STRAIGHT SHANK TYPE

Type	Order Number	Stock R	Coolant Thru *1	Number of Teeth	Dimensions (mm) DC	DCX	LF	DCON	LH	WT (kg) *2	APMX (mm)
Coarse Pitch	WSX445R4003SA32M	★	Y	3	40	52.8	125	32	40	0.84	5
	WSX445R5003SA32M	★	Y	3	50	62.9	125	32	40	0.98	5
	NEW WSX445R6304SA32M	★	Y	4	63	75.9	125	32	40	1.18	5
	NEW WSX445R8004SA32M	★	Y	4	80	92.9	125	32	40	1.51	5
Fine Pitch	WSX445R4004SA32M	★	Y	4	40	52.8	125	32	40	0.81	5
	WSX445R5004SA32M	★	Y	4	50	62.9	125	32	40	0.95	5
	NEW WSX445R6305SA32M	★	Y	5	63	75.9	125	32	40	1.15	5
	NEW WSX445R8006SA32M	★	Y	6	80	92.9	125	32	40	1.45	5

*1 Y=Yes, N=No
*2 WT : Mass

SPARE PARTS

Tool Holder Number	 * Clamp Screw	 Wrench (Insert)
WSX445	TPS4R	TIP15W

* Clamp Torque (lbf-in) : TPS4R=31

MILLING

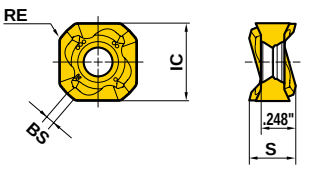
INSERTS ➤ K012
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS WITH BREAKER

Work Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metal
	S	Heat-resistant Alloy, Titanium Alloy
	H	Hardened Steel

Cutting Conditions :
● : Stable Cutting ◔ : General Cutting ✱ : Unstable Cutting

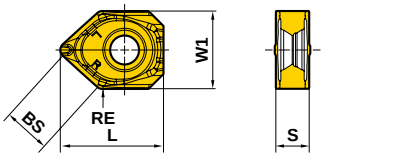
Honing : **E :** Round **F :** Sharp

Shape	Order Number	Class	Honing	Coated							Carbide		Dimensions (inch)				Geometry
				MC5020	MP6120	MP6130	MP7130	MP9120	VP15TF	VP20RT	TF15		IC	S	BS	RE	
NEW	SNGU140812ANFR-L	G	F								●		.551	.331	.059	.047	
	SNGU140812ANER-L	G	E		●	●	●	●	★	★			.551	.331	.059	.047	
	SNGU140812ANER-M	G	E		●	●	●	●	★	★			.551	.331	.059	.047	
	SNMU140812ANER-M	M	E	●	●	●	●	●	★	★			.551	.331	.059	.047	
	SNMU140812ANER-R	M	E	●	●	●			★	★			.551	.331	.059	.047	
	SNMU140812ANER-H	M	E	●	●	●			★	★			.551	.331	.059	.047	



= MIRACLE SIGMA

WIPER INSERTS

Shape	Order Number	Class	Honing	Coated		Dimensions (inch)					Geometry
				MP6120	VP15TF	L	W1	S	BS	RE	
NEW	WNGU1406ANEN8C-M	G	E	●	●	.713	.551	.236	.315	.039	



= MIRACLE SIGMA

Instructions for use of wiper inserts



Fig.1



Fig.2

Wiper inserts for WSX445 are two-cornered. Please set as shown in Fig.1.
Excellent finished surfaces can be achieved with one wiper.
Set more than 2 wiper inserts, equally spaced, when the feed per revolution is larger than 8mm/rev.

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

RECOMMENDED CUTTING CONDITIONS

Dry cutting condition

	Work Material	Hardness	Grade	vc (SFM)	Finish—Light Cutting		Light—Rough Cutting		Medium—Heavy Cutting	
					fz (IPT)	ap (inch)	fz (IPT)	ap (inch)	fz (IPT)	ap (inch)
P	Mild Steel	≤180HB	**MP6120 VP15TF**	820 (655—985)	.006 (.004—.008)	.118	.008 (.006—.010)	.158	.010 (.008—.012)	.197
			MP6130 VP20RT	785 (620—950)	.006 (.004—.008)	.118	.008 (.006—.010)	.158	.010(.008—.012)	.197
	Carbon Steel Alloy Steel	180—350HB	**MP6120 VP15TF**	720 (560—885)	.006 (.004—.008)	.118	.008 (.006—.010)	.158	.010 (.008—.012)	.197
			MP6130 VP20RT	655 (490—820)	.006 (.004—.008)	.118	.008 (.006—.010)	.158	.010 (.008—.012)	.197
	Alloy Steel Pre-Hardened Steel	35—45HRC	**MP6120 VP15TF**	460 (330—590)	.006 (.004—.008)	.079	.008 (.006—.010)	.158	.010 (.008—.012)	.197
			MP6130 VP20RT	395 (295—490)	.006 (.004—.008)	.079	.008 (.006—.010)	.158	.010 (.008—.012)	.197
M	Austenitic Stainless Steel Ferritic and Martensitic Stainless Steel	—	**MP7130 VP15TF VP20RT**	655 (490—820)	.006 (.004—.008)	.079	.008 (.006—.010)	.118	—	—
	Austenitic Stainless Steel	>200HB	**MP7130 VP15TF VP20RT**	560 (395—720)	.006 (.004—.008)	.079	.008 (.006—.010)	.118	—	—
	Two-phase Stainless Steel	≤280MPa	**MP7130 VP15TF VP20RT**	525 (360—690)	.006 (.004—.008)	.079	.008 (.006—.010)	.118	—	—
	Hardened Stainless Steel	<450HB	**MP7130 VP15TF VP20RT**	490 (330—655)	.006 (.004—.008)	.079	.008 (.006—.010)	.118	—	—
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	720 (655—885)	.006 (.004—.008)	.118	.008 (.006—.010)	.158	.010 (.008—.012)	.197
			VP15TF VP20RT	590 (425—820)	.006 (.004—.008)	.118	.008 (.006—.010)	.158	.010 (.008—.012)	.197
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MC5020**	655 (590—820)	.006 (.004—.008)	.118	.008 (.006—.010)	.158	.010 (.008—.012)	.197
			VP15TF VP20RT	525 (360—785)	.006 (.004—.008)	.118	.008 (.006—.010)	.158	.010 (.008—.012)	.197
H	Hardened Steel	40—55HRC	**VP15TF**	165 (100—230)	.002 (.002—.004)	.059	.004 (.002—.006)	.079	—	—

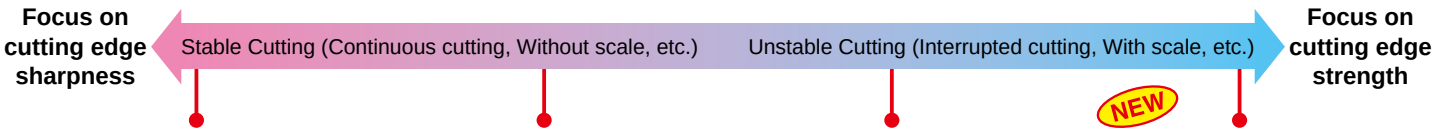
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Wet cutting condition

	Work Material	Hardness	Grade	vc (SFM)	Finish—Light Cutting		Light—Rough Cutting		Medium—Heavy Cutting	
					fz (IPT)	ap (inch)	fz (IPT)	ap (inch)	fz (IPT)	ap (inch)
P	Mild Steel	≤180HB	MP6120 VP15TF	490 (330—655)	.006 (.004—.008)	.118	.008 (.006—.010)	.158	.010 (.008—.012)	.197
			MP6130 VP20RT							
	Carbon Steel Alloy Steel	180—350HB	MP6120 VP15TF	395 (260—525)	.006 (.004—.008)	.118	.008 (.006—.010)	.158	.010 (.008—.012)	.197
			MP6130 VP20RT							
	Alloy Steel Pre-Hardened Steel	35—45HRC	MP6120 VP15TF	330 (260—395)	.006 (.004—.008)	.079	.008 (.006—.010)	.158	.010 (.008—.012)	.197
			MP6130 VP20RT							
M	Austenitic Stainless Steel Ferritic and Martensitic Stainless Steel	—	MP7130 VP15TF VP20RT	425 (260—590)	.006 (.004—.008)	.079	.008 (.006—.010)	.079	—	—
	Austenitic Stainless Steel	>200HB	MP7130 VP15TF VP20RT	330 (260—490)	.006 (.004—.008)	.079	.008 (.006—.010)	.118	—	—
	Two-phase Stainless Steel	≤280MPa	MP7130 VP15TF VP20RT	330 (260—490)	.006 (.004—.008)	.079	.008 (.006—.010)	.118	—	—
	Hardened Stainless Steel	<450HB	MP7130 VP15TF VP20RT	295 (165—460)	.006 (.004—.008)	.079	.008 (.006—.010)	.118	—	—
K	Gray Cast Iron	Tensile Strength ≤350MPa	MC5020	590 (525—655)	.006 (.004—.008)	.118	.008 (.006—.010)	.158	.010 (.008—.012)	.197
			VP15TF VP20RT	425 (330—525)	.006 (.004—.008)	.118	.008 (.006—.010)	.158	.010 (.008—.012)	.197
	Ductile Cast Iron	Tensile Strength ≤800MPa	MC5020	590 (525—655)	.006 (.004—.008)	.118	.008 (.006—.010)	.158	.010 (.008—.012)	.197
			VP15TF VP20RT	360 (260—460)	.006 (.004—.008)	.118	.008 (.006—.010)	.158	.010 (.008—.012)	.197
N	Aluminum Alloy	—	TF15	1640 (655-3280)	.008 (.004—.012)	.197	—	—	—	—
S	Titanium Alloy	—	MP9120 VP15TF VP20RT	165 (130—195)	.002 (.002—.004)	.059	.004 (.002—.006)	.079	—	—
	Heat Resistant Alloy	—	MP9120 VP15TF VP20RT	130 (65—165)	.002 (.002—.004)	.059	.004 (.002—.006)	.079	—	—
H	Hardened Steel	40—55HRC	VP15TF	165 (100—230)	.002 (.002—.004)	.059	.004 (.002—.006)	.079	—	—

BREAKER SYSTEM

Breaker series for varied cutting condition.



Lbreaker

The high rake angle boosts cutting performance. Positive land retains strength and provides low cutting resistance.

Mbreaker

First recommendation for general applications. A good balance of edge strength and sharpness is provided by the optimized positive land and rake angle.

Rbreaker

For unstable applications. Enhanced edge strength and retention of sharpness is provided by the negative land and positive rake angle respectively.

Hbreaker

For demanding applications. A stronger land and reduced positive rake angle provides maximum edge strength.

Workpiece Material	Cutting Condition		
	Light	General	Heavy
P	L	M	R, H
M	L	M	R
K	L	M	R, H
S	L	M	R
N	L		
H	H		

FACE MILLING
<GENERAL CUTTING>

45°

Finishing Roughing

ASX445

P M K N S H



- Precision molded 20° positive insert.
- A wide range of chip breakers.
- Screw-on type.
- High rigidity due to employment of a carbide shim.

Fig.1
ø2"
ø2.5"

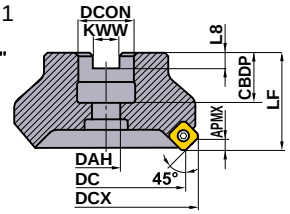


Fig.2
ø3"
ø4"
ø5"
ø6"

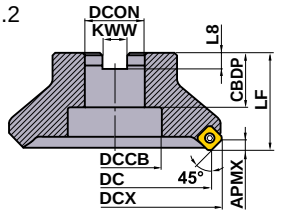
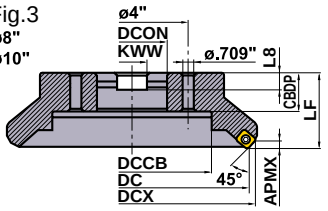


Fig.3
ø4"
ø8"
ø10"



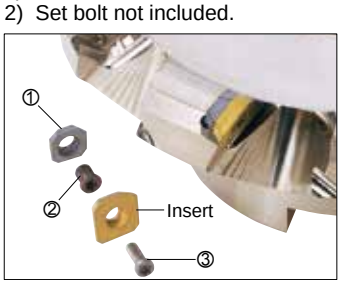
KAPR :45°
GAMP :+20°—+23° T :+4°49′—+9°53′
GAMF :-13°—-10° I :+22°55′—+23°02′

Right hand tool holder only.

ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	DCX	LF	DCON	CBDP	DAH	DCCB	KWW	L8	APMX (inch)	WT* (lbs)	Type (Fig.)
Coarse Pitch	ASX445R2504	●	4	2.500	3.009	1.575	.750	.748	.415	—	.313	.187	.236	1.5	1
	ASX445R0304C	●	4	3.000	3.520	1.969	1.000	1.024	—	1.496	.375	.219	.236	2.4	2
	ASX445R0405E	●	5	4.000	4.518	1.969	1.500	1.378	—	2.362	.625	.375	.236	4.0	2
	ASX445R0506E	●	6	5.000	5.513	2.480	1.500	1.378	—	2.362	.625	.375	.236	6.6	2
	ASX445R0607E	●	7	6.000	6.511	2.480	1.500	1.378	—	2.362	.625	.375	.236	10.4	2
	ASX445R0808M	●	8	8.000	8.509	2.480	2.500	1.378	—	5.512	1.000	.560	.236	14.6	3
	ASX445R1010M	●	10	10.000	10.508	2.480	2.500	1.378	—	7.087	1.000	.560	.236	23.7	3
Fine Pitch	ASX445R0204	●	4	2.000	2.513	1.575	.750	.748	.415	—	.313	.187	.236	.9	1
	ASX445R2505	●	5	2.500	3.009	1.575	.750	.748	.415	—	.313	.187	.236	1.5	1
	ASX445R0306C	●	6	3.000	3.520	1.969	1.000	1.024	—	1.496	.375	.219	.236	2.2	2
	ASX445R0407E	●	7	4.000	4.518	1.969	1.500	1.378	—	2.362	.625	.375	.236	3.7	2
	ASX445R0508E	●	8	5.000	5.513	2.480	1.500	1.378	—	2.362	.625	.375	.236	6.2	2
	ASX445R0610E	●	10	6.000	6.511	2.480	1.500	1.378	—	2.362	.625	.375	.236	10.1	2
	ASX445R0812M	●	12	8.000	8.509	2.480	2.500	1.378	—	5.512	1.000	.560	.236	14.6	3
	ASX445R1014M	●	14	10.000	10.508	2.480	2.500	1.378	—	7.087	1.000	.560	.236	23.7	3
Extra Fine Pitch	ASX445R0205	●	5	2.000	2.513	1.575	.750	.748	.415	—	.313	.187	.236	.9	1
	ASX445R0308C	●	8	3.000	3.520	1.969	1.000	1.024	—	1.496	.375	.219	.236	2.2	2
	ASX445R0410E	●	10	4.000	4.518	1.969	1.500	1.378	—	2.362	.625	.375	.236	3.8	2
	ASX445R0512E	●	12	5.000	5.513	2.480	1.500	1.378	—	2.362	.625	.375	.236	6.4	2
	ASX445R0616E	●	16	6.000	6.511	2.480	1.500	1.378	—	2.362	.625	.375	.236	10.3	2
	ASX445R0820M	●	20	8.000	8.509	2.480	2.500	1.378	—	5.512	1.000	.560	.236	14.6	3
	ASX445R1024M	●	24	10.000	10.508	2.480	2.500	1.378	—	7.087	1.000	.560	.236	23.7	3

1) ★ WT : Mass
2) Set bolt not included.



SPARE PARTS

Tool Holder Number	① Shim	② Shim Screw *	③ Insert Screw *	Wrench (Insert)	Wrench (Shim)
ASX445 Type	STASX445N	WCS503507H	TPS35	TIP15T	HKY35R

★ Clamp Torque (lbf-in) : WCS503507H=44, TPS35=31

● : Inventory maintained. ★ : Inventory maintained in Japan.



Fig.1

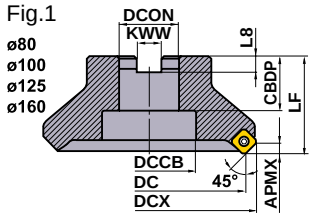


Fig.2

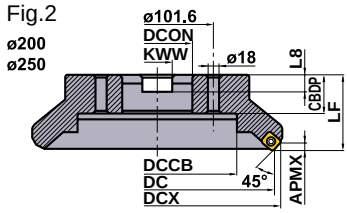
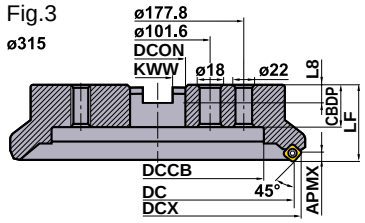


Fig.3



METRIC Standard

For inch arbors

KAPR :45°
GAMP :+20°—+23° T :+4°49′—+9°53′
GAMF :-13°—-10° I :+22°55′—+23°02′

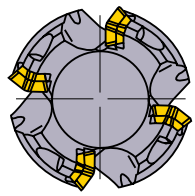
Right hand tool holder only.

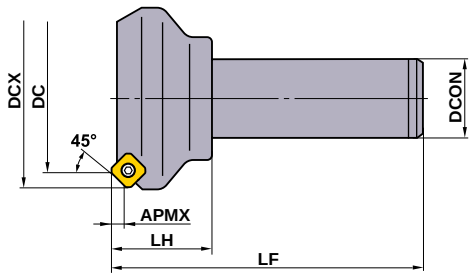
ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) [inch] DC	DCX	LF	DCON	CBDP	DCCB	KWW	L8	APMX (mm)	WT * (kg)	Type (Fig.)
Coarse Pitch	ASX445R08004C	★	4	80	93.2	50	25.4 [1.0"]	26	38	9.5	6	6	1.1	1
	ASX445R10005D	★	5	100	113.2	50	31.75 [1.25"]	32	45	12.7	8	6	1.8	1
	ASX445R12506E	★	6	125	138.0	63	38.1 [1.5"]	35	60	15.9	10	6	2.9	1
	ASX445R16007F	★	7	160	173.0	63	50.8 [2.0"]	38	80	19.1	11	6	4.7	1
	ASX445R20008K	★	8	200	212.9	63	47.625 [1.875"]	35	140	25.4	14	6	7.9	2
	ASX445R25010K	★	10	250	262.9	63	47.625 [1.875"]	35	180	25.4	14	6	12.9	2
	ASX445R31514P	★	14	315	327.9	63	47.625 [1.875"]	40	245	25.4	14	6	22.4	3
Fine Pitch	ASX445R08006C	★	6	80	93.2	50	25.4 [1.0"]	26	38	9.5	6	6	1.0	1
	ASX445R10007D	★	7	100	113.2	50	31.75 [1.25"]	32	45	12.7	8	6	1.7	1
	ASX445R12508E	★	8	125	138.0	63	38.1 [1.5"]	35	60	15.9	10	6	2.8	1
	ASX445R16010F	★	10	160	173.0	63	50.8 [2.0"]	38	80	19.1	11	6	4.6	1
	ASX445R20012K	★	12	200	212.9	63	47.625 [1.875"]	35	140	25.4	14	6	7.8	2
	ASX445R25014K	★	14	250	262.9	63	47.625 [1.875"]	35	180	25.4	14	6	12.8	2
	ASX445R31518P	★	18	315	327.9	63	47.625 [1.875"]	40	245	25.4	14	6	22.2	3
Extra Fine Pitch	ASX445R08008C	★	8	80	93.2	50	25.4 [1.0"]	26	38	9.5	6	6	1.1	1
	ASX445R10010D	★	10	100	113.2	50	31.75 [1.25"]	32	45	12.7	8	6	1.8	1
	ASX445R12512E	★	12	125	138.0	63	38.1 [1.5"]	35	60	15.9	10	6	2.9	1
	ASX445R16016F	★	16	160	173.0	63	50.8 [2.0"]	38	80	19.1	11	6	4.7	1
	ASX445R20020K	★	20	200	212.9	63	47.625 [1.875"]	35	140	25.4	14	6	7.8	2
	ASX445R25024K	★	24	250	262.9	63	47.625 [1.875"]	35	180	25.4	14	6	12.8	2
	ASX445R31528P	★	28	315	327.9	63	47.625 [1.875"]	40	245	25.4	14	6	21.8	3

1) ★ WT : Mass
2) Set bolt not included.







METRIC Standard

Right hand tool holder only.

SHANK TYPE

Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	DCX	LF	DCON	LH	APMX (mm)
ASX445R503S32	★	3	50	63.0	125	32	40	6
ASX445R634S32	★	4	63	75.9	125	32	40	6
ASX445R804S32	★	4	80	93.2	125	32	40	6

MILLING

INSERTS ➤ K019
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

METRIC Standard

For metric arbors



ø50, ø63



Over ø80

Fig.1
ø50
ø63

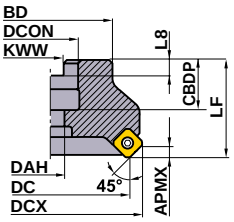


Fig.2
ø80
ø100

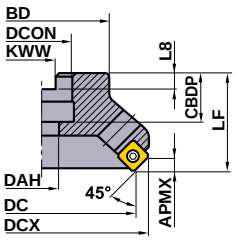


Fig.3
ø125

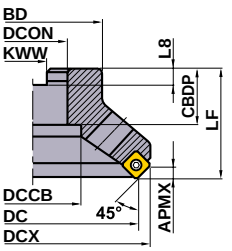


Fig.4
ø160

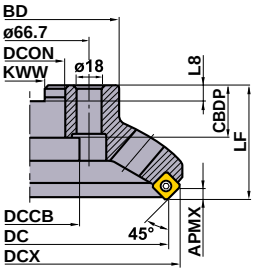
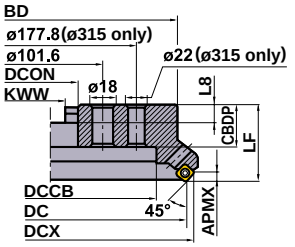


Fig.5
ø200
ø250
ø315



KAPR :45°
GAMP :+20° — +23° T :+4°49′ — +9°53′
GAMF :-13° — -10° I :+22°55′ — +23°02′

Right hand tool holder only.

ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	DCX	LF	DCON	CBDP	DAH	DCCB	BD	KWW	L8	APMX (mm)	WT* (kg)	Type (Fig.)
Coarse Pitch	**ASX445-050A03R**	★	3	50	63.0	40	22	20	11	—	45	10.4	6.3	6	0.5	1
	ASX445**-063A04R**	★	4	63	75.9	40	22	20	11	—	50	10.4	6.3	6	0.7	1
	ASX445**-080A04R**	★	4	80	93.2	50	27	22	13.5	—	56	12.4	7	6	1.0	2
	ASX445**-100A05R**	★	5	100	113.2	50	32	25	17.5	—	70	14.4	8	6	1.6	2
	ASX445**-125B06R**	★	6	125	138.0	63	40	32	—	56	80	16.4	9	6	2.4	3
	ASX445**-160C07R**	★	7	160	173.0	63	40	29	—	56	100	16.4	9	6	3.9	4
	ASX445**-200C08R**	★	8	200	212.9	63	60	32	—	135	155	25.7	14	6	6.7	5
	ASX445**-250C10R**	★	10	250	262.9	63	60	32	—	174	200	25.7	14	6	10.5	5
	ASX445**-315C14R**	★	14	315	327.9	80	60	57	—	256.8	285	25.7	14	6	22.4	5
Fine Pitch	**ASX445-050A04R**	★	4	50	63.0	40	22	20	11	—	45	10.4	6.3	6	0.4	1
	ASX445**-063A05R**	★	5	63	75.9	40	22	20	11	—	50	10.4	6.3	6	0.6	1
	ASX445**-080A06R**	★	6	80	93.2	50	27	22	13.5	—	56	12.4	7	6	0.9	2
	ASX445**-100A07R**	★	7	100	113.2	50	32	25	17.5	—	70	14.4	8	6	1.5	2
	ASX445**-125B08R**	★	8	125	138.0	63	40	32	—	56	80	16.4	9	6	2.3	3
	ASX445**-160C10R**	★	10	160	173.0	63	40	29	—	56	100	16.4	9	6	3.6	4
	ASX445**-200C12R**	★	12	200	212.9	63	60	32	—	135	155	25.7	14	6	5.8	5
	ASX445**-250C14R**	★	14	250	262.9	63	60	32	—	174	200	25.7	14	6	10.6	5
	ASX445**-315C18R**	★	18	315	327.9	80	60	57	—	256.8	285	25.7	14	6	22.2	5
Extra Fine Pitch	**ASX445-050A05R**	★	5	50	63.0	40	22	20	11	—	45	10.4	6.3	6	0.4	1
	ASX445**-063A06R**	★	6	63	75.9	40	22	20	11	—	50	10.4	6.3	6	0.6	1
	ASX445**-080A08R**	★	8	80	93.2	50	27	22	13.5	—	56	12.4	7	6	0.9	2
	ASX445**-100A10R**	★	10	100	113.2	50	32	25	17.5	—	70	14.4	8	6	1.5	2
	ASX445**-125B12R**	★	12	125	138.0	63	40	32	—	56	80	16.4	9	6	2.3	3
	ASX445**-160C16R**	★	16	160	173.0	63	40	29	—	56	100	16.4	9	6	3.6	4
	ASX445**-200C20R**	★	20	200	212.9	63	60	32	—	135	155	25.7	14	6	6.5	5
	ASX445**-250C24R**	★	24	250	262.9	63	60	32	—	174	200	25.7	14	6	10.3	5
	ASX445**-315C28R**	★	28	315	327.9	80	60	57	—	256.8	285	25.7	14	6	21.8	5

1) ★ WT : Mass
2) Set bolt not included.

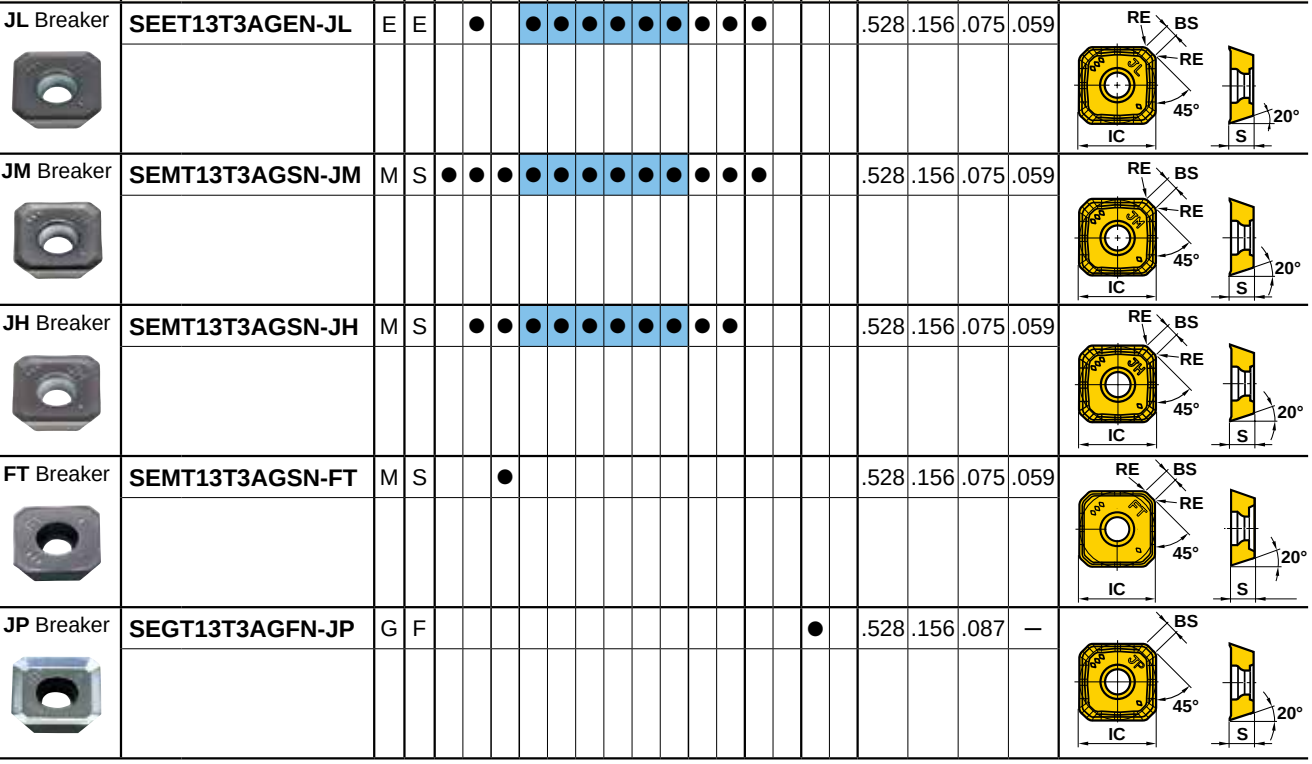
● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case> <1 insert in one case for CBN/PCD>

INSERTS WITH BREAKER

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy
H	Hardened Steel

Cutting Conditions :
● : Stable Cutting ◔ : General Cutting
✠ : Unstable Cutting
Honing :
E : Round **F :** Sharp
S : Chamfer + Hone **T :** Chamfer

Application	Shape	Order Number	Class	Honing	Coated F7010	Coated F7030	Coated MC5020	Coated MP6120 (NEW)	Coated MP6130 (NEW)	Coated MP7130 (NEW)	Coated MP7140 (NEW)	Coated MP9120 (NEW)	Coated MP9130 (NEW)	Coated VP15TF	Coated VP30RT	Cermet NX4545	Carbide HTi10	IC	S	BS	RE	Geometry
Finish–Light Cutting	**JL** Breaker	**SEET13T3AGEN-JL**	E	E		●		●	●	●	●	●	●	●	●	●		.528	.156	.075	.059	
Light–Rough Cutting	**JM** Breaker	**SEMT13T3AGSN-JM**	M	S	●	●	●	●	●	●	●	●	●	●	●	●		.528	.156	.075	.059	
Medium–Heavy Cutting	**JH** Breaker	**SEMT13T3AGSN-JH**	M	S		●	●	●	●	●	●	●	●	●	●			.528	.156	.075	.059	
Roughing For Cast Iron	**FT** Breaker	**SEMT13T3AGSN-FT**	M	S			●											.528	.156	.075	.059	
For Aluminium Alloy	**JP** Breaker	**SEGT13T3AGFN-JP**	G	F													●	.528	.156	.087	—	



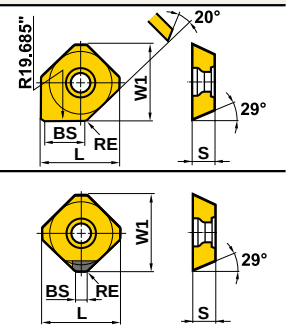
■ = MIRACLE SIGMA

■ Instructions for using JP breaker handling

✶The JP breaker has sharp cutting edge. Please wear gloves when installing to prevent.
✶During machining of aluminum alloy, chip welding can occur that can cause fracturing of the insert.
✶Wet cutting is recommended.

WIPER INSERTS

Shape	Order Number	Honing	Coated MC5020	Coated VP15TF	Cermet NX2525	Coated Cermet VP25N	Carbide HTi05T	CBN MB710	PCD MD220	L	W1	S	BS	RE	Geometry
	WEEW13T3AGER8C	E	●	●			●			.649	.654	.156	.295	.059	
	WEEW**13T3AGTR8C**	T			●	●				.649	.654	.156	.295	.059	
	NP-WEEW13T3AGFR3C	F							●	.649	.654	.156	.118	.059	
	NP-WEEW**13T3AGTR3C**	T						●		.649	.654	.156	.118	.059	



MILLING

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Finish—Light Cutting		Light—Rough Cutting		Medium—Heavy Cutting	
					Feed per Tooth (mm/tooth)	Breaker	Feed per Tooth (mm/tooth)	Breaker	Feed per Tooth (mm/tooth)	Breaker
P	Mild Steel	≤180HB	**F7030**	920 (690—1150)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			MP6120 VP15TF	820 (655—985)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			MP6130	800 (620—950)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			VP30RT	755 (590—920)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			NX4545	590 (425—755)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
	Carbon Steel Alloy Steel	180—280HB	**F7030**	820 (655—985)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			MP6120 VP15TF	720 (560—885)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			MP6130	600 (480—740)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			VP30RT	490 (395—590)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
			NX4545	490 (390—590)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
		280—350HB	**F7030**	590 (425—755)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			MP6120 VP15TF	460 (330—590)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			MP6130	400 (300—490)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			VP30RT	330 (260—395)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
			NX4545	330 (260—390)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
M	Stainless Steel	≤270HB	**MP7130 VP15TF**	720 (560—885)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			MP7140 VP30RT	655 (490—820)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			NX4545	490 (395—590)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
K	Cast Iron Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	655 (400—820)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH FT**
			VP15TF	590 (425—826)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
		Tensile Strength ≥450MPa	**MC5020**	360 (260—490)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH FT**
N	Aluminum Alloy	—	**HTi10**	2130 (1000—3300)	.006 (.004—.008)	**JP**	.008 (.004—.012)	**JP**	.012 (.008—.016)	**JP**
S	Titanium Alloy	—	**MP9120 VP15TF**	165 (130—195)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
			MP9130	140 (100—180)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
	Heat Resistant Alloy	—	**MP9120 VP15TF**	130 (65—165)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
			MP9130	110 (55—140)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
H	Hardened Steel	40—55HRC	**VP15TF**	260 (195—330)	.004 (.002—.006)	**JL**	.006 (.004—.008)	**JM**	.008 (.004—.012)	**JH**

INSTRUCTIONS FOR USE OF WIPER INSERTS



Fig.1



Fig.2

- Wiper inserts for ASX445 are single-cornered.
- When installing the wiper insert, place the insert so that the cutting edge is located as shown Fig.1.
  Do not install the wiper insert as Fig.2
- Recommended depth of cut is ap = .008-.020(inch).
  (Be aware of cutting load if the depth of cut is over the recommendation.)
- The major cutting edge of a wiper insert should be set inside as shown. This is to prevent heavy loads on the wiper and ensure the regular insert after the wiper takes the cutting load. To prevent fracture, set the feed under .008 inch/tooth.
- Excellent finished surfaces achieved with one wiper.
- Set more than 2 wiper inserts, equally spaced, when the feed per revolution is larger than the width of the wiper edge.

RECOMMENDED CUTTING CONDITIONS WHEN USING A WIPER INSERT

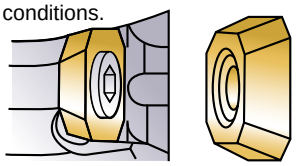
Work Material	Grade	Recommended Cutting Speed (SFM)
P	**VP25N**	655 (260—820)
	VP15TF	590 (260—820)
M	**VP15TF**	390—885
K	**MC5020**	425—820
	VP15TF	
S	**VP15TF**	65—165
H	**VP15TF**	130—260

●Recommended depth of cut (ap) is .008 inch- .020 inch, and feed per tooth (fz) is up to .008 inch/tooth.

FEATURES

STABLE, LONG TOOL LIFE, HIGH ACCURACY BODY

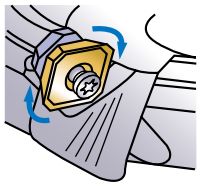
A carbide shim with Mitsubishi's proprietary Anti-Fly Insert (AFI) mechanism provides excellent insert location characteristics, permitting stable cutting even under high load conditions.



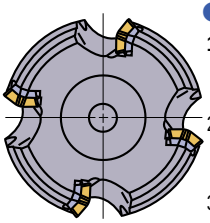
The cutter body is made from a special alloy that provides high strength at high temperature. A special surface treatment improves the corrosion resistance.



The ASX cutter uses screw-on type inserts that allow easy clamping of the inserts with high location precision. Indexing of the inserts can be performed without completely removing the screw.

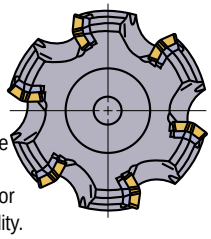


EFFECTIVE FOR VARIOUS MACHINING APPLICATIONS



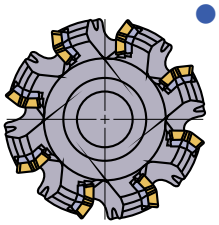
Coarse Pitch Type

1. **The 1st recommendation for cutting steel and stainless steel.**
2. For deep cutting and high feed rates with large-volume chip discharge.
3. Longer overhang possible for relatively low machining riidity.



Fine Pitch Type

1. **The 1st recommendation type for cast iron, hardened steel and heat-resistant alloys.**
2. For shallow cutting with low feed rates and low-volume chip discharge.



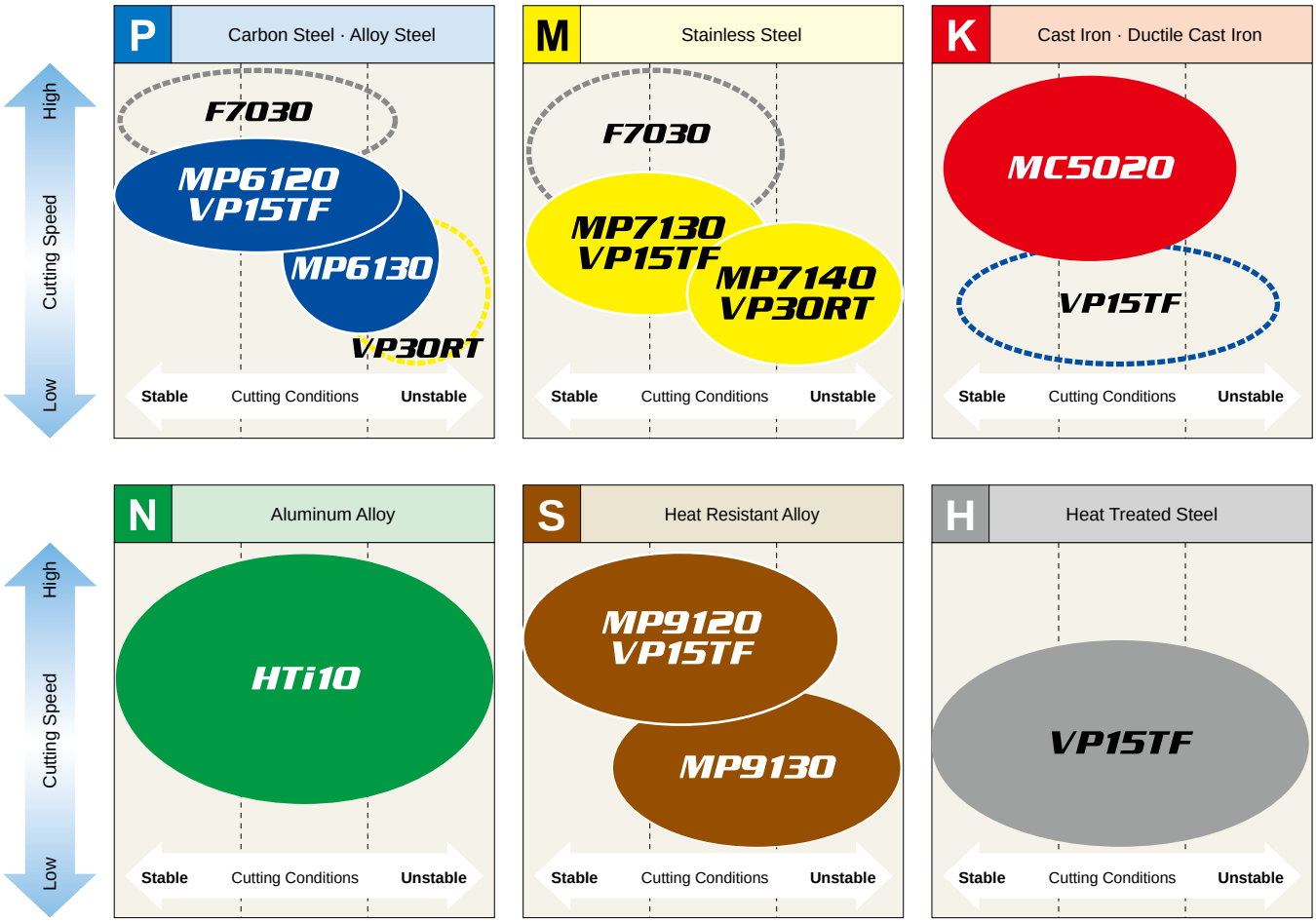
Extra Fine Pitch Type

1. **The 1st recommendation for cast iron.**
2. For cutting operations where chip dischange volume is small and high table feed is desired.

CHIPBREAKERS FOR A WIDE RANGE OF APPLICATIONS

JL Finish to Light cutting Breaker	**JM** Light to Rough Cutting Breaker	**JH** Medium to Heavy cutting Breaker	**JP** Aluminum alloy cutting Breaker	**FT** Rough cutting for cast iron Breaker
				
High accuracy insert with ground-finished periphery. Large rake angle leading to low cutting resistance.	High accuracy M class insert. For a wide range of work-piece materials and cutting conditions.	High accuracy M class insert. Strong cutting edge for high fracture resistance.	High accuracy insert with ground-finished periphery. Large rake angle and mirror-finished rake face for sharp cutting performance and high welding resistance.	High accuracy M class inserts. High fracture-resistant flat-top inserts.
①Workpiece rigidity is low.	**①General cutting.**	**①Interrupted cutting. ②Scaling.**	**①General machining of aluminum alloy.**	**①For rough machining of scaled cast iron.**

INSERT GRADES FOR A WIDE RANGE OF MATERIALS



(Note) When machining steel or stainless steel where the emphasis is on surface finish, use cermet grade NX4545.
Stable Cutting : Continuous cutting, Constant depth of cut, Pre-machined securely clamped component cutting
Unstable Cutting : Heavy interrupted, Irregular depth of cut, Low clamping rigidity cutting

FACE MILLING <GENERAL CUTTING>

40° Finishing Roughing

AHX640S

P M K N S H



- Heptagonal double-sided insert.
- Economical 14 corner use.

Fig.1 ø2.5" ø3"

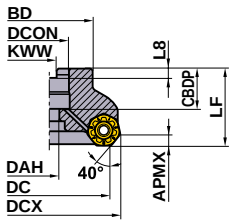


Fig.2 ø4" ø5" ø6"

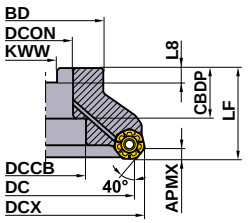
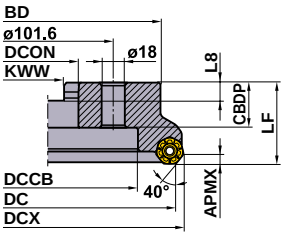
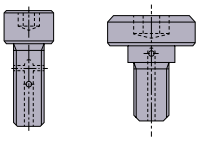


Fig.3 ø8"



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ2.5	HSCU37513H	①
ϕ3	HSCU62516H	
ϕ4	HSCU75016H	②
ϕ5	MBAU75016H	
ϕ6	MBAU100016H	
ϕ8	—	—



KAPR :40° T :+10° (When using the MK breaker insert.)
GAMP :-6° T :+20° (When using the MP/MM breaker insert.)
GAMF :-5° I :+9° — +10°

Type	Order Number	Stock R	Stock L	Coolant Thru ★1	Number of Teeth	DC	DCX	LF	DCON	CBDP	DAH	DCCB	BD	KWW	L8	WT ★3 (lbs)	APMX (inch)	Type (Fig.)	Clamp Screw ★2	Wrench
Coarse Pitch	**AHX640SUR/L2504AA**	●	□	Y	4	2.5	2.994	2	.75	.748	.413	—	1.75	.313	.187	2	.236	1	CS5015060T	TKY20T
	AHX640SUR/L**0304DA**	●	□	Y	4	3	3.494	2.5	1.25	1.26	.669	—	2.88	.5	.281	3.7	.236	1	CS5015060T	TKY20T
	AHX640SUR/L**0405EA**	●	□	Y	5	4	4.494	2.5	1.5	1.181	—	.787	3.81	.625	.375	6.4	.236	2	CS5015060T	TKY20T
	AHX640SUR/L**0506EA**	●	□	Y	6	5	5.494	2.5	1.5	1.575	—	2.205	3.81	.625	.375	8.2	.236	2	CS5015060T	TKY20T
	AHX640SUR/L**0607FA**	●	□	Y	7	6	6.494	2.5	2	1.693	—	3.228	4.88	.75	.437	11.7	.236	2	CS5015060T	TKY20T
	AHX640SUR/L**0808MN**	●	□	N	8	8	8.494	2.5	2.5	1.378	—	5.512	6.89	1	.56	18.5	.236	3	CS5015060T	TKY20T
Fine Pitch	**AHX640SUR/L2505AA**	●	□	Y	5	2.5	2.994	2	.75	.748	.413	—	1.75	.313	.187	1.8	.236	1	CS5015060T	TKY20T
	AHX640SUR/L**0306DA**	●	□	Y	6	3	3.494	2.5	1.25	1.26	.669	—	2.88	.5	.281	3.5	.236	1	CS5015060T	TKY20T
	AHX640SUR/L**0407EA**	●	□	Y	7	4	4.494	2.5	1.5	1.181	—	.787	3.81	.625	.375	6.4	.236	2	CS5015060T	TKY20T
	AHX640SUR/L**0508EA**	●	□	Y	8	5	5.494	2.5	1.5	1.575	—	2.205	3.81	.625	.375	7.9	.236	2	CS5015060T	TKY20T
	AHX640SUR/L**0610FA**	●	□	Y	10	6	6.494	2.5	2	1.693	—	3.228	4.88	.75	.437	11.2	.236	2	CS5015060T	TKY20T
	AHX640SUR/L**0812MN**	●	□	N	12	8	8.494	2.5	2.5	1.378	—	5.512	6.89	1	.56	18.3	.236	3	CS5015060T	TKY20T

★1 Y=Yes, N=No
★2 Clamp Torque (lbf-in) : CS5015060T=44
★3 WT : Mass
★4 The cutter body includes a set bolt for an arbor.

● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.



Fig.1
ø80

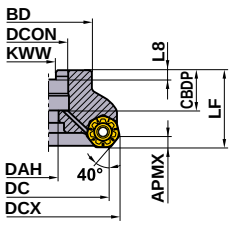


Fig.2
ø100
ø125
ø160

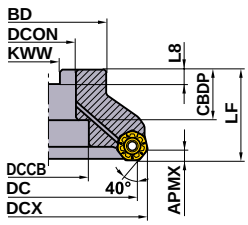
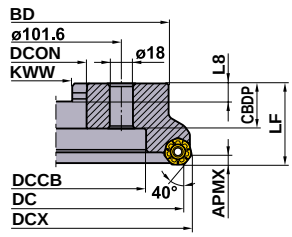


Fig.3
ø200



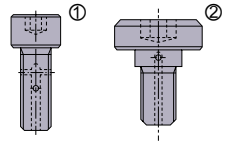
Right hand tool holder only.

METRIC Standard

For inch arbors

KAPR :40° T :+10° (When using the MK breaker insert.)
GAMP :-6° T :+20° (When using the MP/MM breaker insert.)
GAMF :-5° I :+9° – +10°

DC	Set Bolt	Geometry
ϕ80	HSC12035H	①
ϕ100	MBA16033H	②
ϕ125	MBA20040H	
ϕ160	MBA24045H	
ϕ200	–	–



Type	Order Number	Stock	Coolant Thru ✶1	Number of Teeth	Dimensions (mm) [inch]										✶3 WT	APMX	Type (Fig.)	✶2 Clamp Screw	Wrench
		R			DC	DCX	LF	DCON	CBDP	DAH	DCCB	BD	KWW	L8	(kg)	(mm)			
Coarse Pitch	**AHX640SR08004CA**	★	Y	4	80	92.6	50	25.4 [1.0"]	26	13	–	56	9.5	6	1.1	6	1	CS5015060T	TKY20T
	AHX640S**R10005DA**	★	Y	5	100	112.6	50	31.75 [1.25"]	35	–	45	70	12.7	8	1.7	6	2	CS5015060T	TKY20T
	AHX640S**R12506EA**	★	Y	6	125	137.6	63	38.1 [1.5"]	42	–	56	80	15.9	10	3.0	6	2	CS5015060T	TKY20T
	AHX640S**R16007FA**	★	N	7	160	172.6	63	50.8 [2.0"]	43	–	72	100	19.1	11	4.9	6	2	CS5015060T	TKY20T
	AHX640S**R20008KN**	★	N	8	200	212.6	63	47.625 [1.875"]	35	–	140	175	25.4	14.22	8.2	6	3	CS5015060T	TKY20T
Fine Pitch	**AHX640SR08006CA**	★	Y	6	80	92.6	50	25.4 [1.0"]	26	13	–	56	9.5	6	1.0	6	1	CS5015060T	TKY20T
	AHX640S**R10007DA**	★	Y	7	100	112.6	50	31.75 [1.25"]	35	–	45	70	12.7	8	1.5	6	2	CS5015060T	TKY20T
	AHX640S**R12508EA**	★	Y	8	125	137.6	63	38.1 [1.5"]	42	–	56	80	15.9	10	2.9	6	2	CS5015060T	TKY20T
	AHX640S**R16010FA**	★	N	10	160	172.6	63	50.8 [2.0"]	43	–	72	100	19.1	11	4.7	6	2	CS5015060T	TKY20T
	AHX640S**R20012KN**	★	N	12	200	212.6	63	47.625 [1.875"]	35	–	140	175	25.4	14.22	7.9	6	3	CS5015060T	TKY20T

✶1 Y=Yes, N=No
✶2 Clamp Torque (lbf-in) : CS5015060T=44
✶3 WT : Mass
✶4 Set bolt not included.

INSERTS ➤ K027
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig.1
ø63
ø80

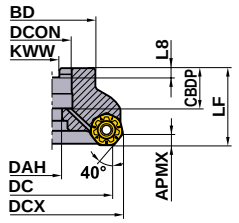


Fig.2
ø100
ø125

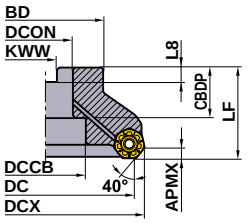


Fig.3
ø160

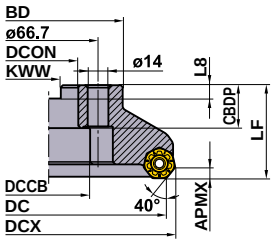
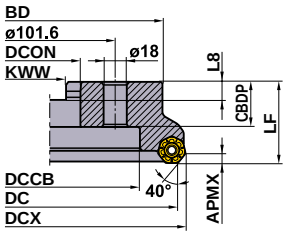


Fig.4
ø200



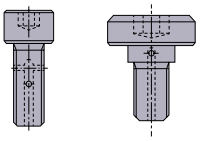
Right hand tool holder only.

METRIC Standard

For metric arbors

KAPR :40° T :+10° (When using the MK breaker insert.)
GAMP :-6° T :+20° (When using the MP/MM breaker insert.)
GAMF :-5° I :+9° ─ +10°

Cutter Diameter DC	Set Bolt	Geometry
ϕ63	HSC10030H	①
ϕ80	HSC12035H	
ϕ100	MBA16033H	②
ϕ125	MBA20040H	
ϕ160	─	─
ϕ200	─	─

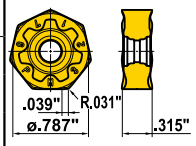
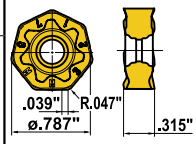
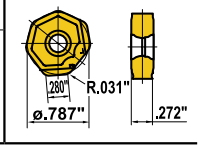


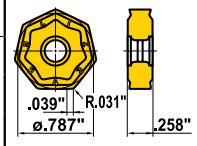
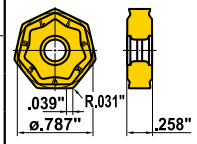
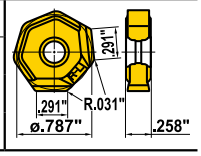
Type	Order Number	Stock R	Coolant Thru ★1	Number of Teeth	Dimensions (mm) DC	DCX	LF	DCON	CBDP	DAH	DCCB	BD	KWW	L8	★3 WT (kg)	APMX (mm)	Type (Fig.)	★2 Clamp Screw	Wrench
Coarse Pitch	AHX640S-063A04AR	★	Y	4	63	75.6	50	22	20	11	─	50	10.4	6.3	0.7	6	1	CS5015060T	TKY20T
	AHX640S-080A04AR	★	Y	4	80	92.6	50	27	23	13	─	56	12.4	7	1.1	6	1	CS5015060T	TKY20T
	AHX640S-100B05AR	★	Y	5	100	112.6	50	32	32	─	45	78	14.4	8	1.7	6	2	CS5015060T	TKY20T
	AHX640S-125B06AR	★	Y	6	125	137.6	63	40	42	─	56	89	16.4	9	3.1	6	2	CS5015060T	TKY20T
	AHX640S-160C07NR	★	N	7	160	172.6	63	40	29	─	56	120	16.4	9	5.4	6	3	CS5015060T	TKY20T
	AHX640S-200C08NR	★	N	8	200	212.6	63	60	32	─	140	175	25.7	14.22	7.8	6	4	CS5015060T	TKY20T
Fine Pitch	AHX640S-063A05AR	★	Y	5	63	75.6	50	22	20	11	─	50	10.4	6.3	0.6	6	1	CS5015060T	TKY20T
	AHX640S-080A06AR	★	Y	6	80	92.6	50	27	23	13	─	56	12.4	7	1.0	6	1	CS5015060T	TKY20T
	AHX640S-100B07AR	★	Y	7	100	112.6	50	32	32	─	45	78	14.4	8	1.6	6	2	CS5015060T	TKY20T
	AHX640S-125B08AR	★	Y	8	125	137.6	63	40	42	─	56	89	16.4	9	3.0	6	2	CS5015060T	TKY20T
	AHX640S-160C10NR	★	N	10	160	172.6	63	40	29	─	56	120	16.4	9	5.2	6	3	CS5015060T	TKY20T
	AHX640S-200C12NR	★	N	12	200	212.6	63	60	32	─	140	175	25.7	14.22	7.5	6	4	CS5015060T	TKY20T

★1 Y=Yes, N=No
★2 Clamp Torque (lbf-in) : CS5015060T=44
★3 WT : Mass
★4 Set bolt not included.

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

INSERTS

Application	Shape	Order Number	Class	Horning	Coated MC5020	Coated MP7030	Coated VP15TF	Geometry
For Steel General Purpose	MP Insert 	NNMU200708ZEN-MP	M	E			●	
For Stainless	MM Insert 	NNMU200712ZER-MM	M	E		●		
Wiper Insert	WP Insert 	WNEU2007ZEN7C-WP	E	E			●	

Application	Shape	Order Number	Class	Horning	Coated MC5020	Coated VP15TF NEW	Coated VP20RT NEW	Geometry
For Cast Iron	MK Insert  General Use	NNMU200608ZEN-MK	M	E	●	●	●	
For Cast Iron	HK Insert  Strong Cutting Edge Type	NNMU200608ZEN-HK	M	E	●	●	●	
For Cast Iron	WK Insert 	WNEU2006ZEN7C-WK	E	E	●			

■ = MIRACLE SIGMA

RECOMMENDED CUTTING CONDITIONS

DRY CUTTING

	Work Material	Hardness	Insert Breaker	Grade	Cutting Speed (SFM)	Feed per Tooth (IPT)	Axial depth of cut **ap** (inch)
P	Mild Steel (AISI 1010)	≤180HB	**MP**	**VP15TF**	820 (655 — 985)	.012 (.008 — .016)	.197
	Carbon Steel, Alloy Steel (AISI 1045,4140)	180—280HB	**MP**	**VP15TF**	720 (555 — 885)	.012 (.008 — .016)	.197
	Carbon Steel, Alloy Steel (AISI 4340)	280—350HB	**MP**	**VP15TF**	460 (330 — 590)	.012 (.008 — .016)	.197
M	Austenitic Stainless Steel (AISI 304,316)	≤200HB	**MM**	**MP7030**	655 (490 — 820)	.008 (.004 — .012)	.197
	Austenitic Stainless Steel (AISI 304LN,316LN)	>200HB	**MM**	**MP7030**	490 (330 — 655)	.008 (.004 — .012)	.197
	Duplex Stainless Steel (ASTM S 32900)	≤280HB	**MM**	**MP7030**	460 (330 — 590)	.006 (.002 — .010)	.197
	Ferritic and Martensitic Stainless Steel (ASTM S 41000,S 43000)	≤200HB	**MM**	**MP7030**	655 (490 — 820)	.008 (.004 — .012)	.197
	Ferritic and Martensitic Stainless Steel (ASTM S 43100,S 42000)	>200HB	**MM**	**MP7030**	490 (330 — 655)	.008 (.004 — .012)	.197
	Hardened Stainless Steel (ASTM S 17400,S 17700)	<450HB	**MM**	**MP7030**	425 (330 — 525)	.006 (.002 — .010)	.197
K	Gray Cast Iron (AISI No 45 B)	Tensile Strength ≤350MPa	**MK,HK**	**MC5020**	720 (490 — 985)	.012 (.008 — .016)	.197
			MP,MK,HK	**VP15TF VP20RT**	590 (425 — 755)	.012 (.008 — .016)	.197
	Ductile Cast Iron (ASTM 65-45-12)	Tensile Strength ≤450MPa	**MK,HK**	**MC5020**	655 (490 — 820)	.008 (.004 — .012)	.197
			MP,MK,HK	**VP15TF VP20RT**	555 (390 — 720)	.008 (.004 — .012)	.197
	Ductile Cast Iron (AISI 100-70-03)	Tensile Strength ≤800MPa	**MK,HK**	**MC5020**	555 (490 — 655)	.008 (.004 — .012)	.197
			MP,MK,HK	**VP15TF VP20RT**	490 (410 — 575)	.008 (.004 — .012)	.197
H	Hardened Steel (ASTM H13)	40—55HRC	**MP**	**VP15TF**	260 (195 — 330)	.006 (.004 — .008)	.118

(Note 1) Recommend wet cutting for good surface finishing of stainless steel.
(Note 2) When clamp rigidity is low and tool is overhanged, we recommend to adjust the cutting speed and feed 70% to 80% than the conditon above.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

WET CUTTING

	Work Material	Hardness	Insert Breaker	Grade	Cutting Speed (SFM)	Feed per Tooth (IPT)	Axial depth of cut **ap** (inch)
M	Austenitic Stainless Steel (AISI 304,316)	≤200HB	**MM**	**MP7030**	410 (330 — 490)	.006 (.004 — .008)	.197
	Austenitic Stainless Steel (AISI 304LN,316LN)	>200HB	**MM**	**MP7030**	330 (245 — 410)	.006 (.004 — .008)	.197
	Duplex Stainless Steel (ASTM S 32900)	≤280HB	**MM**	**MP7030**	260 (195 — 330)	.004 (.002 — .006)	.197
	Ferritic and Martensitic Stainless Steel (ASTM S 41000,S 43000)	≤200HB	**MM**	**MP7030**	410 (330 — 490)	.006 (.004 — .008)	.197
	Ferritic and Martensitic Stainless Steel (ASTM S 43100,S 42000)	>200HB	**MM**	**MP7030**	330 (245 — 410)	.006 (.004 — .008)	.197
	Hardened Stainless Steel (ASTM S 17400,S 17700)	<450HB	**MM**	**MP7030**	230 (165 — 295)	.004 (.002 — .006)	.197
S	Titanium Alloy (Ti-6A-4V)	—	**MM**	**MP7030**	130 (65 — 165)	.006 (.004 — .008)	.118
	Heat Resistant Alloy (Inconel718)	—	**MM**	**MP7030**	130 (65 — 165)	.006 (.004 — .008)	.118

(Note 1) With low workpiece clamping rigidity or long overhang of the tool, adjust cutting speed and feed to 70 or 80 % of the recommended conditons above.

CUTTING CONDITION WITH WIPER INSERT

	Work Material	Hardness	Main Insert	Grade	Wiper Insert	Grade	Cutting Speed (SFM)	Feed per Tooth (IPT)	Axial depth of cut **ap** (inch)
P	Mild Steel (AISI 1010)	≤180HB	**MP**	**VP15TF**	**WP**	**VP15TF**	820 (655 — 985)	.012 (.008 — .016)	.0197
	Carbon Steel, Alloy Steel (AISI 1045,4140)	180—280HB	**MP**	**VP15TF**	**WP**	**VP15TF**	720 (555 — 885)	.012 (.008 — .016)	.0197
	Carbon Steel, Alloy Steel (AISI 4340)	280—350HB	**MP**	**VP15TF**	**WP**	**VP15TF**	460 (330 — 590)	.012 (.008 — .016)	.0197
K	Gray Cast Iron (AISI No 45 B)	Tensile Strength ≤350MPa	**MK,HK**	**MC5020**	**WK**	**MC5020**	1050 (820 — 1310)	.012 (.008 — .016)	.0197
			MP	**VP15TF VP20RT**	**WP**	**VP15TF**	720 (490 — 985)	.012 (.008 — .016)	.0197
	Ductile Cast Iron (ASTM 65-45-12)	Tensile Strength ≤450MPa	**MK,HK**	**MC5020**	**WK**	**MC5020**	820 (655 — 985)	.008 (.004 — .012)	.0197
			MP	**VP15TF VP20RT**	**WP**	**VP15TF**	655 (490 — 820)	.008 (.004 — .012)	.0197
	Ductile Cast Iron (AISI 100-70-03)	Tensile Strength ≤800MPa	**MK,HK**	**MC5020**	**WK**	**MC5020**	720 (655 — 820)	.008 (.004 — .012)	.0197
			MP	**VP15TF VP20RT**	**WP**	**VP15TF**	555 (510 — 655)	.008 (.004 — .012)	.0197
S	Heat Resistant Alloy	—	**MP**	**VP15TF**	**WP**	**VP15TF**	130 (65 — 165)	.006 (.004 — .008)	.0197
H	Hardened Steel (ASTM H13)	40—55HRC	**MP**	**VP15TF**	**WP**	**VP15TF**	260 (195 — 330)	.006 (.004 — .008)	.0197

(Note 1) With low workpiece clamping rigidity or long overhang of the tool, adjust cutting speed and feed to 70 or 80 % of the recommended conditons above.

FACE MILLING 40°

<HIGH FEED CUTTING FOR CAST IRON>

Finishing Roughing

AHX640W

P M **K** N S H



- Heptagonal double-sided insert.
- Economical 14 corner use.
- Fine pitch design allows high feed milling.

Fig.1 ø3" ø4"

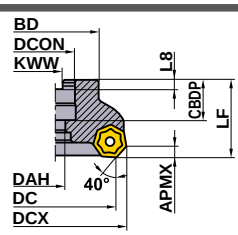


Fig.2 ø5" ø6"

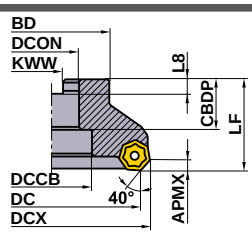


Fig.3 ø8" ø10"

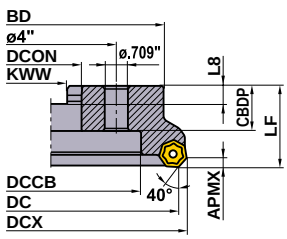
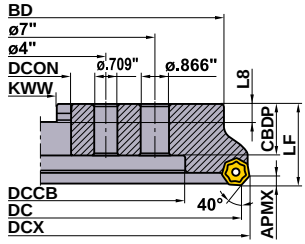


Fig.4 ø12"



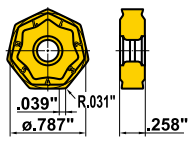
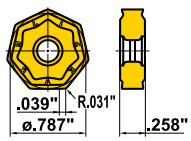
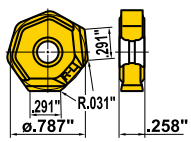
KAPR :40°
GAMP :-6° T :+10°
GAMF :-4° I :+9°—+10° (T, I : When using the MK breaker insert)

Right hand tool holder shown.

Type	Order Number	Stock R	Stock L	Number of Teeth	DC	DCX	LF	DCON	CBDP	DAH	DCCB	BD	KWW	L8	APMX (inch)	WT* (lbs)	Type (Fig.)
Extra Fine Pitch	**AHX640WR/L0308D**	●	□	8	3.000	3.494	2.500	1.250	1.260	.669	—	2.874	.500	.281	.236	4.2	1
	AHX640WR/L**0410E**	●	□	10	4.000	4.494	2.500	1.500	1.181	.787	—	3.799	.625	.375	.236	7.3	1
	AHX640WR/L**0512E**	●	□	12	5.000	5.494	2.500	1.500	1.378	—	2.362	3.799	.625	.375	.236	8.8	2
	AHX640WR/L**0614F**	●	□	14	6.000	6.494	2.500	2.000	1.496	—	3.150	4.724	.750	.437	.236	12.6	2
	AHX640WR/L**0820M**	●	□	20	8.000	8.494	2.500	2.500	1.378	—	5.512	6.890	1.000	.560	.236	19.6	3
	AHX640WR/L**1024M**	●	□	24	10.000	10.494	2.500	2.500	1.378	—	7.087	8.661	1.000	.560	.236	32.0	3
	AHX640WR/L**1228M**	●	□	28	12.000	12.494	2.500	2.500	1.575	—	9.646	11.220	1.000	.560	.236	49.2	4
Super Extra Fine Pitch	**AHX640WR/L0310D**	●	□	10	3.000	3.494	2.500	1.250	1.260	.669	—	2.874	.500	.281	.236	4.2	1
	AHX640WR/L**0414E**	●	□	14	4.000	4.494	2.500	1.500	1.181	.787	—	3.799	.625	.375	.236	7.3	1
	AHX640WR/L**0518E**	●	□	18	5.000	5.494	2.500	1.500	1.378	—	2.362	3.799	.625	.375	.236	8.8	2
	AHX640WR/L**0620F**	●	□	20	6.000	6.494	2.500	2.000	1.496	—	3.150	4.724	.750	.437	.236	12.6	2
	AHX640WR/L**0828M**	●	□	28	8.000	8.494	2.500	2.500	1.378	—	5.512	6.890	1.000	.560	.236	19.6	3
	AHX640WR/L**1036M**	●	□	36	10.000	10.494	2.500	2.500	1.378	—	7.087	8.661	1.000	.560	.236	32.0	3
	AHX640WR/L**1242M**	●	□	42	12.000	12.494	2.500	2.500	1.575	—	9.646	11.220	1.000	.560	.236	49.2	4

1) ✱ WT : Mass
2) Set bolt not included.

INSERTS

Shape	Order Number	Class	Honing	Coated MC5020	Coated VP15TF (NEW)	Coated VP20RT (NEW)	Geometry
MK breaker  General Use	NNMU200608ZEN-MK	M	E	●	●	●	
HK breaker  Strong Cutting Edge Type	NNMU200608ZEN-HK	M	E	●	●	●	
Wiper 	WNEU2006ZEN7C-WK	E	E	●			

● : Inventory maintained.
□ : Non stock, produced to order only.
<10 inserts in one case>

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig.1 ø80

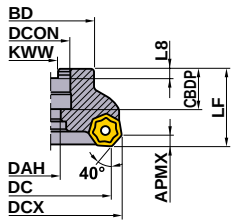


Fig.2 ø100 ø125 ø160

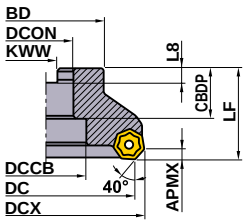


Fig.3 ø200 ø250

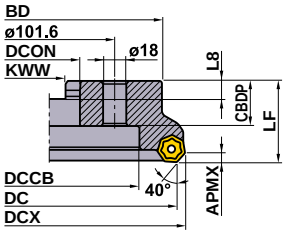
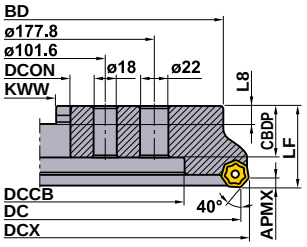


Fig.4 ø315



METRIC Standard

For inch arbors

KAPR :40°
GAMP :-6° T :+10°
GAMF :-4° I :+9°—+10° (T, I : When using the MK breaker insert)

Right hand tool holder shown.

Type	Order Number	Stock R	Stock L	Number of Teeth	DC	DCX	LF	DCON	CBDP	DAH	DCCB	BD	KWW	L8	APMX (mm)	WT* (kg)	Type (Fig.)
					Dimensions (mm) [inch]												
Extra Fine Pitch	**AHX640WR/L08008C**	★	★	8	80	92.6	50	25.4 [1.0"]	26	13	—	56	9.5	6	6	1.5	1
	AHX640WR/L**10010D**	★	★	10	100	112.6	50	31.75 [1.25"]	32	—	45	70	12.7	8	6	2.1	2
	AHX640WR/L**12512E**	★	★	12	125	137.6	63	38.1 [1.5"]	35	—	56	80	15.9	10	6	3.5	2
	AHX640WR/L**16016F**	★	★	16	160	172.6	63	50.8 [2.0"]	38	—	72	100	19.1	11	6	5.6	2
	AHX640WR/L**20020K**	★	★	20	200	212.6	63	47.625 [1.875"]	35	—	140	175	25.4	14.22	6	9.0	3
	AHX640WR/L**25024K**	★	★	24	250	262.6	63	47.625 [1.875"]	35	—	180	220	25.4	14.22	6	14.4	3
	AHX640WR/L**31528P**	★	★	28	315	327.6	63	47.625 [1.875"]	40	—	225	285	25.4	14.22	6	23.8	4
Super Extra Fine Pitch	**AHX640WR/L08010C**	★	★	10	80	92.6	50	25.4 [1.0"]	26	13	—	56	9.5	6	6	1.5	1
	AHX640WR/L**10014D**	★	★	14	100	112.6	50	31.75 [1.25"]	32	—	45	70	12.7	8	6	2.1	2
	AHX640WR/L**12518E**	★	★	18	125	137.6	63	38.1 [1.5"]	35	—	56	80	15.9	10	6	3.5	2
	AHX640WR/L**16022F**	★	★	22	160	172.6	63	50.8 [2.0"]	38	—	72	100	19.1	11	6	5.6	2
	AHX640WR/L**20028K**	★	★	28	200	212.6	63	47.625 [1.875"]	35	—	140	175	25.4	14.22	6	9.0	3
	AHX640WR/L**25036K**	★	★	36	250	262.6	63	47.625 [1.875"]	35	—	180	220	25.4	14.22	6	14.4	3
	AHX640WR/L**31544P**	★	★	44	315	327.6	63	47.625 [1.875"]	40	—	225	285	25.4	14.22	6	23.8	4

1) ★ WT : Mass
2) Set bolt not included.



SPARE PARTS

Tool Holder Number	Wedge	Clamp Screw *	Wrench
AHX640W Type	CWAHX640WN	LS0622T	TKY15T

★ Clamp Torque (lbf-in) : LS0622T=53

★ : Inventory maintained in Japan.



METRIC Standard

For metric arbors

KAPR :40°
GAMP :-6° T :+10°
GAMF :-4° I :+9°–+10° (T, I : When using the MK breaker insert)

Fig.1 ø80

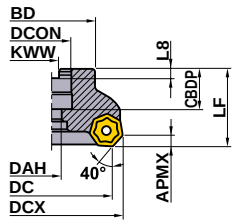


Fig.2 ø100 ø125

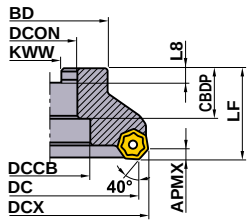


Fig.3 ø160

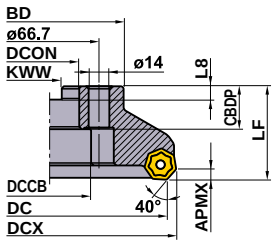
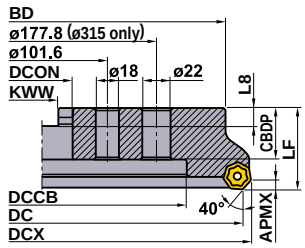


Fig.4 ø200 ø250 ø315



Right hand tool holder shown.

Type	Order Number	Stock R	Stock L	Number of Teeth	Dimensions (mm) DC	DCX	LF	DCON	CBDP	DAH	DCCB	BD	KWW	L8	APMX (mm)	WT * (kg)	Type (Fig.)
Extra Fine Pitch	**AHX640W-080A08R/L**	★	★	8	80	92.6	50	27	23	13	–	56	12.4	7	6	1.5	1
	AHX640W**-100B10R/L**	★	★	10	100	112.6	50	32	32	–	45	70	14.4	8	6	2.1	2
	AHX640W**-125B12R/L**	★	★	12	125	137.6	63	40	32	–	56	80	16.4	9	6	3.1	2
	AHX640W**-160C16R/L**	★	★	16	160	172.6	63	40	29	–	56	100	16.4	9	6	5.6	3
	AHX640W**-200C20R/L**	★	★	20	200	212.6	63	60	32	–	135	155	25.7	14	6	8.0	4
	AHX640W**-250C24R/L**	★	★	24	250	262.6	63	60	32	–	180	200	25.7	14	6	12.6	4
	AHX640W**-315C28R/L**	★	★	28	315	327.6	80	60	57	–	225	285	25.7	14	6	31.5	4
Super Extra Fine Pitch	**AHX640W-080A10R/L**	★	★	10	80	92.6	50	27	23	13	–	56	12.4	7	6	1.5	1
	AHX640W**-100B14R/L**	★	★	14	100	112.6	50	32	32	–	45	70	14.4	8	6	2.1	2
	AHX640W**-125B18R/L**	★	★	18	125	137.6	63	40	32	–	56	80	16.4	9	6	3.1	2
	AHX640W**-160C22R/L**	★	★	22	160	172.6	63	40	29	–	56	100	16.4	9	6	5.6	3
	AHX640W**-200C28R/L**	★	★	28	200	212.6	63	60	32	–	135	155	25.7	14	6	8.0	4
	AHX640W**-250C36R/L**	★	★	36	250	262.6	63	60	32	–	180	200	25.7	14	6	12.6	4
	AHX640W**-315C44R/L**	★	★	44	315	327.6	80	60	57	–	225	285	25.7	14	6	31.5	4

1) ★ WT : Mass
2) Set bolt not included.

RECOMMENDED CUTTING CONDITION

GENERAL CUTTING

	Work Material	Tensile Strength	Grade	Cutting Speed (SFM)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤350MPa	**MC5020**	720 (490–985)	.012 (.008–.016)
			VP15TF VP20RT	590 (425–755)	.012 (.008–.016)
	Ductile Cast Iron	≤450MPa	**MC5020**	655 (490–820)	.008 (.004–.012)
			VP15TF VP20RT	560 (395–720)	.008 (.004–.012)
		≤800MPa	**MC5020**	560 (490–655)	.008 (.004–.012)
			VP15TF VP20RT	460 (330–590)	.008 (.004–.012)

★ Please use 2-3 pcs of Wiper inserts in case of 'over .236 IPR'.

FINISHING (USE OF WIPER INSERTS)

	Work Material	Grade	Axial Depth of Cut (inch)	Cutting Speed (SFM)	Feed per Tooth (IPT)
K	Gray Cast Iron	**MC5020**	< .0197	1050 (820–1310)	.008 (.004–.012)
			.0197–.118	885 (655–1150)	
	Ductile Cast Iron		< .0197	885 (655–1150)	
			.0197–.118	720 (655–820)	

INSERTS ➤ K029
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

FACE MILLING 45°

<HIGH EFFICIENCY CUTTING FOR CAST IRON>

Finishing Roughing

AOX445

P M **K** N S H



- Octagonal double-sided solid CBN insert.
- Economical 16 corner use. (when depth of cut is 3mm)
- High efficiency machining from roughing to finishing.
- Easy operation and cleaning.

Fig.1 ø63

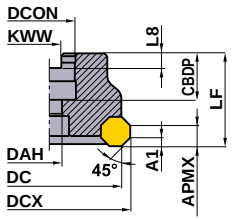
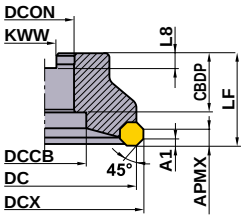


Fig.2 ø80 ø100 ø125 ø160



METRIC Standard

For inch arbors

KAPR :45°
GAMP :-5° T :-9°—-6°
GAMF :-9°—-6° I :-5°

ARBOR TYPE

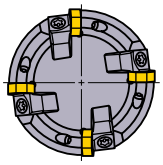
Right hand tool holder only.

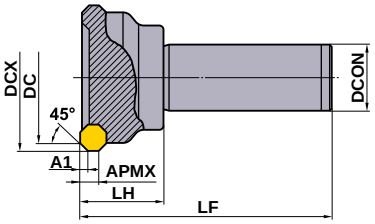
Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) [inch] DC	DCX	LF	DCON	CBDP	DAH	DCCB	KWW	L8	* WT (kg)	Max. Depth of Cut (mm) A1	APMX	Max. Spindle Speed (min-1)	Type (Fig.)
Coarse Pitch	AOX445-063A04R	★	4	63	70.75	40	22	20	11	—	10.4	6.3	0.6	3	8	12000	1
	AOX445-R08006C	★	6	80	87.73	50	25.4 [1.0"]	26	—	38	9.5	6	1.2	3	8	11000	2
	AOX445-R10008D	★	8	100	107.73	50	31.75 [1.25"]	32	—	45	12.7	8	1.8	3	8	9300	2
	AOX445-R12510E	★	10	125	132.71	63	38.1 [1.5"]	35	—	60	15.9	10	3.0	3	8	8300	2
	AOX445-R16012F	★	12	160	167.71	63	50.8 [2.0"]	38	—	80	19.1	11	4.9	3	8	7200	2

(Note) When machining with a depth of cut of over 3mm, 16 corners cannot be used.

★ WT : Mass







METRIC Standard

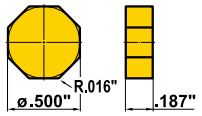
SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	DCX	LF	DCON	LH	* WT (kg)	Max. Depth of Cut (mm) A1	APMX	Max. Spindle Speed (min-1)
Coarse Pitch	AOX445R503S32	★	3	50	57.75	125	32	40	1.1	3	8	13000
	AOX445R634S32	★	4	63	70.75	125	32	40	1.4	3	8	12000

★ WT : Mass

INSERTS

Order Number	Class	CBN BC5030	Geometry
SL-ONEN120404ASN	E	★	

SPARE PARTS

Tool Holder Number	Wedge	* Clamp Screw	Wrench
AOX445	CWAOX445N	LS15T	TKY25T

★ Clamp Torque (lbf-in) : LS15T=71

RECOMMENDED CUTTING CONDITIONS

	Work Material	Tensile Strength	Grade	Cutting Speed (SFM)	Feed per Tooth (inch/tooth)
K	Gray Cast Iron	≤200MPa	BC5030	3280 (2625—4920)	.004 (.002—.006)
		250—350 MPa			

★ : Inventory maintained in Japan.
<1 insert in one case for CBN>

SHOULDER MILLING

<STRONG EDGE TYPE FOR CAST IRON>

Roughing

VOX400

P M **K** N S H



Fig.1

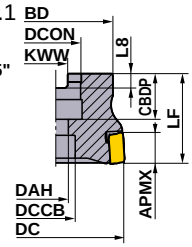


Fig.2

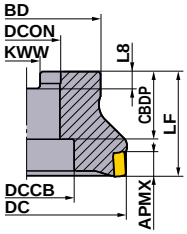
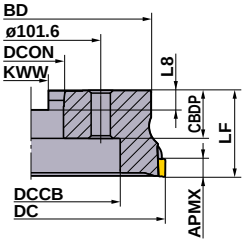


Fig.3



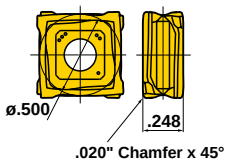
Right hand tool holder only.

ARBOR TYPE

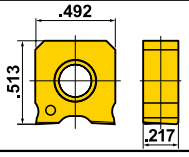
Type	Order Number	Stock	Number of Teeth	Dimensions (inch)									* WT (lbs)	APMX (inch)	Type (Fig.)
		R		DC	LF	DCON	CBDP	DAH	DCCB	BD	KWW	L8			
Coarse Pitch	**VOX400UR0203C**	●	3	2.000	2.000	1.000	1.339	.539	.787	1.93	.375	.219	.8	.394	1
	VOX400UR**2504C**	●	4	2.500	2.000	1.000	1.339	.539	.787	2.19	.375	.219	1.7	.394	1
	VOX400UR**0304C**	●	4	3.000	2.000	1.000	1.339	.539	.787	2.19	.375	.219	2.2	.394	1
	VOX400UR**0406E**	●	6	4.000	2.000	1.500	1.024	—	2.205	3.81	.625	.375	4.3	.394	2
	VOX400UR**0508E**	●	8	5.000	2.000	1.500	1.024	—	2.205	3.81	.625	.375	6.0	.394	2
	VOX400UR**0610F**	●	10	6.000	2.500	2.000	1.024	—	3.228	4.88	.750	.437	10.2	.394	2
	VOX400UR**0812M**	●	12	8.000	2.500	2.500	1.378	—	5.512	6.89	1.000	.560	17.6	.394	3
	VOX400UR**1016M**	●	16	10.000	2.500	2.500	1.378	—	7.078	8.66	1.000	.560	29.4	.394	3
Fine Pitch	**VOX400UR0205C**	●	5	2.000	2.000	1.000	1.339	.539	.787	1.93	.375	.219	.8	.394	1
	VOX400UR**2506C**	●	6	2.500	2.000	1.000	1.339	.539	.787	2.19	.375	.219	1.7	.394	1
	VOX400UR**0308C**	●	8	3.000	2.000	1.000	1.339	.539	.787	2.19	.375	.219	2.2	.394	1
	VOX400UR**0410E**	●	10	4.000	2.000	1.500	1.024	—	2.205	3.81	.625	.375	4.3	.394	2
	VOX400UR**0512E**	●	12	5.000	2.000	1.500	1.024	—	2.205	3.81	.625	.375	6.0	.394	2
	VOX400UR**0616F**	●	16	6.000	2.500	2.000	1.024	—	3.228	4.88	.750	.437	10.2	.394	2
	VOX400UR**0820M**	●	20	8.000	2.500	2.500	1.378	—	5.512	6.89	1.000	.560	17.6	.394	3
	VOX400UR**1024M**	●	24	10.000	2.500	2.500	1.378	—	7.078	8.66	1.000	.560	29.4	.394	3
Extra Fine Pitch	**VOX400UR2508C**	●	8	2.500	2.000	1.000	1.024	.539	.787	2.19	.375	.219	1.5	.394	1
	VOX400UR**0310C**	●	10	3.000	2.000	1.000	1.024	.539	.787	2.19	.375	.219	2.0	.394	1
	VOX400UR**0412E**	●	12	4.000	2.000	1.500	1.024	—	2.205	3.81	.625	.375	4.1	.394	2
	VOX400UR**0516E**	●	16	5.000	2.000	1.500	1.024	—	2.205	3.81	.625	.375	5.6	.394	2
	VOX400UR**0620F**	●	20	6.000	2.500	2.000	1.024	—	3.228	4.88	.750	.437	9.8	.394	2
	VOX400UR**0826M**	●	26	8.000	2.500	2.500	1.378	—	5.512	6.89	1.000	.560	17.1	.394	3
	VOX400UR**1034M**	●	34	10.000	2.500	2.500	1.378	—	7.087	8.66	1.000	.560	28.7	.394	3

1) ∗ WT : Mass
2) Set bolt not included.

INSERTS

Shape	Order Number	Class	Horning	Coated MC5020	Coated VP15TF	Geometry (inch)
	**SONX1206PER**	N	E	●	●	

WIPER INSERTS

Shape	Order Number	Class	Horning	Coated MC5020	Coated VP15TF	Geometry (inch)
	**WOEX1206PER5C**	E	E		●	

● : Inventory maintained.
<10 inserts in one case>

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig.1

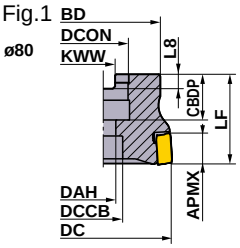


Fig.2

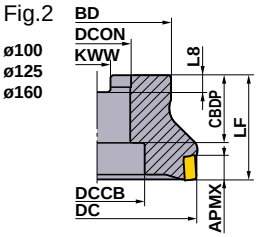
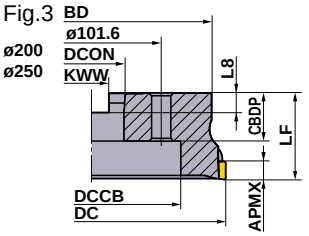


Fig.3



Right hand tool holder only.

METRIC Standard

For inch arbors

ARBOR TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (mm) [inch]									WT (kg) *	APMX (mm)	Type (Fig.)
		R		DC	LF	DCON	CBDP	DAH	DCCB	BD	KWW	L8			
Coarse Pitch	VOX400R08004C	★	4	80	50	25.4 [1.0"]	26	13	20	55	9.5	6	1.0	10	1
	VOX400R10006D	★	6	100	50	31.75 [1.25"]	32	—	45	70	12.7	8	1.5	10	2
	VOX400R12508E	★	8	125	63	38.1 [1.5"]	40	—	60	80	15.9	10	2.7	10	2
	VOX400R16010F	★	10	160	63	50.8 [2.0"]	43	—	80	120	19.1	11	5.3	10	2
	VOX400R20012K	★	12	200	63	47.625 [1.875"]	35	—	130	175	25.4	14.22	8.5	10	3
	VOX400R25016K	★	16	250	63	47.625 [1.875"]	35	—	180	220	25.4	14.22	13.3	10	3
Fine Pitch	VOX400R08008C	★	8	80	50	25.4 [1.0"]	26	13	20	55	9.5	6	1.0	10	1
	VOX400R10010D	★	10	100	50	31.75 [1.25"]	32	—	45	70	12.7	8	1.5	10	2
	VOX400R12512E	★	12	125	63	38.1 [1.5"]	40	—	60	80	15.9	10	2.7	10	2
	VOX400R16016F	★	16	160	63	50.8 [2.0"]	43	—	80	120	19.1	11	5.3	10	2
	VOX400R20020K	★	20	200	63	47.625 [1.875"]	35	—	130	175	25.4	14.22	8.5	10	3
	VOX400R25024K	★	24	250	63	47.625 [1.875"]	35	—	180	220	25.4	14.22	13.3	10	3
Extra Fine Pitch	VOX400R08010C	★	10	80	50	25.4 [1.0"]	26	13	20	55	9.5	6	1.0	10	1
	VOX400R10012D	★	12	100	50	31.75 [1.25"]	32	—	45	70	12.7	8	1.4	10	2
	VOX400R12516E	★	16	125	63	38.1 [1.5"]	40	—	60	80	15.9	10	2.6	10	2
	VOX400R16020F	★	20	160	63	50.8 [2.0"]	43	—	80	120	19.1	11	5.1	10	2
	VOX400R20026K	★	26	200	63	47.625 [1.875"]	35	—	130	175	25.4	14.22	8.2	10	3
	VOX400R25034K	★	34	250	63	47.625 [1.875"]	35	—	180	220	25.4	14.22	13.0	10	3

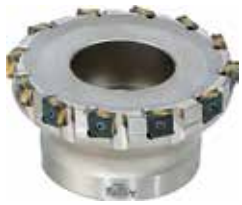
1) ★ WT : Mass
2) Set bolt not included.

SPARE PARTS

Tool Holder Number	 * Clamp Screw	 Wrench
VOX400	CS401160T	TKY15T

★ Clamp Torque (lbf-in) : CS401160T=31

★ : Inventory maintained in Japan.



METRIC Standard

For metric arbors

Fig.1

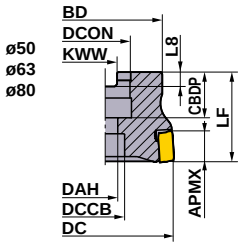
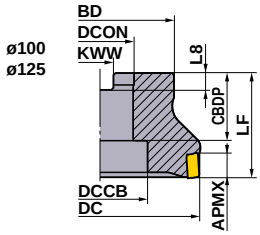
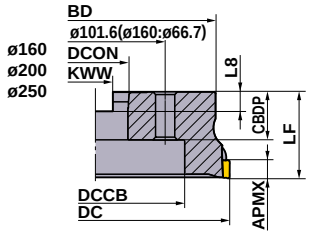


Fig.2



Right hand tool holder only.

Fig.3



ARBOR TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)									WT (kg) *	APMX (mm)	Type (Fig.)
		R		DC	LF	DCON	CBDP	DAH	DCCB	BD	KWW	L8			
Coarse Pitch	**VOX400-050A03R**	★	3	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1
	VOX400**-063A04R**	★	4	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1
	VOX400**-080A04R**	★	4	80	50	27	23	13	20	56	12.4	7	1	10	1
	VOX400**-100B06R**	★	6	100	50	32	32	—	45	78	14.4	8	1.7	10	2
	VOX400**-125B08R**	★	8	125	63	40	32	—	56	89	16.4	9	3	10	2
	VOX400**-160C10R**	★	10	160	63	40	29	—	56	120	16.4	9	5.4	10	3
	VOX400**-200C12R**	★	12	200	63	60	32	—	130	175	25.7	14.22	8.1	10	3
	VOX400**-250C16R**	★	16	250	63	60	32	—	180	210	25.7	14.22	11.8	10	3
Fine Pitch	**VOX400-050A05R**	★	5	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1
	VOX400**-063A06R**	★	6	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1
	VOX400**-080A08R**	★	8	80	50	27	23	13	20	56	12.4	7	1	10	1
	VOX400**-100B10R**	★	10	100	50	32	32	—	45	78	14.4	8	1.7	10	2
	VOX400**-125B12R**	★	12	125	63	40	32	—	56	89	16.4	9	3	10	2
	VOX400**-160C16R**	★	16	160	63	40	29	—	56	120	16.4	9	5.4	10	3
	VOX400**-200C20R**	★	20	200	63	60	32	—	130	175	25.7	14.22	8.1	10	3
	VOX400**-250C24R**	★	24	250	63	60	32	—	180	210	25.7	14.22	11.8	10	3
Extra Fine Pitch	**VOX400-063A08R**	★	8	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1
	VOX400**-080A10R**	★	10	80	50	27	23	13	20	56	12.4	7	1.0	10	1
	VOX400**-100B12R**	★	12	100	50	32	32	—	45	78	14.4	8	1.6	10	2
	VOX400**-125B16R**	★	16	125	63	40	32	—	56	89	16.4	9	2.8	10	2
	VOX400**-160C20R**	★	20	160	63	40	29	—	56	120	16.4	9	5.2	10	3
	VOX400**-200C26R**	★	26	200	63	60	32	—	130	175	25.7	14.22	7.9	10	3
	VOX400**-250C34R**	★	34	250	63	60	32	—	180	210	25.7	14.22	11.5	10	3

1) ★ WT : Mass
2) Set bolt not included.

INSERTS ➤ K033
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

VOX400 (Standard pitch)

Work Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ2"—ϕ10"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	MC5020	985(820—1150)	≤DC	≤.394	.016(.012—.020)
			VP15TF	820(655—985)	≤DC	≤.394	.016(.012—.020)
		≤350MPa	MC5020	720(490—985)	≤DC	≤.394	.012(.008—.016)
			VP15TF	655(490—985)	≤DC	≤.394	.012(.008—.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490—820)	≤DC	≤.394	.012(.008—.016)
			VP15TF	555(490—655)	≤DC	≤.394	.012(.008—.016)
		≤800MPa	MC5020	555(490—655)	≤DC	≤.394	.008(.004—.012)
			VP15TF	490(330—655)	≤DC	≤.394	.008(.004—.012)

VOX400 (Fine pitch)

Work Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ2.5"			ϕ3"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	MC5020	985(820—1150)	≤DC	≤.394	.016(.012—.020)	≤DC	≤.394	.016(.012—.020)
			VP15TF	820(655—985)	≤DC	≤.394	.016(.012—.020)	≤DC	≤.394	.016(.012—.020)
		≤350MPa	MC5020	720(490—985)	≤DC	≤.394	.012(.008—.016)	≤DC	≤.394	.012(.008—.016)
			VP15TF	655(490—985)	≤DC	≤.394	.012(.008—.016)	≤DC	≤.394	.012(.008—.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490—820)	≤0.8DC	≤.394	.012(.008—.016)	≤0.6DC	≤.394	.012(.008—.016)
			VP15TF	555(490—655)	≤0.8DC	≤.394	.012(.008—.016)	≤0.6DC	≤.394	.012(.008—.016)
		≤800MPa	MC5020	555(490—655)	≤0.8DC	≤.394	.008(.004—.012)	≤0.6DC	≤.394	.008(.004—.012)
			VP15TF	490(330—655)	≤0.8DC	≤.394	.008(.004—.012)	≤0.6DC	≤.394	.008(.004—.012)

Work Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ4"			ϕ5"		
					Radial depth of cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	MC5020	985(820—1150)	≤DC	≤.394	.016(.012—.020)	≤DC	≤.394	.016(.012—.020)
			VP15TF	820(655—985)	≤DC	≤.394	.016(.012—.020)	≤DC	≤.394	.016(.012—.020)
		≤350MPa	MC5020	720(490—985)	≤DC	≤.394	.012(.008—.016)	≤DC	≤.394	.012(.008—.016)
			VP15TF	655(490—985)	≤DC	≤.394	.012(.008—.016)	≤DC	≤.394	.012(.008—.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490—820)	≤0.5DC	≤.394	.012(.008—.016)	≤0.4DC	≤.394	.012(.008—.016)
			VP15TF	555(490—655)	≤0.5DC	≤.394	.012(.008—.016)	≤0.4DC	≤.394	.012(.008—.016)
		≤800MPa	MC5020	555(490—655)	≤0.5DC	≤.394	.008(.004—.012)	≤0.4DC	≤.394	.008(.004—.012)
			VP15TF	490(330—655)	≤0.5DC	≤.394	.008(.004—.012)	≤0.4DC	≤.394	.008(.004—.012)

Work Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ6"			ϕ8", ϕ10"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	MC5020	985(820—1150)	≤DC	≤.394	.016(.012—.020)	≤DC	≤.394	.016(.012—.020)
			VP15TF	820(655—985)	≤DC	≤.394	.016(.012—.020)	≤DC	≤.394	.016(.012—.020)
		≤350MPa	MC5020	720(490—985)	≤DC	≤.394	.012(.008—.016)	≤DC	≤.394	.012(.008—.016)
			VP15TF	655(490—985)	≤DC	≤.394	.012(.008—.016)	≤DC	≤.394	.012(.008—.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490—820)	≤0.3DC	≤.394	.012(.008—.016)	≤0.2DC	≤.394	.012(.008—.016)
			VP15TF	555(490—655)	≤0.3DC	≤.394	.012(.008—.016)	≤0.2DC	≤.394	.012(.008—.016)
		≤800MPa	MC5020	555(490—655)	≤0.3DC	≤.394	.008(.004—.012)	≤0.2DC	≤.394	.008(.004—.012)
			VP15TF	490(330—655)	≤0.3DC	≤.394	.008(.004—.012)	≤0.2DC	≤.394	.008(.004—.012)

- DC is cutter diameter.
- When using wiper insert, please reduce the feed per tooth to half the normal rate.

VOX400 (Extra fine pitch)

	Work Material	Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ2.5"			ϕ3"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	MC5020	985(820－1150)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
			VP15TF	820(655－985)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
		≤350MPa	MC5020	720(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
			VP15TF	655(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490－820)	≤0.6DC	≤.394	.012(.008－.016)	≤0.5DC	≤.394	.012(.008－.016)
			VP15TF	555(490－655)	≤0.6DC	≤.394	.012(.008－.016)	≤0.5DC	≤.394	.012(.008－.016)
		≤800MPa	MC5020	555(490－655)	≤0.6DC	≤.394	.008(.004－.012)	≤0.5DC	≤.394	.008(.004－.012)
			VP15TF	490(330－655)	≤0.6DC	≤.394	.008(.004－.012)	≤0.5DC	≤.394	.008(.004－.012)

	Work Material	Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ4"			ϕ5"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	MC5020	985(820－1150)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
			VP15TF	820(655－985)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
		≤350MPa	MC5020	720(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
			VP15TF	655(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490－820)	≤0.4DC	≤.394	.012(.008－.016)	≤0.3DC	≤.394	.012(.008－.016)
			VP15TF	555(490－655)	≤0.4DC	≤.394	.012(.008－.016)	≤0.3DC	≤.394	.012(.008－.016)
		≤800MPa	MC5020	555(490－655)	≤0.4DC	≤.394	.008(.004－.012)	≤0.3DC	≤.394	.008(.004－.012)
			VP15TF	490(330－655)	≤0.4DC	≤.394	.008(.004－.012)	≤0.3DC	≤.394	.008(.004－.012)

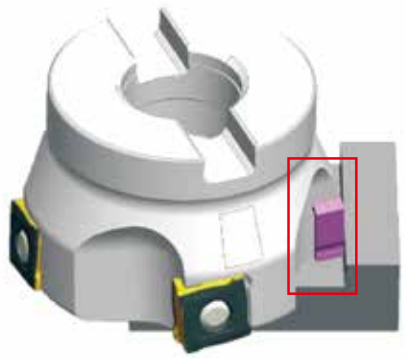
	Work Material	Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ6"			ϕ8", ϕ10"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	MC5020	985(820－1150)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
			VP15TF	820(655－985)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
		≤350MPa	MC5020	720(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
			VP15TF	655(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490－820)	≤0.25DC	≤.394	.012(.008－.016)	≤0.15DC	≤.394	.012(.008－.016)
			VP15TF	555(490－655)	≤0.25DC	≤.394	.012(.008－.016)	≤0.15DC	≤.394	.012(.008－.016)
		≤800MPa	MC5020	555(490－655)	≤0.25DC	≤.394	.008(.004－.012)	≤0.15DC	≤.394	.008(.004－.012)
			VP15TF	490(330－655)	≤0.25DC	≤.394	.008(.004－.012)	≤0.15DC	≤.394	.008(.004－.012)

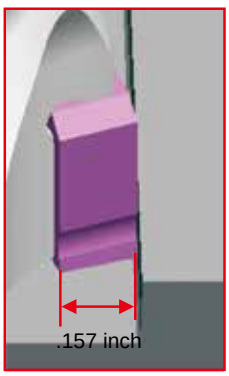
- DC is cutter diameter.
- When using wiper insert, please reduce the feed per tooth to half the normal rate.

Usable cutting edge width of wiper inserts

The width of the wiper insert itself is .217 inch, however the actual functioning cutting edge width after installation to the body is .177 inch, as shown in the diagram.

With one wiper insert, it is possible to machine up to fr=.157 inch feed per revolution. When exceeding fr=.157 inch, use two or more wiper inserts. Note that there is a possibility to exceed fr=.157 inch when using a holder with more than 24 inserts.





SHOULDER MILLING
<GENERAL CUTTING>

Finishing Roughing

ASX400

P M K N S H



- Economical due to the use of 4 cutting edges.
- Low resistance due to the 3D design of the curved cutting edge.
- Curved cutting edge and high rigidity holder.

KAPR :0°
GAMP :+11° T :-9°–-11°
GAMF :-9°–-11° I :+11°

Fig.1
ø2"
ø2-1/2"

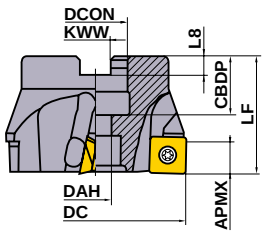


Fig.2
ø3"
ø4"
ø5"
ø6"

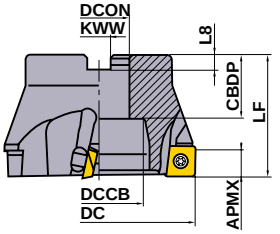
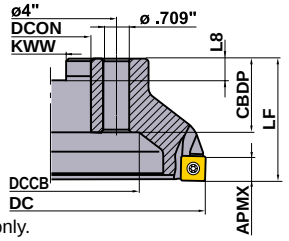


Fig.3
ø4"
ø8"
ø10"



Right hand tool holder only.

ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	LF	DCON	CBDP	DAH	DCCB	KWW	L8	APMX (inch)	WT* (lbs)	Type (Fig.)
Coarse Pitch	**ASX400R0203**	●	3	2.000	1.575	.750	.748	.415	–	.313	.187	.394	.8	1
	ASX400R**2504**	●	4	2.500	1.575	.750	.748	.415	–	.313	.187	.394	1.1	1
	ASX400R**0304C**	●	4	3.000	1.969	1.000	1.024	–	1.496	.375	.219	.394	2.2	2
	ASX400R**0405E**	●	5	4.000	1.969	1.500	1.378	–	2.362	.625	.375	.394	3.3	2
	ASX400R**0506E**	●	6	5.000	2.480	1.500	1.378	–	2.362	.625	.375	.394	5.5	2
	ASX400R**0608E**	●	8	6.000	2.480	1.500	1.378	–	2.362	.625	.375	.394	8.8	2
	ASX400R**0810M**	●	10	8.000	2.480	2.500	1.378	–	5.315	1.000	.560	.394	15.0	3
	ASX400R**1012M**	●	12	10.000	2.480	2.500	1.378	–	7.087	1.000	.560	.394	26.0	3
Fine Pitch	**ASX400R0204**	●	4	2.000	1.575	.750	.748	.415	–	.313	.187	.394	.8	1
	ASX400R**2505**	●	5	2.500	1.575	.750	.748	.415	–	.313	.187	.394	1.1	1
	ASX400R**0306C**	●	6	3.000	1.969	1.000	1.024	–	1.496	.375	.219	.394	2.2	2
	ASX400R**0407E**	●	7	4.000	1.969	1.500	1.378	–	2.362	.625	.375	.394	3.3	2
	ASX400R**0508E**	●	8	5.000	2.480	1.500	1.378	–	2.362	.625	.375	.394	5.5	2
	ASX400R**0612E**	●	12	6.000	2.480	1.500	1.378	–	2.362	.625	.375	.394	8.8	2
	ASX400R**0816M**	●	16	8.000	2.480	2.500	1.378	–	5.315	1.000	.560	.394	15.0	3
	ASX400R**1018M**	●	18	10.000	2.480	2.500	1.378	–	7.087	1.000	.560	.394	26.0	3
Extra Fine Pitch	**ASX400R0205**	●	5	2.000	1.575	.750	.748	.415	–	.313	.187	.394	.8	1
	ASX400R**2506**	●	6	2.500	1.575	.750	.748	.415	–	.313	.187	.394	1.1	1
	ASX400R**0308C**	●	8	3.000	1.969	1.000	1.024	–	1.496	.375	.219	.394	2.2	2
	ASX400R**0410E**	●	10	4.000	1.969	1.500	1.378	–	2.362	.625	.375	.394	3.3	2
	ASX400R**0512E**	●	12	5.000	2.480	1.500	1.378	–	2.362	.625	.375	.394	5.5	2
	ASX400R**0615E**	●	15	6.000	2.480	1.500	1.378	–	2.362	.625	.375	.394	8.8	2
	ASX400R**0819M**	●	19	8.000	2.480	2.500	1.378	–	5.315	1.000	.560	.394	15.0	3
	ASX400R**1022M**	●	22	10.000	2.480	2.500	1.378	–	7.087	1.000	.560	.394	26.0	3

1) ∗ WT : Mass
2) Set bolt not included.

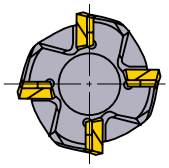
SPARE PARTS

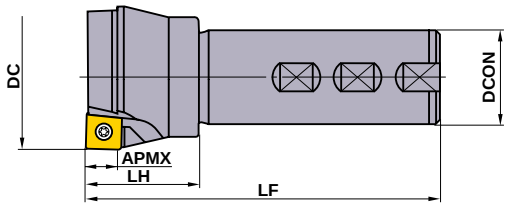
Tool Holder Number	Shim	Shim Screw *	Insert Screw *	Wrench (Insert)	Wrench (Shim)	Insert
ASX400R Type	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	SO○T12T3○○ PE○R-○○

∗ Clamp Torque (lbf-in) : WCS503507H=44, TPS35=31

● **: Inventory maintained.**
<10 inserts in one case>







WELDON SHANK TYPE

Right hand tool holder only.

Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	LF	DCON	LH	APMX	Shim	Shim Screw *	Insert Screw *	Wrench (Insert)	Wrench (Shim)	Insert
ASX400R202W20	●	2	1.250	4.750	1.250	1.500	.394	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	SO○T12T3○○ PE○R-○○
ASX400R243W20	●	3	1.500	4.750	1.250	1.500	.394	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	
ASX400R324W20	●	4	2.000	4.750	1.250	1.575	.394	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	

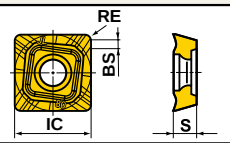
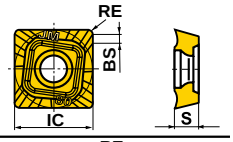
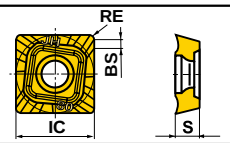
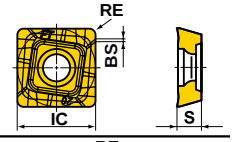
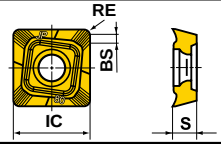
* Clamp Torque (lbf-in) : WCS503507H=44, TPS35=31

INSERTS

Work Material	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-ferrous Metal
S	Heat-resistant Alloy, Titanium Alloy
H	Hardened Steel

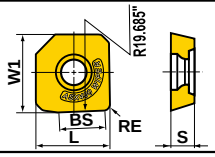
Cutting Conditions :
● : Stable Cutting ◔ : General Cutting
✱ : Unstable Cutting

Honing :
E : Round **F** : Sharp **T** : Chamfer

Application	Shape	Order Number	Class	Honing	Coated F7010	F7030	MC5020	MP6120 NEW	MP6130 NEW	MP7130 NEW	MP7140 NEW	MP9120 NEW	MP9130 NEW	VP15TF	VP30RT	Cermet NX4545		Carbide HTi10		Dimensions (inch) IC	S	BS	RE	Geometry
Finish—Light Cutting	**JL** Breaker	**SOET12T308PEER-JL**	E	E		●		●	●	●	●	●	●	●	●	●				.500	.156	.055	.031	
Light—Rough Cutting	**JM** Breaker	**SOMT12T308PEER-JM**	M	E	●	●	●	●	●	●	●	●	●	●	●	●				.500	.156	.055	.031	
Medium—Heavy Cutting	**JH** Breaker	**SOMT12T308PEER-JH**	M	E		●	●	●	●	●	●	●	●	●	●					.500	.156	.055	.031	
Heavy Interrupted Cutting	**FT** Breaker	**SOMT12T320PEER-FT**	M	E			●	●				●	●	●						.500	.156	.055	.079	
For Aluminium Alloy	**JP** Breaker	**SOGT12T308PEFR-JP**	G	F														●		.500	.156	.055	.031	

WIPER INSERTS

= MIRACLE SIGMA

Shape	Order Number	Class	Honing	Carbide HTi05T		Cermet NX2525		Dimensions (inch) L	W1	S	BS	RE	Geometry
	**WOEW12T308PEER8C**	E	E	●				.492	.520	.156	.315	.031	
	WOEW12T308PETR8C	E	T			●		.492	.520	.156	.315	.031	

MILLING

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig.1
ø80
ø100
ø125
ø160

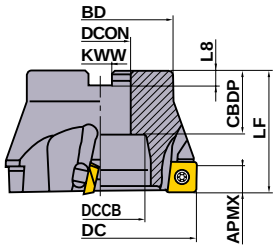
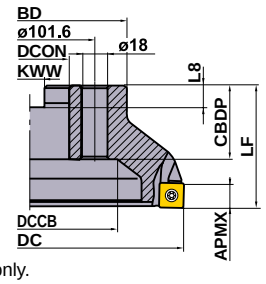


Fig.2
ø200
ø250



Right hand tool holder only.

METRIC Standard

For inch arbors

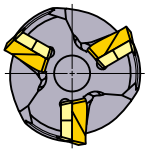
KAPR :0°
GAMP :+11° T :-9°—-11°
GAMF :-9°—-11° I :+11°

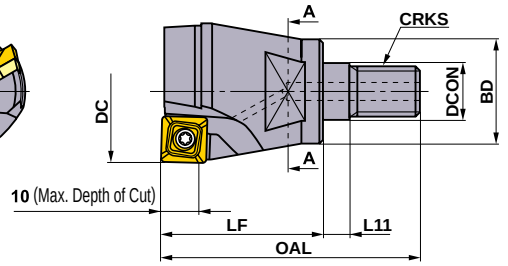
ARBOR TYPE

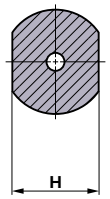
Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) [inch] DC	LF	DCON	CBDP	DCCB	BD	KWW	L8	APMX (mm)	WT * (kg)	Type (Fig.)
Coarse Pitch	**ASX400R08004C**	★	4	80	50	25.4 [1.0"]	26	38	60	9.5	6	10	1.0	1
	ASX400**R10005D**	★	5	100	50	31.75 [1.25"]	32	45	70	12.7	8	10	1.5	1
	ASX400**R12506E**	★	6	125	63	38.1 [1.5"]	35	60	80	15.9	10	10	2.5	1
	ASX400**R16008F**	★	8	160	63	50.8 [2.0"]	38	90	100	19.1	11	10	4.0	1
	ASX400**R20010K**	★	10	200	63	47.625 [1.875"]	35	135	160	25.4	14.22	10	7.0	2
	ASX400**R25012K**	★	12	250	63	47.625 [1.875"]	35	180	210	25.4	14.22	10	12.0	2
Fine Pitch	**ASX400R08006C**	★	6	80	50	25.4 [1.0"]	26	38	60	9.5	6	10	1.0	1
	ASX400**R10007D**	★	7	100	50	31.75 [1.25"]	32	45	70	12.7	8	10	1.5	1
	ASX400**R12508E**	★	8	125	63	38.1 [1.5"]	35	60	80	15.9	10	10	2.5	1
	ASX400**R16012F**	★	12	160	63	50.8 [2.0"]	38	90	100	19.1	11	10	4.0	1
	ASX400**R20016K**	★	16	200	63	47.625 [1.875"]	35	135	160	25.4	14.22	10	7.0	2
	ASX400**R25018K**	★	18	250	63	47.625 [1.875"]	35	180	210	25.4	14.22	10	12.0	2

1) ★ WT : Mass
2) Set bolt not included.









METRIC Standard

SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock R	★3 Coolant Thru	Number of Teeth	Dimensions (mm) DC	DCON	BD	OAL	LF	L11	H	★2 CRKS	★4 WT (kg)	Shim	★1 Shim Screw	★1 Insert Screw	Wrench (Insert)	Wrench (Shim)
ASX400R322AM1640	★	Y	2	32	17	29	63	40	6	24	M16	0.3	—	WCS503507H	TPS35	TIP15T	HKY35R
ASX400R**403AM1645**	★	Y	3	40	17	29	68	45	6	24	M16	0.3	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R

★1 Clamp Torque (lbf-in) : WCS503507H=44, TPS35=31
★2 Clamp Torque of the Head (lbf-ft) : M16=66.7
★3 Y=Yes
★4 WT : Mass

★ : Inventory maintained in Japan.



Fig.1 ø50 ø63

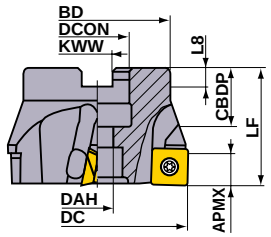


Fig.2 ø80 ø100 ø125

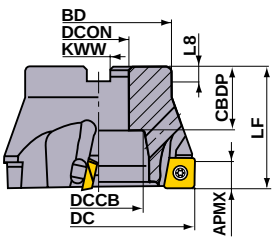


Fig.3 ø160

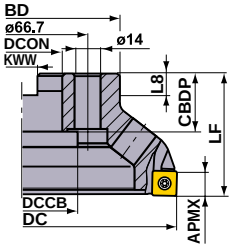
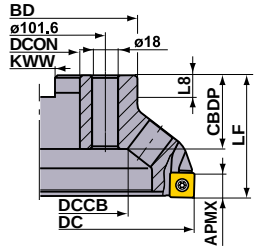


Fig.4 ø200 ø250



METRIC Standard

For metric arbors

KAPR :0°
GAMP :+11° T :-9°—-11°
GAMF :-9°—-11° I :+11°

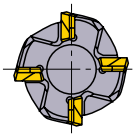
Right hand tool holder only.

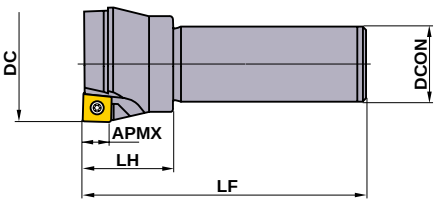
ARBOR TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)									APMX (mm)	WT* (kg)	Type (Fig.)
		R		DC	LF	DCON	CBDP	DAH	DCCB	BD	KWW	L8			
Coarse Pitch	ASX400-050A03R	★	3	50	40	22	20	11	—	41	10.4	6.3	10	0.3	1
	ASX400-063A04R	★	4	63	40	22	20	11	—	50	10.4	6.3	10	0.5	1
	ASX400-080B04R	★	4	80	50	27	29	—	38	60	12.4	7	10	0.9	2
	ASX400-100B05R	★	5	100	50	32	32	—	45	70	14.4	8	10	1.4	2
	ASX400-125B06R	★	6	125	63	40	32	—	60	80	16.4	9	10	2.3	2
	ASX400-160C08R	★	8	160	63	40	29	—	56	100	16.4	9	10	3.6	3
	ASX400-200C10R	★	10	200	63	60	32	—	135	160	25.7	14.22	10	6.3	4
	ASX400-250C12R	★	12	250	63	60	32	—	180	210	25.7	14.22	10	10.8	4
Fine Pitch	ASX400-050A04R	★	4	50	40	22	20	11	—	41	10.4	6.3	10	0.3	1
	ASX400-063A05R	★	5	63	40	22	20	11	—	50	10.4	6.3	10	0.5	1
	ASX400-080B06R	★	6	80	50	27	29	—	38	60	12.4	7	10	0.9	2
	ASX400-100B07R	★	7	100	50	32	32	—	45	70	14.4	8	10	1.4	2
	ASX400-125B08R	★	8	125	63	40	32	—	60	80	16.4	9	10	2.2	2
	ASX400-160C12R	★	12	160	63	40	29	—	56	100	16.4	9	10	3.5	3
	ASX400-200C16R	★	16	200	63	60	32	—	135	160	25.7	14.22	10	6.2	4
	ASX400-250C18R	★	18	250	63	60	32	—	180	210	25.7	14.22	10	10.7	4
Extra Fine Pitch	ASX400-050A05R	★	5	50	40	22	20	11	—	41	10.4	6.3	10	0.3	1
	ASX400-063A06R	★	6	63	40	22	20	11	—	50	10.4	6.3	10	0.5	1
	ASX400-080B08R	★	8	80	50	27	29	—	38	60	12.4	7	10	0.9	2
	ASX400-100B10R	★	10	100	50	32	32	—	45	70	14.4	8	10	1.4	2
	ASX400-125B12R	★	12	125	63	40	32	—	60	80	16.4	9	10	2.1	2
	ASX400-160C15R	★	15	160	63	40	29	—	56	100	16.4	9	10	3.4	3
	ASX400-200C19R	★	19	200	63	60	32	—	135	160	25.7	14.22	10	6.2	4
	ASX400-250C22R	★	22	250	63	60	32	—	180	210	25.7	14.22	10	10.5	4

1) ★ WT : Mass
2) Set bolt not included.







METRIC Standard

SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)					Shim	Shim Screw *	Insert Screw *	Wrench (Insert)	Wrench (Shim)	Insert
		R		DC	LF	DCON	LH	APMX						
Coarse Pitch	ASX400R403S32	★	3	40	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	SO□T12T3□□ PE□R-□□
	ASX400R503S32	★	3	50	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	
	ASX400R634S32	★	4	63	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	
	ASX400R804S32	★	4	80	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	
Fine Pitch	ASX400R504S32	★	4	50	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	SO□T12T3□□ PE□R-□□
	ASX400R635S32	★	5	63	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	
	ASX400R806S32	★	6	80	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	

★ Clamp Torque (lbf-in) : WCS503507H=44, TPS35=31

SCREW-IN ARBORS ➤ K162
INSERTS ➤ K039
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Finish—Light Cutting		Light—Rough Cutting		Medium—Heavy Cutting	
					Feed per Tooth (inch/tooth)	Breaker	Feed per Tooth (inch/tooth)	Breaker	Feed per Tooth (inch/tooth)	Breaker
P	Mild Steel	≤180HB	**F7030**	920 (690—1150)	.007 (.003—.011)	**JL**	.008 (.004—.012)	**JM**	.010 (.008—.014)	**JH**
			MP6120 VP15TF	820 (655—985)	.007 (.003—.011)	**JL**	.008 (.004—.012)	**JM**	.010 (.004—.014)	**JH**
			MP6130	780 (652—950)	.007 (.003—.011)	**JL**	.008 (.004—.012)	**JM**	.010 (.004—.014)	**JH**
			VP30RT	755 (590—920)	.007 (.003—.011)	**JL**	.008 (.004—.012)	**JM**	.010 (.004—.014)	**JH**
			NX4545	590 (425—755)	.006 (.003—.009)	**JL**	.007 (.004—.011)	**JM**	—	—
	Carbon Steel Alloy Steel	180—280HB	**F7030**	820 (655—985)	.006 (.003—.009)	**JL**	.007 (.004—.011)	**JM**	.008 (.004—.012)	**JH**
			MP6120 VP15TF	720 (560—885)	.006 (.003—.009)	**JL**	.007 (.004—.011)	**JM**	.008 (.004—.012)	**JH**
			MP6130	600 (480—740)	.006 (.003—.009)	**JL**	.007 (.004—.011)	**JM**	.008 (.004—.012)	**JH**
			VP30RT	490 (395—590)	.005 (.002—.008)	**JL**	.006 (.004—.010)	**JM**	—	—
			NX4545	490 (390—590)	.005 (.002—.008)	**JL**	.006 (.004—.010)	**JM**	—	—
		280—350HB	**F7030**	590 (425—755)	.005 (.002—.008)	**JL**	.006 (.004—.010)	**JM**	.007 (.004—.011)	**JH**
			MP6120 VP15TF	460 (330—590)	.005 (.002—.008)	**JL**	.006 (.004—.010)	**JM**	.007 (.004—.011)	**JH**
			MP6130	510 (290—560)	.005 (.002—.008)	**JL**	.006 (.004—.010)	**JM**	.007 (.004—.011)	**JH**
			VP30RT	390 (260—525)	.005 (.002—.008)	**JL**	.006 (.004—.010)	**JM**	.007 (.004—.011)	**JH**
			NX4545	330 (260—395)	.004 (.002—.006)	**JL**	.005 (.004—.008)	**JM**	—	—
M	Stainless Steel	≤270HB	**MP7130 VP15TF**	720 (560—885)	.006 (.003—.009)	**JL**	.007 (.004—.011)	**JM**	.008 (.004—.012)	**JH**
			MP7140 VP30RT	490 (395—590)	.006 (.003—.009)	**JL**	.007 (.004—.011)	**JM**	—	—
			NX4545	490 (390—590)	.006 (.003—.009)	**JL**	.007 (.004—.011)	**JM**	—	—
K	Cast Iron Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	655 (490—820)	—	—	.008 (.004—.012)	**JM**	.010 (.004—.014)	**JH FT**
			VP15TF	590 (425—820)	.007 (.004—.011)	**JL**	.008 (.004—.012)	**JM**	.010 (.004—.014)	**JH**
N	Aluminum Alloy	—	**HTi10**	2130 (1000—3300)	.006 (.004—.008)	**JP**	.008 (.004—.012)	**JP**	.012 (.008—.016)	**JP**
S	Titanium Alloy	—	**MP9120 VP15TF**	165 (130—195)	.005 (.002—.008)	**JL**	.006 (.003—.009)	**JM**	—	—
			MP9130	140 (100—180)	.005 (.002—.008)	**JL**	.006 (.003—.009)	**JM**	—	—
	Heat Resistant Alloy	—	**MP9120 VP15TF**	130 (65—165)	.004 (.002—.006)	**JL**	.005 (.003—.008)	**JM**	—	—
			MP9130	110 (55—140)	.004 (.002—.006)	**JL**	.005 (.003—.008)	**JM**	—	—
H	Hardened Steel	40—55HRC	**VP15TF**	200 (120—280)	.003 (.002—.005)	**JL**	.004 (.002—.006)	**JM**	.005 (.003—.007)	**JH**

INSTRUCTIONS FOR USING INSERTS

INSTRUCTIONS FOR USE OF THE JP BREAKER

- The JP breaker has sharp cutting edges. Wear gloves when handling.
- When machining aluminum alloy, welding to the cutting edge tends to occur, often leading to insert failure. To prevent this, wet cutting is recommended.

INSTRUCTIONS FOR USE OF WIPER INSERTS

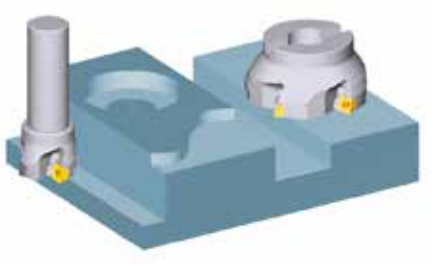


- Wiper inserts for the ASX400 are single-cornered.
- When installing the wiper insert, place the insert so that the small chamfer is located as shown.

FEATURES

ECONOMICAL

ASX400 is economical as it employs inserts that have 4 cutting edges. Additionally with one tool, it is possible to carry out face milling, shoulder milling, and slotting operations.



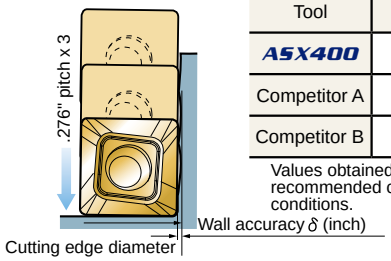
LOW RESISTANCE

Due to the 3D design of the cutting edge and a large rake angle, high cutting edge sharpness has been achieved with reduced cutting resistance.



HIGH ACCURACY

Due to the curved edge and high accuracy body and insert, high accuracy surface finish on walls and high quality surface finish on faces can be achieved.



*JM breaker data

Tool	δ
ASX400	.0012
Competitor A	.0040
Competitor B	.0048

Values obtained under recommended cutting conditions.

EASY TO USE

Employs a screw on type mechanism, therefore, the inserts can be easily set. Additionally when indexing the insert, it is not necessary to remove the screw completely.



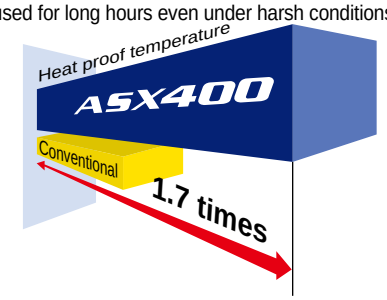
HIGH RELIABILITY

Uses a carbide shim and Mitsubishi's proprietary Anti-Fly-Insert (A.F.I) to prevent the inserts from moving when machining. Additionally the insert screw uses TORXPLUS®, for high clamping force ensuring high reliability.

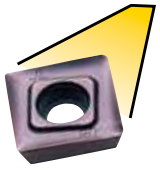
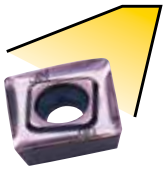
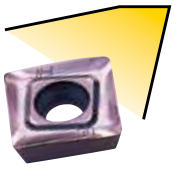
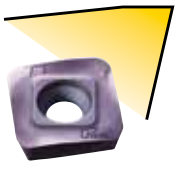


HIGH HEAT-RESISTANT BODY

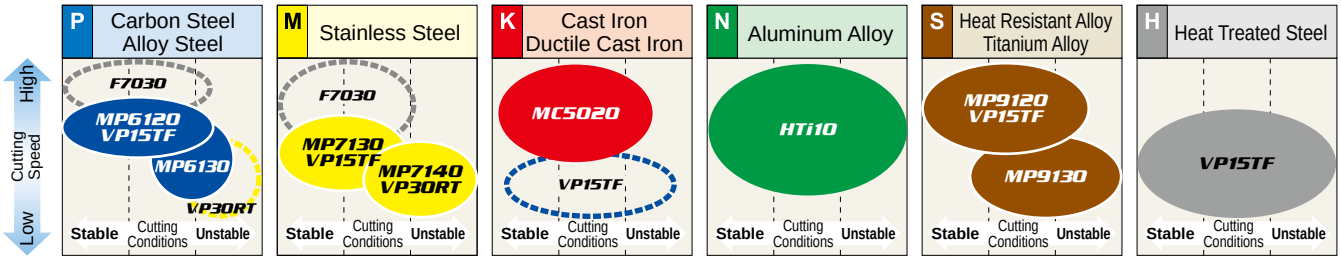
The cutter body is made from a special alloy that provides high strength at high temperatures. A special surface treatment improves the corrosion and friction resistance. The **ASX400** can be used for long hours even under harsh conditions.



CHIPBREAKERS FOR A WIDE RANGE OF APPLICATIONS

JL Finish to Light cutting Breaker	JM Light to Rough Cutting Breaker	JH Medium to Heavy cutting Breaker	FT Heavy cutting/ Heavy interrupted cutting Breaker	JP Aluminum alloy cutting Breaker
				
● High accuracy insert with ground-finished periphery. ● Large rake angle leading to low cutting resistance.	● High accuracy M class insert. ● For a wide range of workpiece materials and cutting conditions.	● High accuracy M class insert. ● Strong cutting edge for high fracture resistance.	● High accuracy M class insert. ● Corner radius of .079" has improved fracture resistance. ● Strong main cutting edge allows heavy cutting and heavy interrupted cutting. Stable cutting performance.	● High accuracy insert with ground-finished periphery. ● Large rake angle and mirror-finished rake face lead to sharp cutting performance and high welding resistance.

INSERT GRADES FOR A WIDE RANGE OF MATERIALS



(Note) When machining steel or stainless steel where the emphasis is on surface finish, use cermet grade NX4545.
Stable Cutting : Continuous cutting, Constant depth of cut, Pre-machined securely clamped component cutting
Unstable Cutting : Heavy interrupted, Irregular depth of cut, Low clamping rigidity cutting

MULTI FUNCTIONAL MILLING

Finishing Roughing

Including Flat faces

APX3000

P M K N S H



- Air / coolant through.
- Low resistance insert and high rigidity body.
- Ideal chip control.
- High wall accuracy can be produced by using this cutter and unique insert geometry.

Fig.1

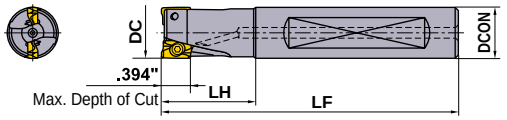


Fig.2

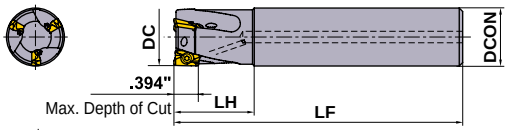


Fig.3

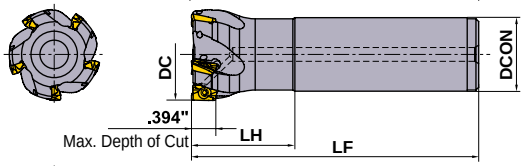
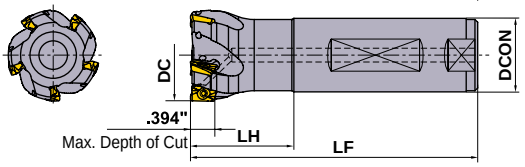


Fig.4



SHANK TYPE

Right hand tool holder only.

Type		RE (inch)	Order Number	Stock R	Number of Teeth	Dimensions(inch) DC	DCON	LF	LH	✶2 RMPX	Type (Fig.)	✶1 Insert Screw	Wrench	Anti-seize Lubricant
Standard	A Holders	.008 | .079	APX3000UR081FA10SA	●	1	.500	.625	3.250	1.120	6°	1	TPS25	TIP07F	MK1KS
			APX3000UR081SA08SA	●	1	.500	.500	3.250	1.120	6°	2	TPS25	TIP07F	MK1KS
			APX3000UR102FA10SA	●	2	.625	.625	3.625	1.190	11.5°	1	TPS25	TIP07F	MK1KS
			APX3000UR102SA10SA	●	2	.625	.625	3.625	1.190	11.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR122FA12SA	●	2	.750	.750	4.375	1.380	7.5°	1	TPS25	TIP07F	MK1KS
			APX3000UR122SA12SA	●	2	.750	.750	4.375	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR123FA12SA	●	3	.750	.750	4.375	1.380	7.5°	1	TPS25	TIP07F	MK1KS
			APX3000UR123SA12SA	●	3	.750	.750	4.375	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR163FA12SA	●	3	1.000	.750	4.375	1.570	4.5°	4	TPS25−1	TIP07F	MK1KS
			APX3000UR163SA12SA	●	3	1.000	.750	4.375	1.570	4.5°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR164FA12SA	●	4	1.000	.750	4.375	1.570	4.5°	4	TPS25−1	TIP07F	MK1KS
			APX3000UR164SA12SA	●	4	1.000	.750	4.375	1.570	4.5°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR163FA16SA	●	3	1.000	1.000	4.750	1.570	4.5°	1	TPS25−1	TIP07F	MK1KS
			APX3000UR163SA16SA	●	3	1.000	1.000	4.750	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR164FA16SA	●	4	1.000	1.000	4.750	1.570	4.5°	1	TPS25−1	TIP07F	MK1KS
			APX3000UR164SA16SA	●	4	1.000	1.000	4.750	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR205FA20SA	●	5	1.250	1.250	5.125	1.970	3.1°	1	TPS25−1	TIP07F	MK1KS
			APX3000UR205SA20SA	●	5	1.250	1.250	5.125	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR246FA20SA	●	6	1.500	1.250	5.125	1.970	2.3°	4	TPS25−1	TIP07F	MK1KS
			APX3000UR246SA20SA	●	6	1.500	1.250	5.125	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS
	B Holders	.094 | .125	APX3000UR081SA08SB	●	1	.500	.500	3.250	1.120	6°	2	TPS25	TIP07F	MK1KS
			APX3000UR102SA10SB	●	2	.625	.625	3.625	1.190	11.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR122SA12SB	●	2	.750	.750	4.375	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR123SA12SB	●	3	.750	.750	4.375	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR163SA12SB	●	3	1.000	.750	4.375	1.570	4.5°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR164SA12SB	●	4	1.000	.750	4.375	1.570	4.5°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR163SA16SB	●	3	1.000	1.000	4.750	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR164SA16SB	●	4	1.000	1.000	4.750	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR205SA20SB	●	5	1.250	1.250	5.125	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR246SA20SB	●	6	1.500	1.250	5.125	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS

✶1 Clamp Torque (lbf-in) : TPS25=8.9, TPS25−1=8.9

✶2 RMPX : Max. Ramping Angle

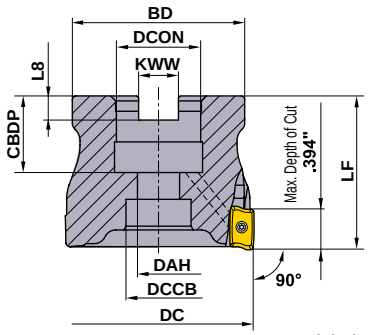
● : Inventory maintained.

Type		RE (inch)	Order Number	Stock R	Number of Teeth	Dimensions(inch) DC	DCON	LF	LH	✶2 RMPX	Type (Fig.)	✶1 Insert Screw	Wrench	Anti-seize Lubricant
Long	A Holders	.008 I .079	APX3000UR122SA12LA	●	2	.750	.750	7.250	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR162SA16LA	●	2	1.000	1.000	8.500	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR163SA16LA	●	3	1.000	1.000	8.500	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR203SA20LA	●	3	1.250	1.250	9.000	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR204SA20LA	●	4	1.250	1.250	9.000	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR243SA20LA	●	3	1.500	1.250	9.000	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR244SA20LA	●	4	1.500	1.250	9.000	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS
	B Holders	.094 I .125	APX3000UR122SA12LB	●	2	.750	.750	7.250	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR162SA16LB	●	2	1.000	1.000	8.500	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR163SA16LB	●	3	1.000	1.000	8.500	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR203SA20LB	●	3	1.250	1.250	9.000	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR204SA20LB	●	4	1.250	1.250	9.000	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR243SA20LB	●	3	1.500	1.250	9.000	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR244SA20LB	●	4	1.500	1.250	9.000	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS

✶1 Clamp Torque (lbf-in) : TPS25=8.9, TPS25−1=8.9
✶2 RMPX : Max. Ramping Angle



KAPR : 0°
GAMP : +7°−+21° T : +15°−+27°
GAMF : +15°−+27° I : +7°−+21°



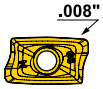
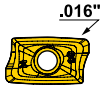
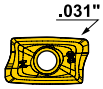
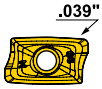
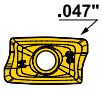
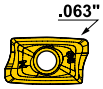
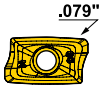
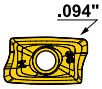
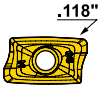
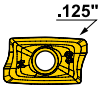
ARBOR TYPE

Right hand tool holder only.

Type	RE (inch)	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	LF	DCON	CBDP	DAH	BD	KWW	L8	DCCB	RMPX	✶1 Insert Screw	Wrench	Anti-seize Lubricant	Coolant thru Set Bolt
A Holders	.008 I .079	APX3000R0205A	●	5	2.000	1.575	.750	.748	.415	1.811	.313	.187	.600	1.6°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R0207A	●	7	2.000	1.575	.750	.748	.415	1.811	.313	.187	.600	1.6°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R2506A	●	6	2.500	1.969	1.000	1.024	.539	2.360	.375	.219	.787	1.3°	TPS25−1	TIP07F	MK1KS	HSCU50014H
		APX3000R0306A	●	6	3.000	1.969	1.000	1.024	.539	2.756	.375	.219	.787	1.0°	TPS25−1	TIP07F	MK1KS	HSCU50014H
		APX3000R0309A	●	9	3.000	1.969	1.000	1.024	.539	2.756	.375	.219	.787	1.0°	TPS25−1	TIP07F	MK1KS	HSCU50014H
B Holders	.094 I .125	APX3000R0205B	●	5	2.000	1.575	.750	.748	.415	1.811	.313	.187	.600	1.6°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R0207B	●	7	2.000	1.575	.750	.748	.415	1.811	.313	.187	.600	1.6°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R2506B	●	6	2.500	1.969	1.000	1.024	.539	2.360	.375	.219	.787	1.3°	TPS25−1	TIP07F	MK1KS	HSCU50014H
		APX3000R0306B	●	6	3.000	1.969	1.000	1.024	.539	2.756	.375	.219	.787	1.0°	TPS25−1	TIP07F	MK1KS	HSCU50014H
		APX3000R0309B	●	9	3.000	1.969	1.000	1.024	.539	2.756	.375	.219	.787	1.0°	TPS25−1	TIP07F	MK1KS	HSCU50014H

✶1 Clamp Torque (lbf-in) : TPS25−1=8.9
✶2 RMPX : Max. Ramping Angle ✶3 The cutter body includes a set bolt for an arbor.

COMBINATION OF HOLDER AND INSERT CORNER RADIUS

Holder	A Holder APX3000UR○○○○○○A							B Holder APX3000UR○○○○○○B		
Insert Corner Radius (RE)	.008"	.016"	.031"	.039"	.047"	.063"	.079"	.094"	.118"	.125"
										

INSERTS ➤ K049
OPERATION GUIDANCE ➤ K063
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig.1

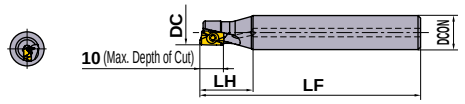


Fig.2

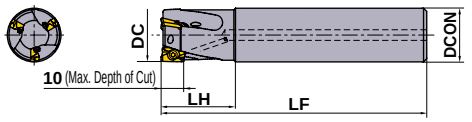
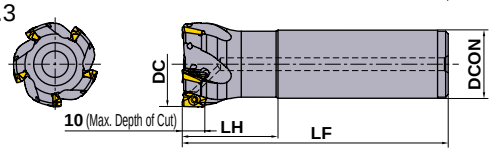


Fig.3



METRIC Standard

STRAIGHT SHANK TYPE (A Holders)

Right hand tool holder only.

Type	RE (inch)	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	DCON	LF	LH	★2 RMPX	Type (Fig.)	★1 Insert Screw	Wrench	Anti-seize Lubricant	Insert
Standard	.008 – .079	APX3000R121SA16SA	★	1	12	16	85	25	6.0°	1	TPS25	TIP07F	MK1KS	AOMT 1236◌◌ PEER-◌ AOGT 1236◌◌ PEFR-GM
		APX3000R141SA16SA	★	1	14	16	85	25	6.0°	1	TPS25	TIP07F	MK1KS	
		APX3000R162SA16SA	★	2	16	16	85	25	11.3°	2	TPS25	TIP07F	MK1KS	
		APX3000R182SA16SA	★	2	18	16	85	25	8.6°	3	TPS25	TIP07F	MK1KS	
		APX3000R202SA20SA	★	2	20	20	100	30	6.9°	2	TPS25	TIP07F	MK1KS	
		APX3000R203SA20SA	★	3	20	20	100	30	6.9°	2	TPS25	TIP07F	MK1KS	
		APX3000R223SA20SA	★	3	22	20	115	30	5.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R252SA25SA	★	2	25	25	115	35	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R253SA25SA	★	3	25	25	115	35	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R254SA25SA	★	4	25	25	115	35	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R284SA25SA	★	4	28	25	115	35	3.8°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R304SA32SA	★	4	30	32	125	45	3.4°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R323SA32SA	★	3	32	32	125	45	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R324SA32SA	★	4	32	32	125	45	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R325SA32SA	★	5	32	32	125	45	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R403SA32SA	★	3	40	32	125	45	2.2°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R405SA32SA	★	5	40	32	125	45	2.2°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R406SA32SA	★	6	40	32	125	45	2.2°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R507SA32SA	★	7	50	32	125	45	1.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R638SA32SA	★	8	63	32	125	45	1.3°	3	TPS25−1	TIP07F	MK1KS	
Long	.008 – .079	APX3000R182SA16LA	★	2	18	16	120	25	8.6°	3	TPS25	TIP07F	MK1KS	
		APX3000R202SA20LA	★	2	20	20	150	60	6.9°	2	TPS25	TIP07F	MK1KS	
		APX3000R222SA20LA	★	2	22	20	150	30	5.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R252SA25LA	★	2	25	25	170	70	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R253SA25LA	★	3	25	25	170	70	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R282SA25LA	★	2	28	25	170	35	3.8°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R283SA25LA	★	3	28	25	170	35	3.8°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R322SA32LA	★	2	32	32	190	90	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R323SA32LA	★	3	32	32	190	90	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R352SA32LA	★	2	35	32	190	45	2.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R353SA32LA	★	3	35	32	190	45	2.7°	3	TPS25−1	TIP07F	MK1KS	
Extra Long	.008 – .079	APX3000R182SA16ELA	★	2	18	16	180	25	8.6°	3	TPS25	TIP07F	MK1KS	
		APX3000R202SA20ELA	★	2	20	20	200	70	6.9°	2	TPS25	TIP07F	MK1KS	
		APX3000R222SA20ELA	★	2	22	20	200	30	5.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R252SA25ELA	★	2	25	25	220	80	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R253SA25ELA	★	3	25	25	220	80	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R282SA25ELA	★	2	28	25	220	35	3.8°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R283SA25ELA	★	3	28	25	220	35	3.8°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R322SA32ELA	★	2	32	32	260	100	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R323SA32ELA	★	3	32	32	260	100	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R352SA32ELA	★	2	35	32	260	45	2.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R353SA32ELA	★	3	35	32	260	45	2.7°	3	TPS25−1	TIP07F	MK1KS	

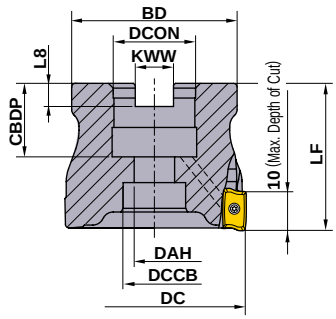
(Note) When using inserts with corner radius RE≥.094"(2.4mm), B-Holders are required as shown on page K049.

★1 Clamp Torque (lbf-in) : TPS25=8.9, TPS25−1=8.9

★2 RMPX : Max. Ramping Angle

★ : Inventory maintained in Japan.





METRIC Standard

For metric arbors

KAPR : 0°
GAMP : +7°–+21° T : +15°–+27°
GAMF : +15°–+27° I : +7°–+21°

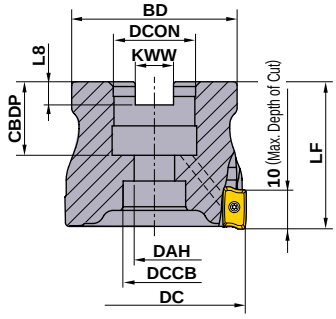
ARBOR TYPE (A Holders)

Right hand tool holder only.

RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (mm)									RMPX ★2	★1 Insert Screw	Wrench	Anti-seize Lubricant	Coolant thru Set Bolt
		R		DC	LF	DCON	CBDP	DAH	BD	KWW	L8	DCCB					
.008 I .079	APX3000-032A05RA	★	5	32	40	16	18	9	30	8.4	5.6	14	3.1°	TPS25–1	TIP07F	MK1KS	HSC08030H
	APX3000-040A06RA	★	6	40	40	16	18	9	34	8.4	5.6	14	2.2°	TPS25–1	TIP07F	MK1KS	HSC08030H
	APX3000-050A07RA	★	7	50	40	22	20	11	45	10.4	6.3	17	1.7°	TPS25–1	TIP07F	MK1KS	HSC10030H
	APX3000-063A08RA	★	8	63	40	22	20	11	55	10.4	6.3	17	1.3°	TPS25–1	TIP07F	MK1KS	HSC10030H
	APX3000-080A09RA	★	9	80	50	27	23	13	70	12.4	7	20	1.0°	TPS25–1	TIP07F	MK1KS	HSC12035H
	APX3000-100A11RA	★	11	100	63	32	26	17	80	14.4	8	26	0.8°	TPS25–1	TIP07F	MK1KS	HSC16040H

(Note) When using inserts with corner radius RE≥.094"(2.4mm), B-Holders are required as shown on page K049.
★1 Clamp Torque (lbf-in) : TPS25–1=8.9
★2 RMPX : Max. Ramping Angle
★3 Set bolt not included.





METRIC Standard

For inch arbors

KAPR : 0°
GAMP : +7°–+21° T : +15°–+27°
GAMF : +15°–+27° I : +7°–+21°

ARBOR TYPE (A Holders)

Right hand tool holder only.

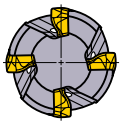
RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (mm) [inch]									RMPX ★2	★1 Insert Screw	Wrench	Anti-seize Lubricant	Coolant thru Set Bolt
		R		DC	LF	DCON	CBDP	DAH	BD	KWW	L8	DCCB					
.008 I .079	APX3000R08009CA	★	9	80	50	25.4 [1.0"]	26	13	70	9.5	6	20	1.0°	TPS25–1	TIP07F	MK1KS	HSC12035H
	APX3000R10011DA	★	11	100	63	31.75 [1.25"]	32	17	80	12.7	8	26	0.8°	TPS25–1	TIP07F	MK1KS	HSC16040H

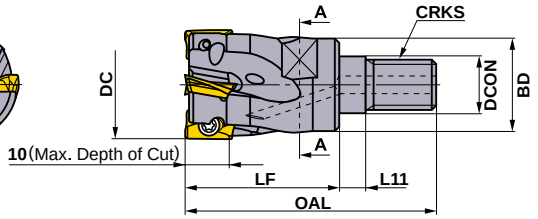
(Note) When using inserts with corner radius RE≥.094"(2.4mm), B-Holders are required as shown on page K049.
★1 Clamp Torque (lbf-in) : TPS25–1=8.9
★2 RMPX : Max. Ramping Angle
★3 Set bolt not included.

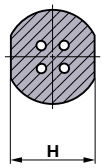
INSERTS ➤ K049
OPERATION GUIDANCE ➤ K063
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



● Air / coolant through.







METRIC Standard

SCREW-IN TYPE (A Holders)

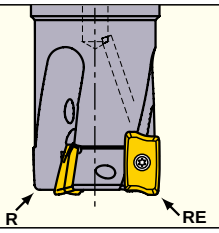
Right hand tool holder only.

RE (inch)	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	DCON	BD	OAL	LF	L11	H	CRKS ★2	WT ★3 (kg)	★1 Insert Screw	Wrench	Anti-seize Lubricant	Insert
.008 I .079	APX3000R162M08A30	★	2	16	8.5	13	48	30	6	10	M8	0.1	TPS25	TIP07F	MK1KS	AOMT 1236◯◯ PEER-◯ AOGT 1236◯◯ PEFR-GM
	APX3000R182M08A30	★	2	18	8.5	13	48	30	6	10	M8	0.1	TPS25	TIP07F	MK1KS	
	APX3000R203M10A30	★	3	20	10.5	18	49	30	6	14	M10	0.1	TPS25	TIP07F	MK1KS	
	APX3000R223M10A30	★	3	22	10.5	18	49	30	6	14	M10	0.1	TPS25−1	TIP07F	MK1KS	
	APX3000R254M12A35	★	4	25	12.5	21	57	35	6	19	M12	0.2	TPS25−1	TIP07F	MK1KS	
	APX3000R284M12A35	★	4	28	12.5	21	57	35	6	19	M12	0.2	TPS25−1	TIP07F	MK1KS	
	APX3000R304M16A40	★	4	30	17	29	63	40	6	24	M16	0.3	TPS25−1	TIP07F	MK1KS	
	APX3000R325M16A40	★	5	32	17	29	63	40	6	24	M16	0.3	TPS25−1	TIP07F	MK1KS	
	APX3000R355M16A40	★	5	35	17	29	63	40	6	24	M16	0.3	TPS25−1	TIP07F	MK1KS	
	APX3000R406M16A40	★	6	40	17	29	63	40	6	24	M16	0.3	TPS25−1	TIP07F	MK1KS	

★1 Clamp Torque (lbf-in) : TPS25=8.9, TPS25−1=8.9
★2 Clamp Torque of the Head (lbf-ft) : M8=17.1, M10=33.8, M12=59.2, M16=66.7
★3 WT : Mass
(Note) For large R inserts
APX offers various nose radii for inserts, however one holder can NOT secure every insert radius.
We offer A-Holders that properly secures up to .079" radius.
Customers may modify holders as below, so that larger nose radii can be secured.

NOTE ON USE OF INSERTS WITH LARGE CORNER RADII

When using inserts with corner radius RE≥R.094", please machine the holder with a radius form as shown on the right table.



RE	R
.094"	.106" (B-Holder)
.118"	
.125"	

R : Holder end radius
RE : Insert corner radius

Or B-Holders are available as non stock, produced to order only.
"Order numbers"; Please add "B" to the end of the order number of A-Holders.
Ex) APX3000R162M08A30→APX3000R162M08A30B

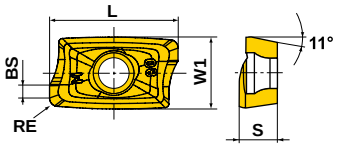
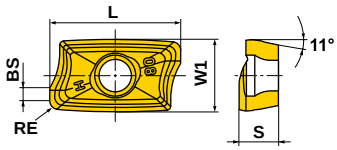
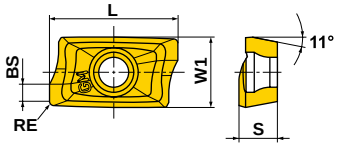
● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

INSERTS

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	
S	Heat-resistant Alloy, Titanium Alloy	
H	Hardened Steel	

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✱ : Unstable Cutting

Honing :
E : Round **F :** Sharp

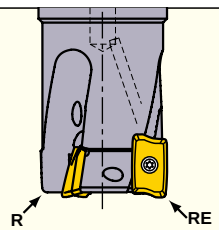
Shape	Order Number	Class	Honing	Coated								Carbide		Dimensions (inch)					Geometry
				MC5020	MP6120 (NEW)	MP6130 (NEW)	MP7130 (NEW)	MP9120 (NEW)	MP9130 (NEW)	VP15TF	VP20RT	TF15		L	W1	S	BS	RE	
General **M** Breaker	**AOMT123602PEER-M**	M	E		●	●	●	●	●	●	●			.472	.260	.142	.071	.008	
	AOMT**123604PEER-M**	M	E		●	●	●	●	●	●	●			.472	.260	.142	.063	.016	
	AOMT**123608PEER-M**	M	E		●	●	●	●	●	●	●			.472	.260	.142	.047	.031	
	AOMT**123610PEER-M**	M	E		●	●	●	●	●	★	★			.472	.260	.142	.039	.039	
	AOMT**123612PEER-M**	M	E		●	●	●	●	●	●	●			.472	.260	.142	.031	.047	
	AOMT**123616PEER-M**	M	E		●	●	●	●	●	●	●			.472	.260	.142	.016	.063	
	AOMT**123620PEER-M**	M	E		●	●	●	●	●	●	●			.472	.260	.142	.016	.079	
	AOMT**123624PEER-M**	M	E		●	●	●	●	●	●	●			.472	.260	.142	.016	.094	
	AOMT**123630PEER-M**	M	E		●	●	●	●	●	●	●			.472	.260	.142	.016	.118	
	AOMT**123632PEER-M**	M	E		●	●	●	●	●	●	●			.472	.260	.142	.016	.125	
Strong Cutting Edge Type **H** Breaker	**AOMT123604PEER-H**	M	E	●	●	●	●	●	●	●	●			.472	.260	.142	.063	.016	
	AOMT**123608PEER-H**	M	E	●	●	●	●	●	●	●	●			.472	.260	.142	.047	.031	
	AOMT**123616PEER-H**	M	E	●	●	●	●	●	●	●	●			.472	.260	.142	.016	.063	
For Machining of Aluminium Alloys **GM** Breaker	**AOGT123602PEFR-GM**	G	F									●		.472	.260	.142	.071	.008	
	AOGT**123604PEFR-GM**	G	F									●		.472	.260	.142	.063	.016	
	AOGT**123608PEFR-GM**	G	F									●		.472	.260	.142	.047	.031	

(Note) For large R inserts
APX offers various nose radii for inserts, however one holder can NOT secure every insert radius.
We offer A-Holders that properly secures up to .079" radius.
We offer B-Holders that secures .094", .118" and .125" radius, only for popular inch sizes.
Customers may modify holders as below, so that larger nose radii can be secured.

■ = MIRACLE SIGMA

NOTE ON USE OF INSERTS WITH LARGE CORNER RADII

When using inserts with corner radius RE≥R.079", please machine the holder with a radius form as shown on the right table.



RE	R
.094"	.106" (B-Holder)
.118"	
.125"	

R : Holder end radius
RE : Insert corner radius

Or additional B-Holders are available as non stock, produced to order only.
"Order numbers"; Please replace the last letter "A" of A-Holders to "B".
Ex) APX3000R08009CA→APX3000R08009CB

SCREW-IN ARBORS ➤ K162
SPARE PARTS ➤ M001
OPERATION GUIDANCE ➤ K063
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED

	Work Material	Hardness	Insert Grade 1st Recommenedation	Insert Grade 2nd Recommenedation	Breaker		Cutting Width **ae** (inch) ≤.25DC	.25—.5DC	.5—.75DC	DC (Slot)
							Cutting Speed **vc** (SFM)			
P	Mild Steel	≤180HB	MP6120	VP15TF	M	H	755(590—885)	720(560—850)	590(460—690)	590(460—690)
			MP6130	VP20RT	M	H	655(490—785)	620(460—755)	490(360—590)	490(370—600)
	Carbon Steel Alloy Steel	180—350HB	MP6120	VP15TF	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
			MP6130	VP20RT	M	H	490(360—590)	460(330—560)	360(260—425)	360(260—425)
M	Stainless Steel	≤270HB	MP7130	VP20RT	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
K	Gray Cast Iron	≤350MPa	MC5020	VP15TF	H		820(655—985)	785(620—950)	690(525—850)	460(360—525)
	Ductile, Cast Iron	≤800MPa	MC5020	VP15TF	H		425(330—490)	395(295—460)	330(260—395)	330(260—395)
N	Aluminum Alloy	—	TF15		GM		1640(655—3280)	1640(655—3280)	1640(655—3280)	1640(655—3280)
S	Titanium Alloy	≤350HB	MP9120	VP15TF	M	H	165(130—230)			165(130—230)
			MP9130	VP20RT	M	H	130(100—195)			130(100—195)
	Heat-resistant Alloy	—	MP9120	VP15TF	M	H	130(100—195)			130(100—195)
			MP9130	VP20RT	M	H	100(65—130)			100(65—130)
H	Hardened Steel	40—55HRC	VP15TF		H		295(230—330)	280(195—330)	230(165—260)	230(165—260)

DEPTH OF CUT / FEED PER TOOTH

	Work Material	Hardness	Cutting Width **ae** (inch)	Cutter Diameter (inch) ϕ.500"—ϕ.625"(ϕ12—ϕ16mm) Depth of Cut **ap** (inch)	ϕ.500"—ϕ.625"(ϕ12—ϕ16mm) Feed per Tooth **fz** (IPT)	ϕ.750"—ϕ1.000"(ϕ20—ϕ25mm) Depth of Cut **ap** (inch)	ϕ.750"—ϕ1.000"(ϕ20—ϕ25mm) Feed per Tooth **fz** (IPT)	ϕ1.250"—ϕ3.000"(ϕ28—ϕ100mm) Depth of Cut **ap** (inch)	ϕ1.250"—ϕ3.000"(ϕ28—ϕ100mm) Feed per Tooth **fz** (IPT)
P	Mild Steel Carbon Steel Alloy Steel	≤180HB 180—350HB	≤.25DC	≤.157	.006	≤.197	.010	≤.197	.008
				.157—.276	.004	.197—.276	.008	.197—.276	.006
						.276—.335	.006	.276—.335	.004
						.335—.394	.004	.335—.394	.003
			.25—.5DC	≤.079	.006	≤.118	.010	≤.118	.008
				.078—.197	.004	.118—.217	.008	.118—.217	.006
						.217—.315	.006	.217—.315	.004
						.315—.394	.004	.315—.394	.003
			.5—.75DC	≤.157	.004	≤.157	.006	≤.118	.004
						.157—.394	.004	.118—.276	.003
			DC (Slot)	≤.118	.004	≤.157	.004	≤.118	.004
						.157—.276	.003	.118—.197	.003
M	Stainless Steel	≤270HB	≤.25DC	≤.157	.006	≤.197	.008	≤.197	.008
				.157—.276	.004	.197—.276	.006	.197—.276	.006
						.276—.335	.004	.276—.335	.004
						.335—.394	.003	.335—.394	.004
			.25—.5DC	≤.079	.006	≤.118	.008	≤.118	.008
				.078—.197	.004	.118—.217	.006	.118—.217	.006
						.217—.315	.004	.217—.315	.004
						.315—.394	.003	.315—.394	.003
			.5—.75DC	≤.157	.004	≤.157	.004	≤.118	.004
						.157—.394	.003	.118—.276	.003
			DC (Slot)	≤.157	.004	≤.157	.100	≤3	.100
						.157—.276	.003	.118—.197	.003
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.25DC	≤.157	.006	≤.197	.010	≤.197	.008
				.157—.276	.004	.197—.276	.008	.197—.276	.006
						.276—.335	.006	.276—.335	.004
						.335—.394	.004	.335—.394	.003
			.25—.5DC	≤.079	.006	≤.118	.010	≤.118	.008
				.079—.197	.004	.118—.217	.008	.118—.217	.006
						.217—.315	.006	.217—.315	.004
						.315—.394	.004	.315—.394	.003
			.5—.75DC	≤.157	.004	≤.157	.006	≤.118	.004
						.157—.394	.004	.118—.276	.003
			DC (Slot)	≤.118	.004	≤.157	.004	≤.118	.004
						.157—.276	.003	.118—.197	.003
	Ductile, Cast Iron	Tensile Strength ≤800MPa	≤.25DC	≤.157	.004	≤.197	.008	≤.197	.008
				.157—.276	.003	.197—.276	.006	.197—.276	.006
						.276—.335	.004	.276—.335	.004
						.335—.394	.003	.335—.394	.003
			.25—.5DC	≤.079	.004	≤.118	.008	≤.118	.008
				.079—197	.003	.118—.217	.006	.118—.217	.006
						.217—.315	.004	.217—.315	.004
						.315—.394	.003	.315—.394	.003
			.5—.75DC	≤.157	.003	≤.157	.004	≤.118	.004
						.315—.394	.003	.118—.276	.003
			DC (Slot)	≤.118	.003	≤.157	.100	≤3	.100
						.157—.276	.003	.118—.197	.003

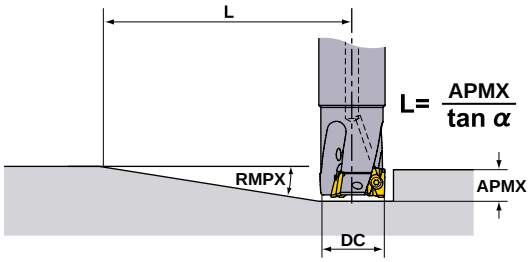
CUTTING CONDITIONS FOR SLOT MILLING

Work Material		Hardness	Cutting Width **ae** (inch)	Cutter Diameter (inch)					
				ϕ.500"–ϕ.625"(ϕ12–ϕ16mm)		ϕ.750"–ϕ1.000"(ϕ20–ϕ25mm)		ϕ1.250"–ϕ3.000"(ϕ28–ϕ100mm)	
				Depth of Cut **ap** (inch)	Feed per Tooth **fz** (IPT)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (IPT)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (IPT)
N	Aluminum Alloy	–	≤.25DC	≤.157	.006	≤.157	.010	≤.157	.008
				.157–.276	.004	.157–.276	.006	.157–.276	.004
			.25–.5DC	≤.157	.004	≤.157	.008	≤.157	.008
				.157–.276	.004	.157–.276	.004	.157–.276	.004
			.5–.75DC	≤.197	.004	≤.197	.006	≤.197	.004
			DC (Slot)	≤.197	.004	≤.197	.008	≤.197	.006
S	Titanium Alloy	≤350HB	≤.25DC	≤.157	.006	≤.157	.006	≤.157	.004
				.157–.276	.004	.157–.276	.004	.157–.276	.003
			.25–.5DC	≤.118	.002	≤.118	.002	≤.118	.002
	Heat-resistant Alloy	–	.5–.75DC	≤.079	.004	≤.079	.002	≤.079	.002
			DC (Slot)	≤.039	.002	≤.039	.002	≤.039	.002
H	Hardened Steel	40–55HRC	≤.25DC	≤.157	.004	≤.197	.006	≤.197	.006
				.157–.276	.003	.197–.276	.004	.197–.276	.004
						.276–.335	.003		
			.25–.5DC	≤.079	.004	≤.118	.006	≤.118	.006
				.079–.197	.003	.118–.217	.004		
			.5–.75DC	≤.157	.003	≤.157	.003	≤.118	.003
			DC (Slot)	≤.118	.003	≤.157	.003	≤.118	.003

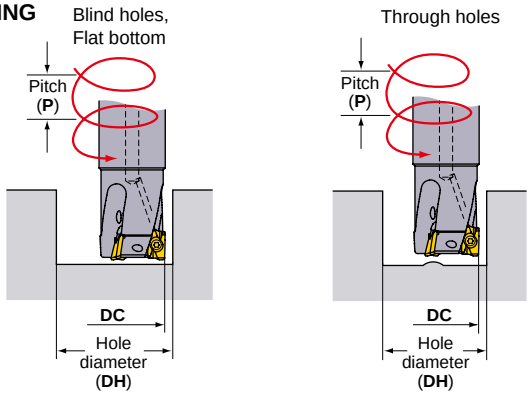
(Note 1) These cutting conditions are a guide to the standard shank type and the arbor type.
Please make adjustments according to the machining conditions.
(Note 2) Vibration is liable to occur in certain cases. Please reduce the depth of cut and / or reduce cutting conditions in the following cases.
• When using the long shank type and extra long shank type.
• When using long tool overhang with the standard or arbor type.
• When the application has poor clamping rigidity or when using a low rigidity machine.
(Note 3) In case of coarse and fine pitch cutters, the coarse pitch type is recommended to prevent vibration.
(Note 4) For heavy interrupted and unstable cutting, the H breaker is first recommendation.

RAMPING/HELICAL CUTTING

RAMPING



HELICAL CUTTING



Refer to the table below when using .031 inch radius for maximum ramping angle, pitch and minimum/maximum hole diameter. Use cutting conditions for slotting to calculate speed and feed when ramping / helical cutting.

Cutting Edge Diameter **DC** (inch)	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
	Maximum Ramping Angle **RMPX**	Minimum Distance 1) **L** (inch)	Maximum Hole Diameter 2) **DH max.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)
.500	6.0°	3.8	0.92	.09	.87	.07	.63	.020
.625	11.5°	1.9	1.17	.35	1.1	.27	.79	.079
.750	7.5°	3.0	1.42	.19	1.35	.17	1.03	.079
1.000	4.5°	5.0	1.92	.23	1.85	.19	1.58	.079
1.250	3.1°	7.3	2.42	.17	2.35	.15	2.05	.079
1.500	2.3°	9.8	2.92	.15	2.85	.13	2.56	.079
2.000	1.6°	14.1	3.92	.07	3.85	.07	3.55	.079
2.500	1.3°	17.4	4.92	.07	4.85	.07	4.56	.079
3.000	1.0°	22.6	5.92	.07	5.85	.07	5.52	.079

(Note 1) L(=.394"/tanα). Cutters' moving distance until depth of cut reaches .394" at a maximum ramping angle.
(Note 2) In case corner radius of .031". Other than that, find with the below formula.
{(cutting edge diameter DC) - (corner radius) - .008"} x 2
(Note 3) When machining highly ductile materials with ramping angles above, chips could be continuous.
In this case, decrease the ramping angle or feed per tooth.

MULTI FUNCTIONAL MILLING

Finishing Roughing

Including Flat faces

APX4000

P M K N S H



Fig.1

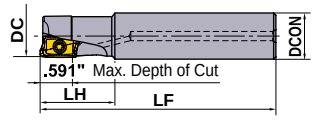


Fig.2

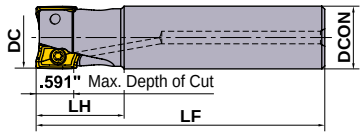


Fig.3

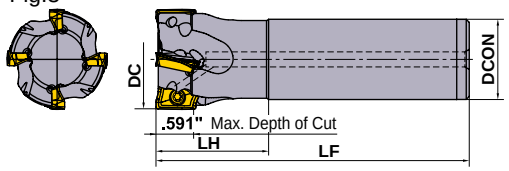


Fig.4

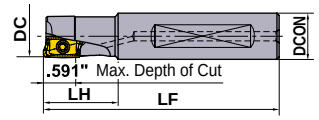


Fig.5

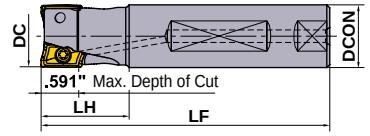
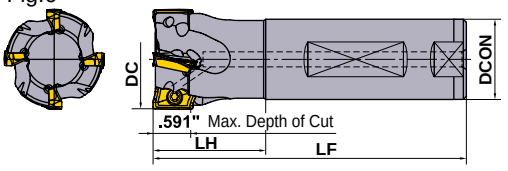


Fig.6



Right hand tool holder only.

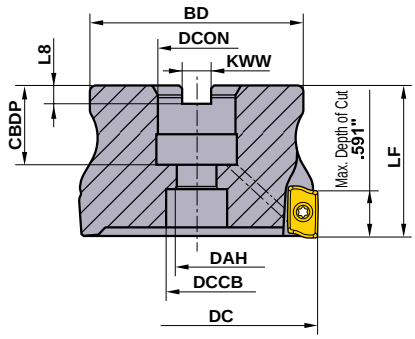
•APX4000UR○○○SA○○ = Ground shank : See figure 1, 2 and 3.
•APX4000UR○○○FA○○ = Flat shank : See figure 4 and 5.

SHANK TYPE

Type		RE (inch)	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	DCON	LF	LH	★2 RMPX	Type (Fig.)	★1 Insert Screw	Wrench	Anti-seize Lubricant
Standard	A Holders	.016 I .079	APX4000UR121FA12SA	●	1	.750	.750	4.000	1.250	14°	4	TPS4S	TIP15W	MK1KS
			APX4000UR121SA12SA	●	1	.750	.750	4.000	1.250	14°	1	TPS4S	TIP15W	MK1KS
			APX4000UR162SA12SA	●	2	1.000	.750	4.000	1.250	11°	3	TPS4	TIP15W	MK1KS
			APX4000UR162FA16SA	●	2	1.000	1.000	4.500	1.250	11°	4	TPS4	TIP15W	MK1KS
			APX4000UR162SA16SA	●	2	1.000	1.000	4.500	1.250	11°	2	TPS4	TIP15W	MK1KS
			APX4000UR202FA20SA	●	2	1.250	1.250	5.000	1.750	7°	5	TPS4	TIP15W	MK1KS
			APX4000UR202SA20SA	●	2	1.250	1.250	5.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR203FA20SA	●	3	1.250	1.250	5.000	1.750	7°	5	TPS4	TIP15W	MK1KS
			APX4000UR203SA20SA	●	3	1.250	1.250	5.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR243FA20SA	●	3	1.500	1.250	5.000	1.750	7°	6	TPS43	TIP15W	MK1KS
			APX4000UR243SA20SA	●	3	1.500	1.250	5.000	1.750	7°	3	TPS43	TIP15W	MK1KS
			APX4000UR244FA20SA	●	4	1.500	1.250	5.000	1.750	7°	6	TPS43	TIP15W	MK1KS
			APX4000UR244SA20SA	●	4	1.500	1.250	5.000	1.750	7°	3	TPS43	TIP15W	MK1KS
	B Holders	.125 I .157	APX4000UR121FA12SB	●	1	.750	.750	4.000	1.250	14°	4	TPS4S	TIP15W	MK1KS
			APX4000UR162FA16SB	●	2	1.000	1.000	4.500	1.250	11°	5	TPS4	TIP15W	MK1KS
			APX4000UR202FA20SB	●	2	1.250	1.250	5.000	1.750	7°	5	TPS4	TIP15W	MK1KS
			APX4000UR203FA20SB	●	3	1.250	1.250	5.000	1.750	7°	5	TPS4	TIP15W	MK1KS
			APX4000UR243FA20SB	●	3	1.500	1.250	5.000	1.750	7°	6	TPS43	TIP15W	MK1KS
			APX4000UR244FA20SB	●	4	1.500	1.250	5.000	1.750	7°	6	TPS43	TIP15W	MK1KS
Long	A Holders	.016 I .079	APX4000UR162SA16LA	●	2	1.000	1.000	8.500	1.250	11°	2	TPS4	TIP15W	MK1KS
			APX4000UR202SA20LA	●	2	1.250	1.250	9.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR203SA20LA	●	3	1.250	1.250	9.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR243SA24LA	●	3	1.500	1.500	9.000	1.750	7°	2	TPS43	TIP15W	MK1KS
			APX4000UR244SA24LA	●	4	1.500	1.500	9.000	1.750	7°	2	TPS43	TIP15W	MK1KS
			APX4000UR243SA24ELA	●	3	1.500	1.500	14.000	1.750	7°	2	TPS43	TIP15W	MK1KS
	B Holders	.125 I .157	APX4000UR162SA16LB	●	2	1.000	1.000	8.500	1.250	11°	2	TPS4	TIP15W	MK1KS
			APX4000UR202SA20LB	●	2	1.250	1.250	9.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR203SA20LB	●	3	1.250	1.250	9.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR243SA24LB	●	3	1.500	1.500	9.000	1.750	7°	2	TPS43	TIP15W	MK1KS
			APX4000UR244SA24LB	●	4	1.500	1.500	9.000	1.750	7°	2	TPS43	TIP15W	MK1KS
			APX4000UR243SA24ELB	●	3	1.500	1.500	14.000	1.750	7°	2	TPS43	TIP15W	MK1KS

(Note) When using inserts with corner radius RE≥.125"(3.2mm), B-Holders or C-Holders are required as shown on page K057.
★1 Clamp Torque (lbf-in) : TPS4=31, TPS4S=31, TPS43=31
★2 RMPX : Max. Ramping Angle
● : **Inventory maintained.**





KAPR:0°
GAMP:+15°—+22°　T :+21°—+28°
GAMF:+21°—+28°　I :+15°—+22°

ARBOR TYPE

Right hand tool holder only.

Type	RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (inch)									✶2 RMPX	✶1 Insert Screw	Wrench	Anti-seize Lubricant	Coolant thru Set Bolt
			R		DC	LF	DCON	CBDP	DAH	BD	KWW	L8	DCCB					
A Holders	.016 I .079	APX4000UR0204A	●	4	2.000	1.625	.750	.748	.415	1.875	.313	.187	.600	4°	TPS43	TIP15W	MK1KS	HSCU37513H
		APX4000UR0205A	●	5	2.000	1.625	.750	.748	.415	1.875	.313	.187	.600	4°	TPS43	TIP15W	MK1KS	HSCU37513H
		APX4000UR2505CA	●	5	2.500	2.000	1.000	1.024	.539	2.375	.375	.219	.787	2°	TPS43	TIP15W	MK1KS	HSCU50014H
		APX4000UR0306DA	●	6	3.000	2.500	1.250	1.260	.669	2.874	.500	.281	1.024	2°	TPS43	TIP15W	MK1KS	HSCU62516H
		APX4000UR0307DA	●	7	3.000	2.500	1.250	1.260	.669	2.874	.500	.281	1.024	2°	TPS43	TIP15W	MK1KS	HSCU62516H
		APX4000UR0408EA	●	8	4.000	2.500	1.500	1.181	.787	3.799	.625	.375	1.181	1.5°	TPS43	TIP15W	MK1KS	HSCU75016H
B Holders	.125 I .157	APX4000UR0204B	●	4	2.000	1.625	.750	.748	.415	1.875	.313	.187	.600	4°	TPS43	TIP15W	MK1KS	HSCU37513H
		APX4000UR0205B	●	5	2.000	1.625	.750	.748	.415	1.875	.313	.187	.600	4°	TPS43	TIP15W	MK1KS	HSCU37513H
		APX4000UR2505CB	●	5	2.500	2.000	1.000	1.024	.539	2.375	.375	.219	.787	2°	TPS43	TIP15W	MK1KS	HSCU50014H
		APX4000UR0306DB	●	6	3.000	2.500	1.250	1.260	.669	2.874	.500	.281	1.024	2°	TPS43	TIP15W	MK1KS	HSCU62516H
		APX4000UR0307DB	●	7	3.000	2.500	1.250	1.260	.669	2.874	.500	.281	1.024	2°	TPS43	TIP15W	MK1KS	HSCU62516H
		APX4000UR0408EB	●	8	4.000	2.500	1.500	1.181	.787	3.799	.625	.375	1.181	1.5°	TPS43	TIP15W	MK1KS	HSCU75016H

(Note) When using inserts with corner radius RE≥.197"(5.0mm), C-Holders are required as shown on page K057.
✶1 Clamp Torque (lbf-in) : TPS43=31
✶2 RMPX : Max. Ramping Angle
✶3 The cutter body includes a set bolt for an arbor.

COMBINATION OF HOLDER AND INSERT CORNER RADIUS

Holder	A Holder						B Holder		C Holder	
	APX4000UR○○○○○○A						APX4000UR○○○○○○B		APX4000UR○○○○○○C	
Insert Corner Radius (RE)	.016"	.031"	.039"	.047"	.063"	.079"	.125"	.157"	.197"	.250"

MILLING

INSERTS ➤ K057
OPERATION GUIDANCE ➤ K063
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig.1

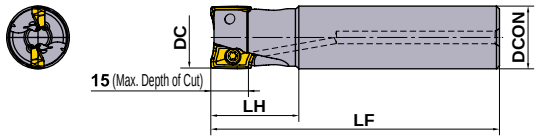
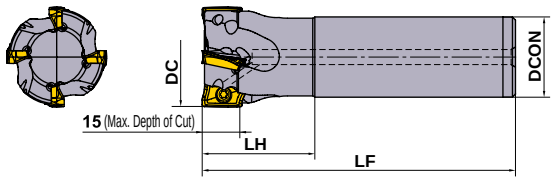


Fig.2



METRIC Standard

STRAIGHT SHANK TYPE (A Holders)

Right hand tool holder only.

Type	RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (mm)				★2 RMPX	Type (Fig.)	★1 Insert Screw	Wrench	Anti-seize Lubricant	Insert
			R		DC	DCON	LF	LH						
Standard	.016 I .079	**APX4000R252SA25SA**	★	2	25	25	115	35	11°	1	TPS4	TIP15W	MK1KS	AOMT 1848○○ PEER-○
		APX4000R**322SA32SA**	★	2	32	32	125	45	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R**323SA32SA**	★	3	32	32	125	45	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R**403SA32SA**	★	3	40	32	125	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R**404SA32SA**	★	4	40	32	125	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R**504SA32SA**	★	4	50	32	125	45	4°	2	TPS43	TIP15W	MK1KS	
		APX4000R**505SA32SA**	★	5	50	32	125	45	4°	2	TPS43	TIP15W	MK1KS	
		APX4000R**634SA32SA**	★	4	63	32	125	45	3°	2	TPS43	TIP15W	MK1KS	
		APX4000R**636SA32SA**	★	6	63	32	125	45	3°	2	TPS43	TIP15W	MK1KS	
Long	.016 I .079	**APX4000R252SA25LA**	★	2	25	25	170	35	11°	1	TPS4	TIP15W	MK1KS	
		APX4000R**282SA25LA**	★	2	28	25	170	35	9°	2	TPS4	TIP15W	MK1KS	
		APX4000R**322SA32LA**	★	2	32	32	190	45	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R**323SA32LA**	★	3	32	32	190	45	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R**352SA32LA**	★	2	35	32	190	45	6°	2	TPS4	TIP15W	MK1KS	
		APX4000R**353SA32LA**	★	3	35	32	190	45	6°	2	TPS4	TIP15W	MK1KS	
		APX4000R**402SA32LA**	★	2	40	32	190	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R**403SA32LA**	★	3	40	32	190	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R**404SA32LA**	★	4	40	32	190	45	6°	2	TPS43	TIP15W	MK1KS	
Extra Long	.016 I .079	**APX4000R252SA25ELA**	★	2	25	25	220	80	11°	1	TPS4	TIP15W	MK1KS	
		APX4000R**282SA25ELA**	★	2	28	25	220	35	9°	2	TPS4	TIP15W	MK1KS	
		APX4000R**322SA32ELA**	★	2	32	32	260	100	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R**323SA32ELA**	★	3	32	32	260	100	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R**352SA32ELA**	★	2	35	32	260	45	6°	2	TPS4	TIP15W	MK1KS	
		APX4000R**353SA32ELA**	★	3	35	32	260	45	6°	2	TPS4	TIP15W	MK1KS	
		APX4000R**402SA32ELA**	★	2	40	32	260	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R**403SA32ELA**	★	3	40	32	260	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R**404SA32ELA**	★	4	40	32	260	45	6°	2	TPS43	TIP15W	MK1KS	

(Note) When using inserts with corner radius RE≥.125"(3.2mm), B-Holders or C-Holders are required as shown on page K057.
★1 Clamp Torque (lbf-in) : TPS4=31, TPS43=31
★2 RMPX : Max. Ramping Angle

★ : Inventory maintained in Japan.



Fig.1

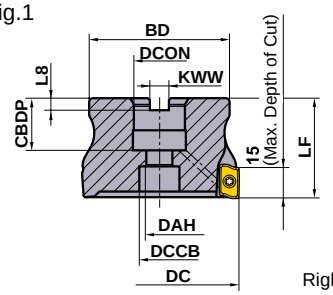
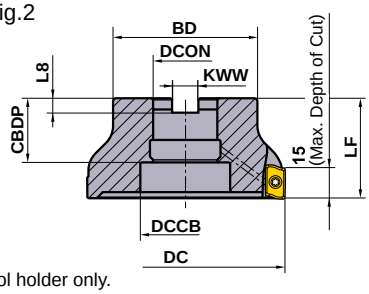


Fig.2



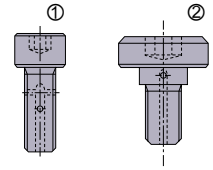
Right hand tool holder only.

METRIC Standard

For inch arbors

KAPR:0°
GAMP:+15°—+22°　T :+21°—+28°
GAMF:+21°—+28°　I :+15°—+22°

Cutter Diameter DC	Set Bolt	Geometry
ϕ80	HSC12035H	①
ϕ100	HSC16040H	
ϕ125	MBA20040H	②
ϕ160	MBA24045H	



ARBOR TYPE (A Holders)

RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (mm) [inch]									★3 WT	★2 RMPX	Type (Fig.)	★1 Insert Screw	Wrench	Anti-seize Lubricant	Insert
		R		DC	LF	DCON	CBDP	DAH	BD	KWW	L8	DCCB	(kg)						
.016 I .079	APX4000R08007CA	★	7	80	50	25.4 [1.0"]	26	13	70	9.5	6	20	1.2	2°	1	TPS43	TIP15W	MK1KS	AOMT 1848○○ PEER-○
	APX4000R10008DA	★	8	100	63	31.75 [1.25"]	32	17	80	12.7	8	26	2.1	1.5°	1	TPS43	TIP15W	MK1KS	
	APX4000R12509EA	★	9	125	63	38.1 [1.5"]	40	—	100	15.9	10	56	3.3	1°	2	TPS43	TIP15W	MK1KS	
	APX4000R16010FA	★	10	160	63	50.8 [2.0"]	40	—	100	19.1	11	72	4.8	1°	2	TPS43	TIP15W	MK1KS	

(Note) When using inserts with corner radius RE≥.125"(3.2mm), B-Holders or C-Holders are required as shown on page K057.
★1 Clamp Torque (lbf-in) : TPS43=31
★2 RMPX : Max. Ramping Angle
★3 WT : Mass
★4 Set bolt not included.

MILLING

INSERTS ➤ K057
OPERATION GUIDANCE ➤ K063
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig.1

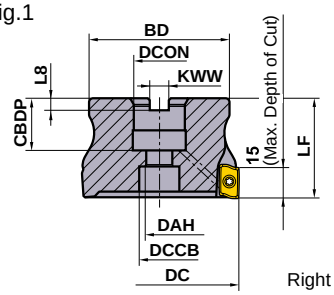
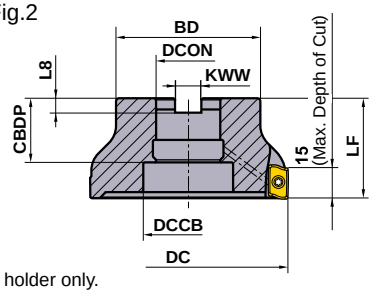
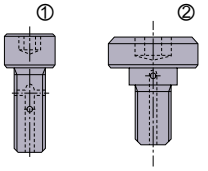


Fig.2



Right hand tool holder only.

Cutter Diameter DC	Set Bolt	Geometry
ϕ40	HSC08030H	①
ϕ50, ϕ63	HSC10030H	①
ϕ80	HSC12035H	①
ϕ100	HSC16040H	①
ϕ125	MBA20040H	②
ϕ160	MBA20040H	②



METRIC Standard

For metric arbors

C H :0°
A.R :+15°—+22° T :+21°—+28°
R.R :+21°—+28° I :+15°—+22°

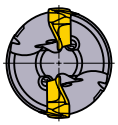
ARBOR TYPE (A Holders)

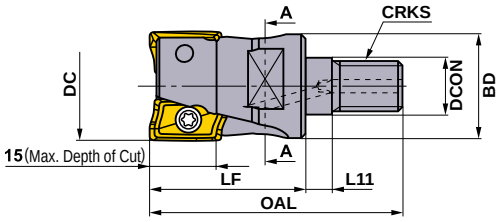
RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (mm)									WT ★3	RMPX ★2	Type (Fig.)	Insert Screw ★1	Wrench	Anti-seize Lubricant	Insert
		R		DC	LF	DCON	CBDP	DAH	BD	KWW	L8	DCCB	(kg)						
.016 I .079	APX4000-040A04RA	★	4	40	40	16	18	9	34	8.4	5.6	14	0.2	6°	1	TPS43	TIP15W	MK1KS	AOMT 1848○○ PEER-○
	APX4000-050A05RA	★	5	50	40	22	20	11	45	10.4	6.3	17	0.3	4°	1	TPS43	TIP15W	MK1KS	
	APX4000-063A06RA	★	6	63	40	22	20	11	50	10.4	6.3	17	0.5	3°	1	TPS43	TIP15W	MK1KS	
	APX4000-080A07RA	★	7	80	50	27	23	13	60	12.4	7	20	1.2	2°	1	TPS43	TIP15W	MK1KS	
	APX4000-100A08RA	★	8	100	50	32	25	17	70	14.4	8	27	2.1	1.5°	1	TPS43	TIP15W	MK1KS	
	APX4000-125A09RA	★	9	125	63	40	40	—	90	16.4	9	56	3.3	1°	2	TPS43	TIP15W	MK1KS	
	APX4000-160A10RA	★	10	160	63	40	40	—	100	16.4	9	72	4.8	1°	2	TPS43	TIP15W	MK1KS	

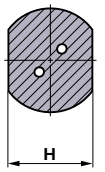
(Note) When using inserts with corner radius RE≥.125"(3.2mm), B-Holders or C-Holders are required as shown on page K057.
★1 Clamp Torque (lbf-in) : TPS43=31 ★2 RMPX : Max. Ramping Angle ★3 WT : Mass
★4 Set bolt not included.



● Air / coolant through.







Section A-A

METRIC Standard

SCREW-IN TYPE (A Holders)

Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (mm)								WT ★3	Insert Screw ★1	Wrench	Anti-seize Lubricant	Insert
	R		DC	DCON	BD	OAL	LF	L11	H	CRKS ★2	(kg)				
APX4000R252M12A35	★	2	25	12.5	23.5	57	35	6	19	M12	0.2	TPS4	TIP15W	MK1KS	AOMT 1848○○ PEER-○
APX4000R282M12A35	★	2	28	12.5	23.5	57	35	6	19	M12	0.2	TPS4	TIP15W	MK1KS	
APX4000R322M16A40	★	2	32	17	28.5	63	40	6	24	M16	0.3	TPS4	TIP15W	MK1KS	
APX4000R323M16A40	★	3	32	17	28.5	63	40	6	24	M16	0.3	TPS4	TIP15W	MK1KS	
APX4000R352M16A40	★	2	35	17	28.5	63	40	6	24	M16	0.3	TPS4	TIP15W	MK1KS	
APX4000R353M16A40	★	3	35	17	28.5	63	40	6	24	M16	0.3	TPS4	TIP15W	MK1KS	
APX4000R403M16A40	★	3	40	17	28.5	63	40	6	24	M16	0.3	TPS43	TIP15W	MK1KS	
APX4000R404M16A40	★	4	40	17	28.5	63	40	6	24	M16	0.3	TPS43	TIP15W	MK1KS	

(Note) When using inserts with corner radius RE≥.125"(3.2mm), B-Holders or C-Holders are required as shown on page K057.
★1 Clamp Torque (lbf-in) : TPS4=31, TPS43=31
★2 Clamp Torque of the Head (lbf-ft) : M12=59.2, M16=66.7
★3 WT : Mass

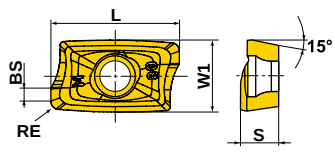
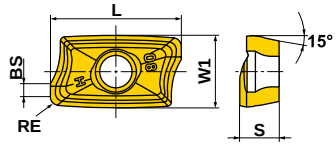
● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

INSERTS

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
S	Heat-resistant Alloy, Titanium Alloy	
H	Hardened Steel	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Honing :
E : Round **F :** Sharp

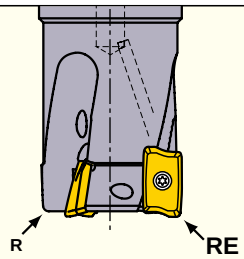
Shape	Order Number	Class	Honing	Coated								Dimensions (inch)					Geometry
				MC5020	MP6120 NEW	MP6130 NEW	MP7130 NEW	MP9120 NEW	MP9130 NEW	VP15TF	VP20RT	L	W1	S	BS	RE	
General **M** Breaker	**AOMT184804PEER-M**	M	E		●	●	●	●	●	●	●	.709	.354	.189	.071	.016	
	**AOMT184808PEER-M**	M	E		●	●	●	●	●	●	●	.709	.354	.189	.055	.031	
	AOMT184810PEER-M	M	E		●			●	●	★		.709	.354	.189	.039	.039	
	AOMT184812PEER-M	M	E		●			●	●	●		.709	.354	.189	.031	.047	
	AOMT184816PEER-M	M	E		●	●	●	●	●	●	●	.709	.354	.189	.016	.063	
	AOMT184820PEER-M	M	E		●			●	●	★		.709	.354	.189	.016	.079	
Strong Cutting Edge Type **H** Breaker	**AOMT184804PEER-H**	M	E	●	●	●	●	●	●	●	●	.709	.354	.189	.071	.016	
	**AOMT184808PEER-H**	M	E	●	●	●	●	●	●	●	●	.709	.354	.189	.055	.031	
	AOMT184816PEER-H	M	E	●	●	●	●	●	●	●	●	.709	.354	.189	.016	.063	
	AOMT184832PEER-H	M	E			●	●				●	.709	.354	.189	.016	.125	
	AOMT184840PEER-H	M	E			●	●				●	.709	.354	.189	.016	.157	
	AOMT184850PEER-H	M	E			●	●				●	.709	.354	.189	—	.197	
	AOMT184864PEER-H	M	E			●	●				●	.709	.354	.189	—	.250	

(Note) For large R inserts
APX offers various nose radii for inserts, however one holder can NOT secure every insert radius.
We offer A-Holders that properly secures up to .079" radius.
We offer B-Holders that secures .125"and .157" radius, only for popular inch sizes.
Customers may modify holders as below, so that larger nose radii can be secured.

■ = MIRACLE SIGMA

NOTE ON USE OF INSERTS WITH LARGE CORNER RADII

When using inserts with corner radius RE≥R.125", please machine the holder with a radius form as shown on the right table.



RE	R
.125"	.098" B-Holders
.157"	
.197"	.197" C-Holders
.250"	

R : Holder end radius
RE : Insert corner radius

Or additional B-Holders and C-Holders are available as non stock, produced to order only.
"Order numbers"; Please replace the last letter "A" of A-Holders to "B" or "C".
In case of screw-in holders, please add "B" or "C" to the end of the order number of A-Holders.
Ex) APX4000R08007CA→APX4000R08007CC
APX4000R252M12A35→APX4000R252M12A35C

SCREW-IN ARBORS ➤ K162
SPARE PARTS ➤ M001
OPERATION GUIDANCE ➤ K063
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED

	Work Material	Hardness	Insert Grade 1st Recommenedation	Insert Grade 2nd Recommenedation	Breaker		Cutting Width **ae** (inch) ≤.25DC	.25—.5DC	.5—.75DC	DC (Slot)
							Cutting Speed **vc** (SFM)			
P	Mild Steel	≤180HB	MP6120	VP15TF	M	H	755(590—885)	720(560—850)	590(460—690)	590(460—690)
			MP6130	VP20RT	M	H	655(490—785)	620(460—755)	490(360—590)	490(360—590)
	Carbon Steel Alloy Steel	180—350HB	MP6120	VP15TF	M	H	590(460—690)	560(430—655)	460(360—525)	460(360—590)
			MP6130	VP20RT	M	H	490(360—590)	460(330—560)	360(260—425)	360(260—425)
M	Stainless Steel	≤270HB	MP7130	VP20RT	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
K	Gray Cast Iron	≤350MPa	MC5020	VP15TF	H		820(655—985)	785(620—950)	690(525—850)	460(360—525)
	Ductile, Cast Iron	≤800MPa	MC5020	VP15TF	H		425(330—490)	395(295—460)	330(260—395)	330(260—395)
S	Titanium Alloy	≤350HB	MP9120	VP15TF	H	M	165(130—230)			165(130—230)
			MP9130	VP20RT	H	M	130(100—195)			130(100—195)
	Heat-resistant Alloy	—	MP9120	VP15TF	H	M	130(100—195)			130(100—195)
			MP9130	VP20RT	H	M	100(65—130)			100(65—130)
H	Hardened Steel	40—55HRC	VP15TF		H		295(230—330)	280(195—330)	230(165—260)	230(165—260)

DEPTH OF CUT / FEED PER TOOTH

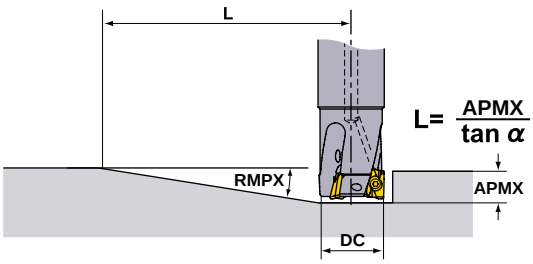
	Work Material	Hardness	Cutting Width **ae** (inch)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (IPT) Cutter Diameter (inch) ϕ.750"—ϕ1.500"(ϕ25—ϕ40mm)	ϕ2.000"—ϕ3.000"(ϕ50—ϕ80mm)	ϕ4.000"(ϕ100—ϕ160mm)
P	Mild Steel Carbon Steel Alloy Steel	≤180HB 180—350HB	≤.5DC	≤.197	.012	.012	.010
				.197—.295	.010	.010	.008
				.295—.394	.008	.008	.006
				.394—.492	.006	.006	.004
				.492—.591	.004	.004	.003
			.5—.75DC	≤.197	.008	.008	.006
				.295—.394	.006	.006	.004
				.394—.591	.004	.004	.003
			DC (Slot)	≤.197	.006	.006	.006
				.197—.295	.004	.004	.004
				.295—.394	.003	.003	.003
M	Stainless Steel	≤270HB	≤.5DC	≤.197	.012	.010	.010
				.197—.295	.010	.008	.008
				.295—.394	.008	.006	.006
				.394—.492	.006	.004	.004
				.492—.591	.004	.003	.003
			.5—.75DC	≤.197	.008	.006	.006
				.295—.394	.006	.004	.004
				.394—.591	.004	.003	.003
			DC (Slot)	≤.197	.006	.006	.006
				.197—.295	.004	.004	.004
				.295—.394	.003	.003	.003
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.5DC	≤.197	.012	.012	.010
				.197—.295	.010	.010	.008
				.295—.394	.008	.008	.006
				.394—.492	.006	.006	.004
				.492—.591	.004	.004	.003
			.5—.75DC	≤.197	.008	.008	.006
				.197—.394	.006	.006	.004
				.394—.591	.004	.004	.003
			DC (Slot)	≤.197	.006	.006	.006
				.197—.295	.004	.004	.004
				.295—.394	.003	.003	.003
	Ductile, Cast Iron	Tensile Strength ≤800MPa	≤.5DC	≤.197	.010	.010	.010
				.197—.295	.008	.008	.008
				.295—.394	.006	.006	.006
				.394—.492	.004	.004	.004
				.492—.591	.003	.003	.003
			.5—.75DC	≤.197	.008	.008	.006
				.197—.394	.006	.006	.004
				.394—.591	.004	.004	.003
			DC (Slot)	≤.197	.006	.006	.006
				.197—.295	.004	.004	.004
				.295—.394	.003	.003	.003

	Work Material	Hardness	Cutting Width **ae** (inch)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (IPT) Cutter Diameter (inch)		
					ϕ.750"–ϕ1.500"(ϕ25–ϕ40mm)	ϕ2.000"–ϕ3.000"(ϕ50–ϕ80mm)	ϕ4.000"(ϕ100–ϕ160mm)
S	Titanium Alloy	≤350HB	≤.25DC	≤.197	.006	.004	.004
				.197–.295	.004	.002	.002
				.295–.394	.002	–	–
			DC (Slot)	≤.197	.002	.002	.002
	Heat-resistant Alloy	–	≤.25DC	≤.079	.004	.002	.002
			DC (Slot)	≤.039	.002	.002	.002
H	Hardened Steel	40–55HRC	≤.25DC	≤.197	.006	.006	.006
				.197–.295	.004	.004	.004
				.295–.394	.003	.003	.003
			.25–.5DC	≤.197	.004	.004	.004
				.197–.295	.003	.003	.003
			.5–.75DC	≤.197	.003	.003	.003
			DC (Slot)	≤.197	.003	.003	.003

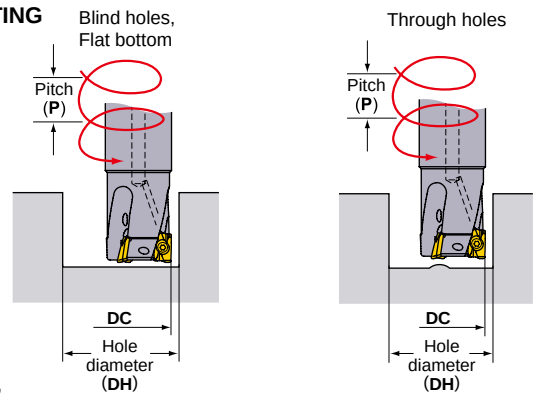
(Note 1) These cutting conditions are a guide to the standard shank type and the arbor type.
Please make adjustments according to the machining conditions.
(Note 2) Vibration is liable to occur in certain cases. Please reduce the depth of cut and / or reduce cutting conditions in the following cases.
• When using the long shank type and extra long shank type.
• When using long tool overhang with the standard or arbor type.
• When the application has poor clamping rigidity or when using a low rigidity machine.
(Note 3) In case of coarse and fine pitch cutters, the coarse pitch type is recommended to prevent vibration.
(Note 4) For heavy interrupted and unstable cutting, the H breaker is first recommendation.

RAMPING/HELICAL CUTTING

RAMPING



HELICAL CUTTING



Refer to the table below when using .031 inch radius for maximum ramping angle, pitch and minimum/maximum hole diameter. Use cutting conditions for slotting to calculate speed and feed when ramping / helical cutting.

Cutting Edge Diameter **DC** (inch)	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
	Maximum Ramping Angle **RMPX**	Minimum Distance [1] **L** (inch)	Maximum Hole Diameter [2] **DH max.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)
.750	14°	2.7	1.42	.51	1.31	.43	.80	.019
1.000	11°	3.4	1.92	.55	1.81	.47	1.30	.157
1.250	7°	5.4	2.42	.43	2.31	.39	1.80	.196
1.500	7°	5.4	2.92	.51	2.81	.47	2.30	.275
2.000	4°	9.4	3.92	.39	3.81	.39	3.30	.275
2.500	2°	18.8	4.92	.23	4.81	.23	4.30	.157
3.000	2°	18.8	5.92	.31	5.81	.27	5.30	.236
4.000	1.5°	25.1	7.92	.31	7.81	.27	7.30	.236

(Note 1) L(=.591"/tanα). Cutters' moving distance until depth of cut reaches .591" at a maximum ramping angle.
(Note 2) In case corner radius of .031". Other than that, find with the below formula.
{(cutting edge diameter DC) - (corner radius) - .008"} x 2
(Note 3) When machining highly ductile materials with ramping angles above, chips could be continuous.
In this case, decrease the ramping angle or feed per tooth.

DEEP SHOULDER MILLING

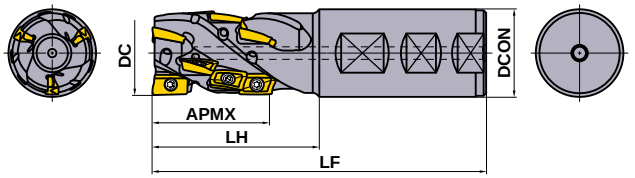
Finishing Roughing

APX4000

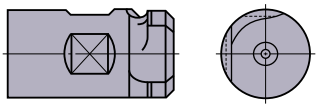
P M K N S H

LONG CUTTING EDGE





★1 Combination Type



LONG EDGE SHANK TYPE (A Holders)

Order Number	Stock	Number of Flutes	Total	Dimensions (inch)					★2			
	R			DC	DCON	LF	LH	APMX	Insert Screw	Wrench	Anti-seizure Lubricant	Insert
APX4KUR2408WA24S35A	●	2	8	1.500	1.500	6.500	3.250	2.200	TPS43	TIP15W	MK1KS	AOMT1848 ○○PEER-○
APX4KUR2412WA24S35A	●	3	12	1.500	1.500	6.500	3.250	2.200	TPS43	TIP15W	MK1KS	
★1 APX4KUR3212WA32S35A	●	3	12	2.000	2.000	6.500	3.250	2.200	TPS43	TIP15W	MK1KS	
★1 APX4KUR3218WA32M53A	●	3	18	2.000	2.000	7.750	4.500	3.300	TPS43	TIP15W	MK1KS	

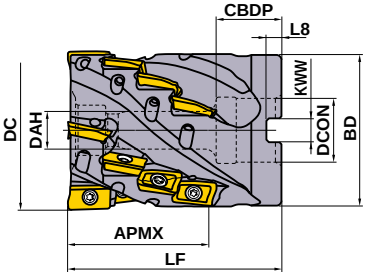
★2 Clamp Torque (lbf-in) : TPS43=31

(Note 1) When using inserts with corner radius RE≥.125" on the bottom, B-Holders or C-Holders are required as shown on page K057.

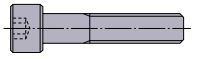
(Note 2) Only corner radius RE .016" and .031" can be used for the peripheral cutting edges expect the bottom cutting edge (the end cuttting edge).

(Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.





Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ2.000"	HSCUF37520	
ϕ2.500"	HSCUF50028	

LONG EDGE SHELL TYPE (A Holders)

Order Number	Stock	Number of Flutes	Total	Dimensions (mm)									★			
	R			DC	LF	DCON	CBDP	DAH	BD	KWW	L8	APMX	Insert Screw	Wrench	Anti-seizure Lubricant	Insert
APX4KUR0209A16A	●	3	9	2.000	2.500	.750	1.063	.415	1.918	.313	.187	1.650	TPS43	TIP15W	MK1KS	AOMT1848 ○○PEER-○
APX4KUR2516CA22A	●	4	16	2.500	3.500	1.000	1.339	.539	2.409	.375	.219	2.200	TPS43	TIP15W	MK1KS	

★ Clamp Torque (lbf-in) : TPS43=31

(Note 1) When using inserts with corner radius Re≥.125" on the bottom, B-Holders or C-Holders are required as shown on page K057.

(Note 2) Only corner radius Re .016" and .031" can be used for the peripheral cutting edges expect the bottom cutting edge (the end cuttting edge).

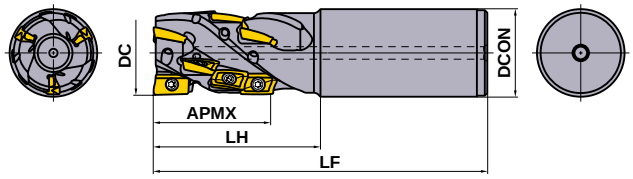
(Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

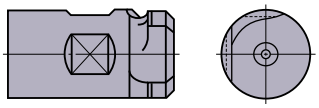
(Note 4) In case of internal coolant supply, please use a face mill arbor with through coolant channels. Regular center-thru or side-thru arbors can't be used.

(Note 5) The cutter body includes a set bolt for an arbor.

● : Inventory maintained. ★ : Inventory maintained in Japan.







∗1 Combination Type

METRIC Standard

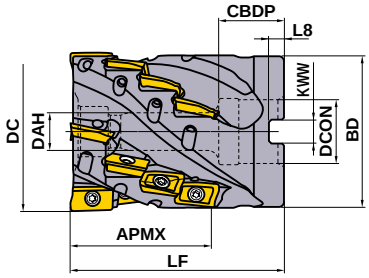
LONG EDGE SHANK TYPE (A Holders)

Order Number	Stock	Number of Flutes	Total	Dimensions (mm) [inch]					∗2			
	R			DC	DCON	LF	LH	APMX	Insert Screw	Wrench	Anti-seizure Lubricant	Insert
APX4KR4008SA42S056A	★	2	8	40	42	160	80	56	TPS43	TIP15W	MK1KS	AOMT1848 ○○PEER-○
APX4KR4012SA42S056A	★	3	12	40	42	160	80	56	TPS43	TIP15W	MK1KS	
∗1 APX4KR5012WA508S056A	★	3	12	50	50.8 [2.0"]	160	80	56	TPS43	TIP15W	MK1KS	
∗1 APX4KR5018WA508M084A	★	3	18	50	50.8 [2.0"]	190	110	84	TPS43	TIP15W	MK1KS	

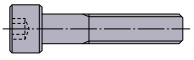
∗2 Clamp Torque (lbf-in) : TPS43=31

(Note 1) When using inserts with corner radius RE≥.125" on the bottom, B-Holders or C-Holders are required as shown on page K057.
(Note 2) Only corner radius RE .016" and .031" can be used for the peripheral cutting edges expect the bottom cutting edge (the end cuttting edge).
(Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.





Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ50mm	HSC10050	
ϕ63mm	HSC12070	

The bore diameter (DCON) is equivalent to a metric size.

METRIC Standard For inch arbors

LONG EDGE SHELL TYPE (A Holders)

Order Number	Stock	Number of Flutes	Total	Dimensions (mm) [inch]									∗			
	R			DC	LF	DCON	CBDP	DAH	BD	KWW	L8	APMX	Insert Screw	Wrench	Anti-seizure Lubricant	Insert
APX4KR06316CA056A	★	4	16	63	85	25.4 [1.0"]	26	13	60.7	9.5	6	56	TPS43	TIP15W	MK1KS	AOMT1848 ○○PEER-○

∗ Clamp Torque (lbf-in) : TPS43=31

METRIC Standard For metric arbors

LONG EDGE SHELL TYPE (A Holders)

Order Number	Stock	Number of Flutes	Total	Dimensions (mm)									∗			
	R			DC	LF	DCON	CBDP	DAH	BD	KWW	L8	APMX	Insert Screw	Wrench	Anti-seizure Lubricant	Insert
APX4K-050A09A042RA	★	3	9	50	65	22	22	11	48	10.4	6.3	42	TPS43	TIP15W	MK1KS	AOMT1848 ○○PEER-○
APX4K-063A16A056RA	★	4	16	63	85	27	28	13	60.7	12.4	7	56	TPS43	TIP15W	MK1KS	

∗ Clamp Torque (lbf-in) : TPS43=31

(Note 1) When using inserts with corner radius RE≥.125" on the bottom, B-Holders or C-Holders are required as shown on page K057.
(Note 2) Only corner radius RE .016" and .031" can be used for the peripheral cutting edges expect the bottom cutting edge (the end cuttting edge).
(Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
(Note 4) In case of internal coolant supply, please use a face mill arbor with through coolant channels. Regular center-thru or side-thru arbors can't be used.
(Nota 5) Set bolt not included.

INSERTS	➤ K057
OPERATION GUIDANCE	➤ K063
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED

	Work Material	Hardness	Insert Grade 1st Recommenedation	Insert Grade 2nd Recommenedation	Breaker		Cutting Width **ae** (inch) ≤0.15DC	0.15—0.3DC	DC (Slot)
							Cutting Speed **vc** (SFM)		
P	Mild Steel	≤180HB	MP6120	VP15TF	M	H	655(525—820)	525(395—655)	460(395—525)
			MP6130	VP20RT	M	H	560(425—720)	425(295—560)	360(295—425)
	Carbon Steel Alloy Steel	180—350HB	MP6120	VP15TF	M	H	525(395—655)	395(330—460)	330(260—395)
			MP6130	VP20RT	M	H	425(295—560)	295(230—360)	230(165—295)
M	Stainless Steel	≤270HB	MP7130	VP15TF	M	H	525(395—655)	395(330—460)	330(260—395)
K	Gray Cast Iron	≤350MPa	MC5020	VP15TF	H		755(590—920)	620(460—785)	620(460—785)
	Ductile, Cast Iron	≤800MPa	MC5020	VP15TF	H		620(460—720)	560(395—720)	560(395—720)
S	Titanium Alloy	≤350HB	MP9120	VP15TF	H	M	165(130—230)		165(130—230)
			MP9130	VP20RT	H	M	130(100—195)		130(100—195)
	Heat-resistant Alloy	—	MP9120	VP15TF	H	M	130(100—195)		130(100—195)
			MP9130	VP20RT	H	M	100(65—130)		100(65—130)

DEPTH OF CUT / FEED PER TOOTH

	Work Material	Hardness	Cutting Width **ae** (inch)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (IPT) Cutter Diameter (inch) ϕ1.5"(Max.ap=2.2") ϕ2.0"(Max.ap=1.65") ϕ40(Max.ap=56mm(2.205") ϕ50 (Max.ap=42mm(1.654")	ϕ2.0"(Max.ap=2.2") ϕ2.5"(Max.ap=2.2") ϕ50(Max.ap=56mm(2.205") ϕ63 (Max.ap=56mm(2.205")	ϕ2.0"(Max.ap=3.3") ϕ50(Max.ap=84mm(3.307")
P	Mild Steel	≤180HB	≤ .3DC	≤.787	.010	.010	.008
				.787—1.969	.008	.008	.006
				1.969—3.150			.004
			DC (Slot)	≤.787	.008	.008	.006
				.787—1.969	.006	.006	
	Carbon Steel Alloy Steel	180—350HB	≤ .3DC	≤.787	.010	.010	.008
				.787—1.969	.008	.008	.006
				1.969—3.150			.004
			DC (Slot)	≤.787	.006	.006	.004
				.787—1.969	.004	.004	
M	Stainless Steel	≤270HB	≤ .3DC	≤.787	.010	.010	.008
				.787—1.969	.008	.008	.006
				1.969—3.150			.004
			DC (Slot)	≤.394	.004	.004	.003
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤ .15DC	≤.394	.012	.012	.010
				.394—1.969	.010	.010	.008
				1.969—3.150			.006
			.15—.3DC	≤.394	.010	.010	.008
				.394—1.969	.008	.008	.006
				1.969—3.150			.004
			DC (Slot)	≤.394	.010	.010	.008
				.394—1.969	.008	.008	.006
	Ductile, Cast Iron	Tensile Strength ≤800MPa	≤ .15DC	≤.787	.010	.010	.008
				.787—1.969	.008	.008	.006
				1.969—3.150			.004
			.15—.3DC	≤.787	.008	.008	.006
				.787—1.969	.006	.006	.004
				1.969—3.150			.003
			DC (Slot)	≤.394	.006	.006	.004
				.394—1.969	.004	.004	
S	Titanium Alloy	≤350HB	≤ .15DC	≤.787	.004	.004	
				.787—1.969	.004	.004	
			DC (Slot)	≤1.969	.003	.003	
	Heat-resistant Alloy	—	≤ .15DC	≤.394	.003	.003	
			DC (Slot)	≤.787	.002	.002	

(Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust processing conditions if the vibration is generated.

OPERATIONAL GUIDANCE

- Use only specified inserts and parts.
- Clamp the inserts at a specified torque of only.
- The maximum allowable spindle speeds are shown in Table 1. Ensure that the cutter operates under the maximum allowable spindle speed.
  The maximum allowable spindle speeds for safety purposes are determined in accordance with ISO15641 (Milling Cutters for high speed machining–Safety requirements).

(Table 1) Maximum allowable spindle speed

Cutting Edge Diameter (inch)	ϕ.500"	ϕ.625"	ϕ.750"	ϕ1.000"	ϕ1.250"	ϕ1.500"	ϕ2.000"	ϕ2.500"	ϕ3.000"	ϕ4.000"
Max. Allowable Spindle Speed (min^{-1})	9900	19000	16000	12000	9500	7600	6000	4800	3800	3100

Cutting Edge Diameter **DC**(mm)	ø12	ø14	ø16	ø18	ø20	ø22	ø25	ø28	ø30
Max. Allowable Spindle Speed (min^{-1})	—	—	19000	17000	15000	14000	12000	11000	10000

Cutting Edge Diameter **DC**(mm)	ø32	ø35	ø40	ø50	ø63	ø80	ø100	ø125	ø160
Max. Allowable Spindle Speed (min^{-1})	9500	9000	7500	6000	5000	3500	3000	2500	1500

MULTI FUNCTIONAL MILLING
<CUTTING FOR ALUMINUM ALLOY>

Finishing Roughing

AXD4000

P M K **N** S H



Fig. 1

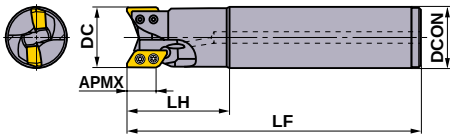
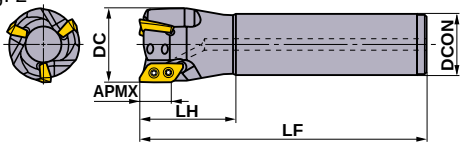


Fig. 2



SHANK TYPE

Right hand tool holder only.

Type	RE	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	LF	LH	DCON	APMX (inch)	Max. Spindle Speed (min^{-1})	Type (Fig.)	Insert Screw *	Wrench	Anti-seize Lubricant	Insert
A Holders	.016 | .125	**AXD4000UR162SA12SA**	●	2	1.000	6.000	2.000	.750	.610	49000	2	TS3SB	TKY08D	MK1KS	XDGX1750◌◌ PD◌R-◌◌
		AXD4000UR**162SA16SA**	●	2	1.000	6.000	2.000	1.000	.610	49000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR**162SA16LA**	●	2	1.000	8.500	3.000	1.000	.610	49000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR**202SA20SA**	●	2	1.250	6.000	2.000	1.250	.610	48000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR**202SA20LA**	●	2	1.250	9.000	3.500	1.250	.610	48000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR**243SA20SA**	●	3	1.500	6.000	2.000	1.250	.610	41000	2	TS3SB	TKY08D	MK1KS	
		AXD4000UR**243SA20LA**	●	3	1.500	9.000	2.000	1.250	.610	41000	2	TS3SB	TKY08D	MK1KS	
B Holders	.157 .197	**AXD4000UR162SA12SB**	●	2	1.000	6.000	2.000	.750	.583	49000	2	TS3SB	TKY08D	MK1KS	
		AXD4000UR**162SA16SB**	●	2	1.000	6.000	2.000	1.000	.583	49000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR**162SA16LB**	●	2	1.000	8.500	3.000	1.000	.583	49000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR**202SA20SB**	●	2	1.250	6.000	2.000	1.250	.583	48000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR**202SA20LB**	●	2	1.250	9.000	3.500	1.250	.583	48000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR**243SA20SB**	●	3	1.500	6.000	2.000	1.250	.583	41000	2	TS3SB	TKY08D	MK1KS	
		AXD4000UR**243SA20LB**	●	3	1.500	9.000	2.000	1.250	.583	41000	2	TS3SB	TKY08D	MK1KS	

1. The maximum spindle speeds are set to ensure tool and insert stability.
   Before operating this tool read the operation guidance on page K071.
2. When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
3. Note for insert with a corner radius of .063" and above, as corner radius increases the LF and LH dimension decreases.

* Clamp Torque (lbf-in) : TS3SB=13

● : Inventory maintained. □ : Non stock, produced to order only.



Fig. 1

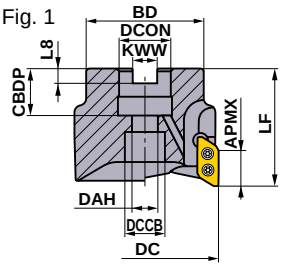
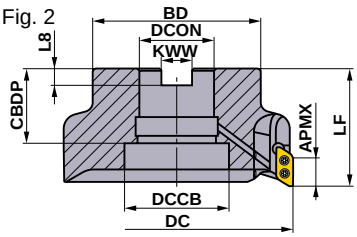


Fig. 2



Right hand tool holder only.

Cutter Diameter DC	Set Bolt	Geometry
ϕ1.5"	HSCU25014H	① ②
ϕ2"	HSCU37513H	
ϕ2.5"	HSCU50014H	①
ϕ3"	HSCU62516H	
ϕ4"	HSCU75016H	
ϕ5"	MBAU75016H	②

KAPR :0°
GAMP :+14°—15° T :+21°—+26°
GAMF :+21°—+26° I :+14°—+15°

ARBOR TYPE

Type	RE	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	LF	DCON	CBDP	DAH	BD	KWW	L8	DCCB	✶2 WT (lbs)	APMX (inch)	Max. Spindle Speed (min⁻¹)	Type (Fig.)	✶1 Insert Screw	Wrench	Anti-seize Lubricant	Insert
A Holders	.016 I .125	AXD4000UR1502A	●	2	1.500	2.000	.500	.630	.276	1.440	.250	.156	.433	.6	.610	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR1503A	●	3	1.500	2.000	.500	.630	.276	1.440	.250	.156	.433	.6	.610	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR0202A	●	2	2.000	2.000	.750	.748	.413	1.750	.313	.187	.630	.9	.610	35000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR0203A	●	3	2.000	2.000	.750	.748	.413	1.750	.313	.187	.630	.9	.610	35000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR0204A	●	4	2.000	2.000	.750	.748	.413	1.750	.313	.187	.630	.9	.610	35000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR2504CA	●	4	2.500	2.000	1.000	.984	.539	2.190	.375	.219	.787	1.4	.610	30000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR0303DA	●	3	3.000	2.500	1.250	1.260	.669	2.880	.500	.281	1.024	2.9	.610	27000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR0305DA	●	5	3.000	2.500	1.250	1.260	.669	2.880	.500	.281	1.024	2.9	.610	27000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR0404EA	●	4	4.000	2.500	1.500	1.181	.787	3.810	.625	.375	1.181	5.5	.610	23000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR0406EA	●	6	4.000	2.500	1.500	1.181	.787	3.810	.625	.375	1.181	5.5	.610	23000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR0505EA	●	5	5.000	2.500	1.500	1.575	—	3.810	.625	.375	2.205	6.7	.610	20000	2	TS3SB	TKY08D	MK1KS	
		AXD4000UR0507EA	●	7	5.000	2.500	1.500	1.575	—	3.810	.625	.375	2.205	6.7	.610	20000	2	TS3SB	TKY08D	MK1KS	XDGX1750◌◌ PD◌R-◌◌
B Holders	.157 I .197	AXD4000UR1502B	□	2	1.500	2.000	.500	.630	.276	1.440	.250	.156	.433	.6	.583	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR1503B	●	3	1.500	2.000	.500	.630	.276	1.440	.250	.156	.433	.6	.583	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR0202B	□	2	2.000	2.000	.750	.748	.413	1.750	.313	.187	.630	.9	.583	35000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR0203B	□	3	2.000	2.000	.750	.748	.413	1.750	.313	.187	.630	.9	.583	35000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR0204B	●	4	2.000	2.000	.750	.748	.413	1.750	.313	.187	.630	.9	.583	35000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR2504CB	□	4	2.500	2.000	1.000	.984	.539	2.190	.375	.219	.787	1.4	.583	30000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR0303DB	□	3	3.000	2.500	1.250	1.260	.669	2.880	.500	.281	1.024	2.9	.583	27000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR0305DB	●	5	3.000	2.500	1.250	1.260	.669	2.880	.500	.281	1.024	2.9	.583	27000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR0404EB	□	4	4.000	2.500	1.500	1.181	.787	3.810	.625	.375	1.181	5.5	.583	23000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR0406EB	□	6	4.000	2.500	1.500	1.181	.787	3.810	.625	.375	1.181	5.5	.583	23000	1	TS3SB	TKY08D	MK1KS	
		AXD4000UR0505EB	□	5	5.000	2.500	1.500	1.575	—	3.810	.625	.375	2.205	6.7	.583	20000	2	TS3SB	TKY08D	MK1KS	
		AXD4000UR0507EB	□	7	5.000	2.500	1.500	1.575	—	3.810	.625	.375	2.205	6.7	.583	20000	2	TS3SB	TKY08D	MK1KS	

(Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating this tool read the operation guidance on page K071.
(Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
(Note 3) Note for insert with a corner radius of .063" and above, as corner radius increases the LF dimension decreases.
✶1 Clamp Torque (lbf-in) : TS3SB=13
✶2 WT : Mass
✶3 The cutter body includes a set bolt for an arbor.

MILLING

INSERTS ➤ K069
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig. 1

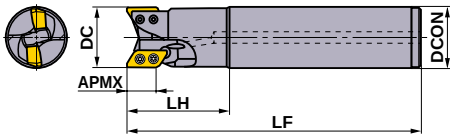
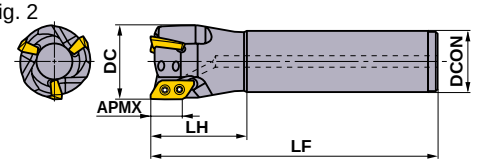


Fig. 2



METRIC Standard

SHANK TYPE

Right hand tool holder only.

Type	RE	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	LH	DCON	APMX (mm)	Max. Spindle Speed (min^{-1})	Type (Fig.)	Clamp Screw *	Wrench	Anti-seize Lubricant	Insert
A Holders	0.4 – 3.2	NEW AXD4000R201SA20SA	★	1	20	110	35	20	15.5	15000	1	TS3SBS	TKY08D	MK1KS	XDGX1750◯◯ PD◯R-◯◯
		AXD4000R252SA25SA	★	2	25	125	50	25	15.5	49000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R252SA25LA	★	2	25	170	80	25	15.5	49000	1	TS3SB	TKY08D	MK1KS	
		NEW AXD4000R282SA25SA	★	2	28	125	50	25	15.5	48500	2	TS3SB	TKY08D	MK1KS	
		NEW AXD4000R282SA25ELA	★	2	28	220	50	25	15.5	48500	2	TS3SB	TKY08D	MK1KS	
		AXD4000R322SA32SA	★	2	32	150	50	32	15.5	48000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R322SA32LA	★	2	32	200	80	32	15.5	48000	1	TS3SB	TKY08D	MK1KS	
		NEW AXD4000R352SA32SA	★	2	35	150	50	32	15.5	45000	2	TS3SB	TKY08D	MK1KS	
		NEW AXD4000R352SA32ELA	★	2	35	250	50	32	15.5	45000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R403SA32SA	★	3	40	150	50	32	15.5	41000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R403SA42SA	★	3	40	170	80	42	15.5	41000	1	TS3SB	TKY08D	MK1KS	
		NEW AXD4000R403SA32ELA	★	3	40	250	50	32	15.5	41000	2	TS3SB	TKY08D	MK1KS	
B Holders	4.0 – 5.0	NEW AXD4000R201SA20SB	★	1	20	110	35	20	14.8	15000	1	TS3SBS	TKY08D	MK1KS	
		AXD4000R252SA25SB	★	2	25	125	50	25	14.8	49000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R252SA25LB	★	2	25	170	80	25	14.8	49000	1	TS3SB	TKY08D	MK1KS	
		NEW AXD4000R282SA25SB	★	2	28	125	50	25	14.8	48500	2	TS3SB	TKY08D	MK1KS	
		NEW AXD4000R282SA25ELB	★	2	28	220	50	25	14.8	48500	2	TS3SB	TKY08D	MK1KS	
		AXD4000R322SA32SB	★	2	32	150	50	32	14.8	48000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R322SA32LB	★	2	32	200	80	32	14.8	48000	1	TS3SB	TKY08D	MK1KS	
		NEW AXD4000R352SA32SB	★	2	35	150	50	32	14.8	45000	2	TS3SB	TKY08D	MK1KS	
		NEW AXD4000R352SA32ELB	★	2	35	250	50	32	14.8	45000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R403SA32SB	★	3	40	150	50	32	14.8	41000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R403SA42SB	★	3	40	170	80	42	14.8	41000	1	TS3SB	TKY08D	MK1KS	
		NEW AXD4000R403SA32ELB	★	3	40	250	50	32	14.8	41000	2	TS3SB	TKY08D	MK1KS	

(Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operation guidance on page K071.
(Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
(Note 3) Note for insert with a corner radius of .063" and above, as corner radius increases the LF and LH dimension decreases.
* Clamp Torque (lbf-in) : TS3SBS=13, TS3SB=13

★ : Inventory maintained in Japan.



Fig. 1

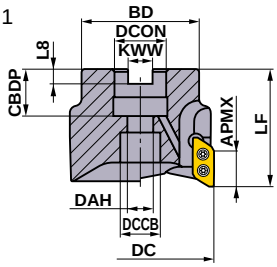
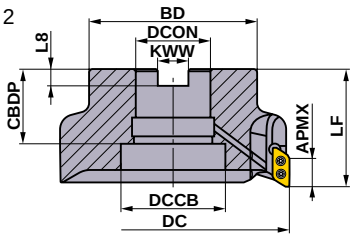


Fig. 2

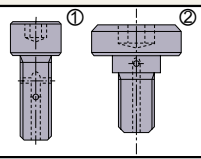


METRIC Standard

For inch arbors

Right hand tool holder only.

Cutter Diameter DC	Set Bolt	Geometry
ϕ80	12035H	①
ϕ100	16040H	
ϕ125	MBA20040H	②



ARBOR TYPE

KAPR :0°
GAMP :+14°—15° T :+21°—+26°
GAMF :+21°—+26° I :+14°—+15°

Type	RE	Order Number	Stock R	Number of Teeth	DC	LF	DCON	CBDP	DAH	BD	KWW	L8	DCCB	✶2 WT (kg)	APMX (mm)	Max. Spindle Speed (min⁻¹)	Type (Fig.)	✶1 Insert Screw	Wrench	Anti-seize Lubricant	Insert
A Holders	0.4 I 3.2	AXD4000R08005CA	★	5	80	50	25.4 [1.0"]	26	13	60	9.5	6	20	1.0	15.5	27000	1	TS3SB	TKY08D	MK1KS	XDGX1750□□ PD□R-□□
		AXD4000R10006DA	★	6	100	63	31.75 [1.25"]	32	17	70	12.7	8	26	2.0	15.5	23000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R12507EA	★	7	125	63	38.1 [1.5"]	40	—	90	15.9	10	56	2.8	15.5	20000	2	TS3SB	TKY08D	MK1KS	
B Holders	4.0 I 5.0	AXD4000R08005CB	★	5	80	50	25.4 [1.0"]	26	13	60	9.5	6	20	1.0	14.8	27000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R10006DB	★	6	100	63	31.75 [1.25"]	32	17	70	12.7	8	26	2.0	14.8	23000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R12507EB	★	7	125	63	38.1 [1.5"]	40	—	90	15.9	10	56	2.8	14.8	20000	2	TS3SB	TKY08D	MK1KS	

(Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating this tool read the operation guidance on page K071.
(Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
(Note 3) Note for inserts with a corner radius of .063" and above, as corner radius increases the LF dimension decreases.
✶1 Clamp Torque (lbf-in) : TS3SB=13
✶2 WT : Mass
✶3 Set bolt not included.

MILLING

INSERTS ➤ K069
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig. 1

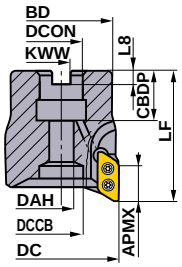


Fig. 2

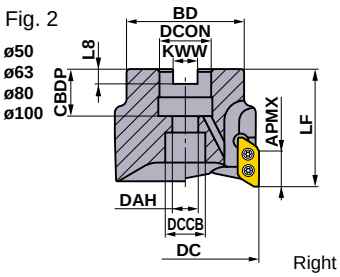
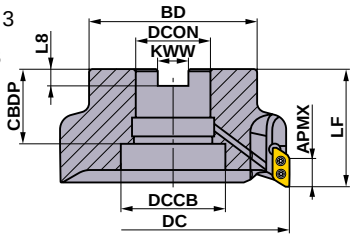
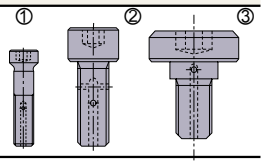


Fig. 3



Right hand tool holder only.

Cutter Diameter DC	Set Bolt	Geometry
ϕ40	HFF08043H	①
ϕ50, ϕ63	HSC10030H	②
ϕ80	HSC12035H	②
ϕ100	HSC16040H	②
ϕ125	MBA20040H	③



METRIC Standard

For metric arbors

KAPR :0°
GAMP :+14°—15° T :+21°—+26°
GAMF :+21°—+26° I :+14°—+15°

ARBOR TYPE

Type	RE	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	DCON	CBDP	DAH	BD	KWW	L8	DCCB	★2 WT (kg)	APMX (mm)	Max. Spindle Speed (min⁻¹)	Type (Fig.)	★1 Clamp Screw	Wrench	Anti-seize Lubricant	Insert
A Holders	0.4 I 3.2	AXD4000-040A02RA	★	2	40	50	16	18	8.5	34	8.4	5.6	12	0.3	15.5	41000	1	TS3SB	TKY08D	MK1KS	XDGX1750□□ PD□R-□□
		AXD4000-040A03RA	★	3	40	50	16	18	8.5	34	8.4	5.6	12	0.3	15.5	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000-050A02RA	★	2	50	50	22	20	11	45	10.4	6.3	17	0.4	15.5	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-050A04RA	★	4	50	50	22	20	11	45	10.4	6.3	17	0.4	15.5	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-063A05RA	★	5	63	50	22	20	11	50	10.4	6.3	17	0.6	15.5	30000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-080A05RA	★	5	80	50	27	23	13	60	12.4	7	20	1.0	15.5	27000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-100A06RA	★	6	100	63	32	26	17	70	14.4	8	26	2.0	15.5	23000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-125B07RA	★	7	125	63	40	40	—	90	16.4	9	56	2.8	15.5	20000	3	TS3SB	TKY08D	MK1KS	
B Holders	4.0 I 5.0	AXD4000-040A02RB	★	2	40	50	16	18	8.5	34	8.4	5.6	12	0.3	14.8	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000-040A03RB	★	3	40	50	16	18	8.5	34	8.4	5.6	12	0.3	14.8	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000-050A02RB	★	2	50	50	22	20	11	45	10.4	6.3	17	0.4	14.8	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-050A04RB	★	4	50	50	22	20	11	45	10.4	6.3	17	0.4	14.8	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-063A05RB	★	5	63	50	22	20	11	50	10.4	6.3	17	0.6	14.8	30000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-080A05RB	★	5	80	50	27	23	13	60	12.4	7	20	1.0	14.8	27000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-100A06RB	★	6	100	63	32	26	17	70	14.4	8	26	2.0	14.8	23000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-125B07RB	★	7	125	63	40	40	—	90	16.4	9	56	2.8	14.8	20000	3	TS3SB	TKY08D	MK1KS	

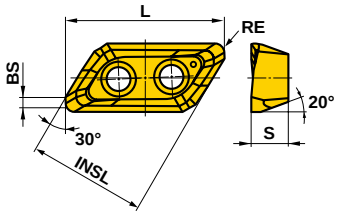
(Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operation guidance on page K071.
(Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
(Note 3) Note for insert with a corner radius of .063" and above, as corner radius increases the LF dimension decreases.
★1 Clamp Torque (lbf-in) : TS3SB=13
★2 WT : Mass
★3 Set bolt not included.

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

INSERTS

Work Material		
	N	Non-Ferrous Metal
	S	Heat-resistant Alloy, Titanium Alloy

Cutting Conditions (Guide): ● :Stable Cutting ◐ :General Cutting ✣ :Unstable Cutting
Honing: **F** :Sharp

Shape	Order Number	Class	Honing	Stock: Coated LC15TF	Stock: Coated MP9120 (NEW)	Stock: Carbide TF15	Dimensions (inch) L	INSL	S	BS	RE	Geometry
	**XDGX175004PDFR-GL**	G	F	★		●	.906	.689	.197	.067	.016	
	XDGX**175008PDFR-GL**	G	F	★		●	.906	.689	.197	.051	.031	
	XDGX**175012PDFR-GL**	G	F	★		●	.906	.689	.197	.035	.047	
	XDGX**175016PDFR-GL**	G	F	★		●	.866	.689	.197	.055	.063	
	XDGX**175020PDFR-GL**	G	F	★		●	.866	.689	.197	.039	.079	
	XDGX**175024PDFR-GL**	G	F	★		●	.866	.689	.197	.024	.094	
	XDGX**175030PDFR-GL**	G	F	★		●	.831	.689	.197	.031	.118	
	XDGX**175032PDFR-GL**	G	F	★		●	.831	.689	.197	.024	.125	
	XDGX**175040PDFR-GL**	G	F	★		●	.787	.689	.197	.031	.157	
	XDGX**175050PDFR-GL**	G	F	★		●	.764	.689	.197	.016	.197	
(NEW) 	**XDGX175004PDER-GM**	G	E		●		.906	.689	.197	.067	.016	
	XDGX**175008PDER-GM**	G	E		●		.906	.689	.197	.051	.031	
	XDGX**175012PDER-GM**	G	E		●		.906	.689	.197	.035	.047	
	XDGX**175016PDER-GM**	G	E		●		.866	.689	.197	.055	.063	
	XDGX**175020PDER-GM**	G	E		●		.866	.689	.197	.039	.079	
	XDGX**175024PDER-GM**	G	E		●		.866	.689	.197	.024	.094	
	XDGX**175030PDER-GM**	G	E		●		.831	.689	.197	.031	.118	
	XDGX**175032PDER-GM**	G	E		●		.831	.689	.197	.024	.125	
	XDGX**175040PDER-GM**	G	E		●		.787	.689	.197	.019	.157	
	XDGX**175050PDER-GM**	G	E		●		.764	.689	.197	.016	.197	
(NEW) 	**XDGX175004PDFR-GM**	G	F			●	.906	.689	.197	.067	.016	
	XDGX**175008PDFR-GM**	G	F			●	.906	.689	.197	.051	.031	
	XDGX**175012PDFR-GM**	G	F			●	.906	.689	.197	.035	.047	
	XDGX**175016PDFR-GM**	G	F			●	.866	.689	.197	.055	.063	
	XDGX**175020PDFR-GM**	G	F			●	.866	.689	.197	.039	.079	
	XDGX**175024PDFR-GM**	G	F			●	.866	.689	.197	.024	.094	
	XDGX**175030PDFR-GM**	G	F			●	.831	.689	.197	.031	.118	
	XDGX**175032PDFR-GM**	G	F			●	.831	.689	.197	.024	.125	
	XDGX**175040PDFR-GM**	G	F			●	.787	.689	.197	.019	.157	
	XDGX**175050PDFR-GM**	G	F			●	.764	.689	.197	.016	.197	

Please note that the insert nose R differs from radius form which is remains on work material after machining due to the effects of the axial rake angle at the time of setting.

■ = MIRACLE SIGMA

HOLDER AND INSERT CORNER RADIUS COMBINATION

Holder	**A** Holder	**B** Holder
	(Inch) **AXD4000UR○○○○○A** **AXD4000UR○○○○○○○A** **(Metric)** **AXD4000–○○○○○○○A** **AXD4000R○○○○○○○A**	**(Inch)** **AXD4000UR○○○○○B** **AXD4000UR○○○○○○○B** **(Metric)** **AXD4000–○○○○○○○B** **AXD4000R○○○○○○○B**

Insert Corner Radius (RE)	.016"	.031"	.047"	.063"	.079"	.094"	.118"	.125"	.157"	.197"
	XDGX 175004PD R-○○	XDGX 175008PD R-○○	XDGX 175012PD R-○○	XDGX 175016PD R-○○	XDGX 175020PD R-○○	XDGX 175024PD R-○○	XDGX 175030PD R-○○	XDGX 175032PD R-○○	XDGX 175040PD R-○○	XDGX 175050PD R-○○

(Note) Other combinations of holder and insert corner R are not acceptable.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

	Work Material	Insert Grade	Breaker	Cutting Speed **vc** (SFM)	Width of Cut **ae** (inch)	Depth of Cut **ap** (inch)	Feed per Tooth (inch/tooth) Cutting Edge Diameter **DC** ϕ.787"	ϕ1.000"	ϕ1.250"	ϕ1.500"	ϕ2.000–ϕ5.000"
N	Aluminum Alloy **Si<5%**	**LC15TF TF15 MP9120**	**GL GM**	3300 (660–9800)	–.25 DC	–.197	≤ .002	≤ .014	≤ .014	≤ .016	≤ .016
						.197–.295	≤ .002	≤ .013	≤ .013	≤ .015	≤ .015
						.295–.393	≤ .002	≤ .012	≤ .012	≤ .014	≤ .014
						.393–.492	≤ .002	≤ .011	≤ .011	≤ .013	≤ .013
						.492–.571	≤ .002	≤ .010	≤ .010	≤ .012	≤ .012
				3300 (660–9800)	–.5 DC	–.197	≤ .002	≤ .014	≤ .014	≤ .014	≤ .016
						.197–.295	≤ .002	≤ .013	≤ .013	≤ .013	≤ .015
						.295–.393	–	≤ .012	≤ .012	≤ .012	≤ .014
						.393–.492	–	≤ .010	≤ .011	≤ .011	≤ .013
						.492–.571	–	≤ .008	≤ .010	≤ .010	≤ .012
				3300 (660–9800)	–.75 DC	–.197	≤ .002	≤ .012	≤ .012	≤ .012	≤ .014
						.197–.295	≤ .002	≤ .011	≤ .011	≤ .011	≤ .013
						.295–.393	–	≤ .010	≤ .010	≤ .010	≤ .012
						.393–.492	–	≤ .009	≤ .009	≤ .009	≤ .011
						.492–.571	–	≤ .008	≤ .008	≤ .008	≤ .010
				3300 (660–9800)	DC(Slot)	–.197	≤ .002	≤ .010	≤ .010	≤ .012	≤ .014
						.197–.295	≤ .002	≤ .009	≤ .009	≤ .011	≤ .013
						.295–.393	–	≤ .008	≤ .008	≤ .010	≤ .012
						.393–.492	–	–	≤ .007	≤ .009	≤ .011
						.492–.571	–	–	≤ .006	≤ .008	≤ .010
	Aluminum Alloy **5% ≤ Si ≤ 10% Si>10%**	**LC15TF TF15 MP9120**	**GL GM**	660 (660–9800)	–.25 DC	–.197	≤ .002	≤ .014	≤ .014	≤ .016	≤ .016
						.197–.295	≤ .002	≤ .013	≤ .013	≤ .015	≤ .015
						.295–.393	≤ .002	≤ .012	≤ .012	≤ .014	≤ .014
						.393–.492	≤ .002	≤ .011	≤ .011	≤ .013	≤ .013
						.492–.571	≤ .002	≤ .010	≤ .010	≤ .012	≤ .012
				660 (660–9800)	–.5 DC	–.197	≤ .002	≤ .014	≤ .014	≤ .014	≤ .016
						.197–.295	≤ .002	≤ .013	≤ .013	≤ .013	≤ .015
						.295–.393	–	≤ .012	≤ .012	≤ .012	≤ .014
						.393–.492	–	≤ .010	≤ .011	≤ .011	≤ .013
						.492–.571	–	≤ .008	≤ .010	≤ .010	≤ .012
				660 (660–9800)	–.75 DC	–.197	≤ .002	≤ .012	≤ .012	≤ .012	≤ .014
						.197–.295	≤ .002	≤ .011	≤ .011	≤ .011	≤ .013
						.295–.393	–	≤ .010	≤ .010	≤ .010	≤ .012
						.393–.492	–	≤ .009	≤ .009	≤ .009	≤ .011
						.492–.571	–	≤ .008	≤ .008	≤ .008	≤ .010
				660 (660–9800)	DC(Slot)	–.197	≤ .002	≤ .010	≤ .010	≤ .012	≤ .014
						.197–.295	≤ .002	≤ .009	≤ .009	≤ .011	≤ .013
						.295–.393	–	≤ .008	≤ .008	≤ .010	≤ .012
						.393–.492	–	–	≤ .007	≤ .009	≤ .011
						.492–.571	–	–	≤ .006	≤ .008	≤ .010

	Work Material	Insert Grade	Breaker	Cutting Speed **vc** (SFM)	Width of Cut **ae** (inch)	Depth of Cut **ap** (inch)	Feed per Tooth (inch/tooth) Cutting Edge Diameter **DC** ϕ.787"	ϕ1.000"	ϕ1.250"	ϕ1.500"	ϕ2.000–ϕ5.000"
S	Titanium Alloy	**MP9120**	**GM**	130 (100–200)	–.25 DC	–.197	≤ .002	≤ .004	≤ .004	≤ .004	≤ .004
						.197–.295	≤ .002	≤ .004	≤ .004	≤ .004	≤ .004
						.295–.393	≤ .002	≤ .004	≤ .004	≤ .004	≤ .004
						.393–.492	≤ .002	≤ .004	≤ .004	≤ .004	≤ .004
						.492–.571	≤ .002	≤ .004	≤ .004	≤ .004	≤ .004
				130 (100–200)	–.5 DC	–.197	≤ .002	≤ .003	≤ .004	≤ .004	≤ .004
						.197–.295	≤ .002	≤ .003	≤ .004	≤ .004	≤ .004
						.295–.393	–	≤ .003	≤ .004	≤ .004	≤ .004
						.393–.492	–	≤ .003	≤ .004	≤ .004	≤ .004
						.492–.571	–	≤ .003	≤ .004	≤ .004	≤ .004
				130 (100–200)	–.75 DC	–.197	≤ .002	≤ .002	≤ .003	≤ .004	≤ .004
						.197–.295	≤ .002	≤ .002	≤ .003	≤ .004	≤ .004
						.295–.393	–	≤ .002	≤ .003	≤ .004	≤ .004
						.393–.492	–	≤ .002	≤ .003	≤ .004	≤ .004
						.492–.571	–	≤ .002	≤ .003	≤ .004	≤ .004
				130 (100–200)	DC(Slot)	–.197	≤ .002	≤ .002	≤ .002	≤ .002	≤ .002
						.197–.295	≤ .002	≤ .002	≤ .002	≤ .002	≤ .002
						.295–.393	–	≤ .002	≤ .002	≤ .002	≤ .002
						.393–.492	–	≤ .002	≤ .002	≤ .002	≤ .002
						.492–.571	–	≤ .002	≤ .002	≤ .002	≤ .002

(Note 1) The above cutting conditions are determined based on high rigidity of workpiece and machine, where no vibration occurred. If vibrations occur make adjustments according to the machining conditions.
(Note 2) Vibrations may occur in the following conditions.
- When using long tool overhang.
- When pocket machining corner radii.
- When the workpiece has poor clamping rigidity or when the machine rigidity or workpiece rigidity is low, vibrations can occur easily, if so, reduce cutting conditions such as width and depth of cut and feed per tooth.

OPERATIONAL GUIDANCE

Only use the inserts and parts provided by Mitsubishi Materials with this tool. Use of the correct insert clamp screws is especially important to ensure overall tool safety. Do not use damaged or worn clamp screws.

Cutting Edge Diameter **DC**(inch)	ø.787"	ø1.000"–ø5.000"
Clamp Screw Number	TS3SBS	TS3SB
Overall Length **L**(inch)	.256	.315
Clamp Torque (lbf-in)	13	13



- When tightening the clamp screws, follow the order in Figure 1.
- The maximum allowable spindle speeds are shown in Table 1. Ensure that the cutter operates under the maximum allowable spindle speed.
  The maximum allowable spindle speeds for safety purposes are determined in accordance with ISO15641 (Milling Cutters for high speed machining–Safety requirements).

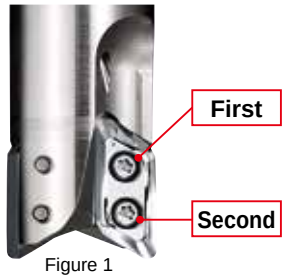


Figure 1

(Table 1) Maximum allowable spindle speed

Cutting Edge Diameter **DC**(inch)	ø.787"	ø1.000"	ø1.250"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"
Max. Allowable Spindle Speed (min^{-1})	15000	49000	48000	41000	35000	30000	27000	23000	20000

- Even when operating under the maximum allowable spindle speed, if the spindle speed is equal to or higher than the values shown in table 2, it is recommended that the balance quality (with the arbor or milling chuck) conforms to G6.3 or better based on ISO1940. It is also recommended to replace the clamp screws with new ones when changing inserts. Furthermore, ensure to use machines that are provided with safety measures in case of cutter breakage.

∗ The balance quality of the holder (without inserts and clamp screws) is G6.3 or better at 10000min^{-1}.

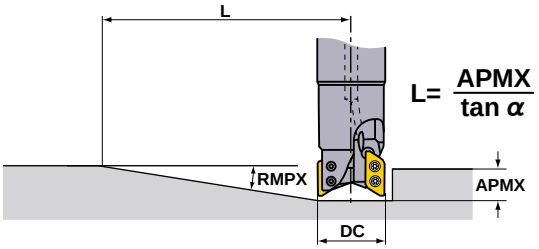
(Table 2) Maximum spindle speed when balancing with the arbor or milling chuck has not been achieved

Cutting Edge Diameter **DC**(inch)	ø.787"	ø1.000"	ø1.250"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"
Max. Spindle Speed (min^{-1})	15000	12000	9500	7600	6000	4800	3800	3000	2400

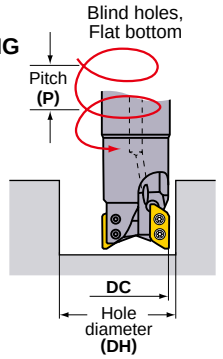
- When setting the spindle speed, take into consideration the maximum allowable spindle speed of the arbor or milling chuck.
- Use the specified set bolt when using the arbor type with through coolant.
- The inserts have sharp cutting edges and handling them with bare hands may cause injuries. Always wear safety gloves when handling the indexable inserts.

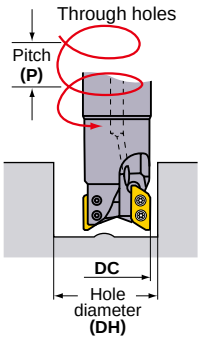
RAMPING/HELICAL CUTTING

RAMPING



HELICAL CUTTING





RAMPING/HELICAL CUTTING

Holder Type	Cutting Edge Diameter **DC** (inch)	Insert Corner Radius **RE** (inch)	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
			Maximum Ramping Angle **RMPX**	Minimum Distance **L** ✱1 (inch)	Maximum Hole Diameter **DH max.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)
A	.787	.016–.047	20.7°	1.65	1.524 ✱2	.551	1.421	.551	.866	.079
		.063–.094	19.9°	1.69	1.429 ✱3	.512	1.362	.512	.866	.079
		.118–.125	18.9°	1.81	1.319 ✱4	.472	1.311	.472	.866	.039
	1.000	.016–.047	22.6°	1.50	1.949 ✱2	.551	1.832	.551	1.267	.315
		.063–.094	22.1°	1.54	1.854 ✱3	.512	1.766	.512	1.267	.315
		.118–.125	20.7°	1.65	1.728 ✱4	.472	1.707	.472	1.267	.315
	1.102	.016–.047	19.2°	1.77	2.154 ✱2	.551	2.047	.551	1.417	.315
		.063–.094	18.5°	1.85	2.059 ✱3	.512	1.984	.512	1.417	.315
		.118–.125	16.7°	2.05	1.949 ✱4	.472	1.925	.472	1.417	.276
	1.250	.016–.047	15.6°	2.20	2.449 ✱2	.551	2.331	.551	1.762	.433
		.063–.094	14.9°	2.32	2.354 ✱3	.512	2.264	.512	1.762	.394
		.118–.125	14.0°	2.48	2.244 ✱4	.472	2.203	.472	1.762	.394
	1.378	.016–.047	13.4°	2.60	2.705 ✱2	.551	2.591	.551	1.969	.433
		.063–.094	12.7°	2.71	2.610 ✱3	.512	2.531	.512	1.969	.394
		.118–.125	11.8°	2.95	2.500 ✱4	.472	2.472	.472	1.969	.354
	1.500	.016–.047	13.0°	2.68	2.933 ✱2	.551	2.827	.551	2.262	.512
		.063–.094	12.3°	2.83	2.839 ✱3	.512	2.760	.512	2.262	.512
		.118–.125	11.6°	2.99	2.728 ✱4	.472	2.701	.472	2.262	.472
	2.000	.016–.047	8.7°	4.02	3.933 ✱2	.551	3.827	.551	3.258	.551
		.063–.094	8.2°	4.25	3.839 ✱3	.512	3.757	.512	3.257	.512
		.118–.125	7.6°	4.61	3.728 ✱4	.472	3.696	.472	3.257	.472
	2.500	.016–.047	6.6°	5.28	4.933 ✱2	.551	4.824	.551	4.259	.551
		.063–.094	6.1°	5.75	4.839 ✱3	.512	4.756	.512	4.259	.512
		.118–.125	5.7°	6.14	4.728 ✱4	.472	4.695	.472	4.258	.472
	3.000	.016–.047	5.3°	6.61	5.933 ✱2	.551	5.824	.551	5.260	.551
		.063–.094	4.9°	7.13	5.839 ✱3	.512	5.756	.512	5.260	.512
		.118–.125	4.5°	7.76	5.728 ✱4	.472	5.746	.472	5.259	.472
	4.000	.016–.047	3.8°	9.21	7.933 ✱2	.551	7.824	.551	7.261	.551
		.063–.094	3.5°	10.00	7.839 ✱3	.512	7.755	.512	7.261	.512
		.118–.125	3.2°	10.94	7.728 ✱4	.472	7.694	.472	7.260	.472
	5.000	.016–.047	2.9°	12.05	9.933 ✱2	.551	9.823	.551	9.261	.551
		.063–.094	2.7°	12.95	9.839 ✱3	.512	9.755	.512	9.261	.512
		.118–.125	2.5°	14.02	9.728 ✱4	.472	9.693	.472	9.260	.472

Holder Type	Cutting Edge Diameter **DC** (inch)	Insert Corner Radius **RE** (inch)	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
			Maximum Ramping Angle **RMPX**	Minimum Distance **L** ✶1 (inch)	Maximum Hole Diameter **DH max.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)
B	.787	.157	17.5°	1.850	1.240	.394	1.252	.394	.866	.039
		.197	16.6°	2.795	1.161	.236	1.224	.276	.866	.039
	1.000	.157	17.9°	1.81	1.665	.394	1.635	.394	1.269	.236
		.197	14.7°	2.24	1.587	.354	1.596	.354	1.269	.197
	1.250	.157	14.1°	2.323	1.870	.394	1.858	.394	1.417	.236
		.197	13°	2.559	1.791	.354	1.827	.354	1.417	.197
	1.250	.157	12.9°	2.56	2.165	.394	2.130	.394	1.762	.354
		.197	12.2°	2.72	2.087	.354	2.090	.354	1.762	.315
	1.500	.157	10.8°	3.071	2.421	.394	2.402	.394	1.969	.315
		.197	10.2°	3.268	2.343	.354	2.370	.354	1.969	.315
	1.500	.157	10.7°	3.11	2.650	.394	2.622	.394	2.261	.394
		.197	10.1°	3.31	2.571	.354	2.583	.354	2.261	.354
	2.000	.157	6.9°	4.84	3.650	.394	3.621	.394	3.257	.394
		.197	6.5°	5.12	3.571	.354	3.580	.354	3.256	.354
	2.500	.157	5.1°	6.54	4.650	.394	4.600	.394	4.258	.394
		.197	4.8°	6.97	4.571	.354	4.578	.354	4.257	.354
	3.000	.157	4.1°	8.15	5.650	.394	5.619	.394	5.258	.394
		.197	3.8°	8.78	5.571	.354	5.578	.354	5.258	.354
	4.000	.157	2.9°	11.54	7.650	.394	7.618	.394	7.259	.394
		.197	2.7°	12.36	7.571	.354	7.577	.354	7.258	.354
	5.000	.157	2.2°	15.20	9.650	.394	9.618	.394	9.260	.394
		.197	2.1°	15.91	9.571	.354	9.577	.354	9.259	.354

The recommended ramping or helical cutting feed is .002IPT or less.

✶1. Using the maximum ramping angle, the distance to reach the maximum depth of cut is as follows:
L=(maximum depth of cut APMX / tan α). Maximum depth of cut A type is .610", B type is .583".
✶2. The maximum diameter when machining a blind hole with a flat face using a corner radius of .047".
✶3. The maximum diameter when machining a blind hole with a flat face using a corner radius of .094".
✶4. The maximum diameter when machining a blind hole with a flat face using a corner radius of .125".
For other corner radius, use to following formula. {(cutting edge diameter DC) - (corner radius RE) - β} ×2

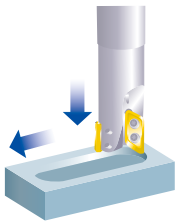
DC	β
1.0–1.25"	.010"
1.5–5.0"	.018"

MAX.DRILLING DEPTH

Holder Type	Insert Corner Radius **RE** (inch)	Max.Drilling Depth (inch)			
		Cutting Edge Diameter **DC** **ϕ.787"**	Cutting Edge Diameter **DC** **ϕ1.000"**	Cutting Edge Diameter **DC** **ϕ1.250"**	Cutting Edge Diameter **DC** **ϕ1.500"–ϕ5.000"**
A	.016–.047	.209	.205	.205	.209
	.063–.094	.189	.181	.185	.189
	.118–.125	.169	.146	.165	.173
B	.157	.146	.106	.142	.150
	.197	.134	.091	.130	.138

The recommended drilling feed is .002 IPT or less.

AXD4000 can be effectively used for pocket machining without the need for a prepared hole.



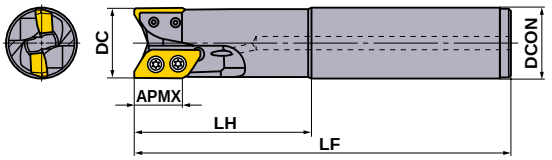
MULTI FUNCTIONAL MILLING
<CUTTING FOR ALUMINUM ALLOY>

Finishing Roughing

AXD7000

P M K **N** S H





SHANK TYPE

Right hand tool holder only.

Type	RE	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	LF	LH	DCON	APMX (inch)	✶2 RMPX	Max. Spindle Speed (min-1)	✶1 Insert Screw	Wrench	Anti-seize Lubricant	Insert
A Holders	.031 – .125	AXD7000UR202SA20SA	●	2	1.250	6.000	2.000	1.250	.827	19°	41000	TS4SB	TKY15D	MK1KS	XDGX2270□□ PDFR-GL
		AXD7000UR242SA24SA	●	2	1.500	7.000	3.000	1.500	.827	13°	36000	TS4SBL	TKY15D	MK1KS	
B Holders	.157 – .197	AXD7000UR202SA20SB	●	2	1.250	6.000	2.000	1.250	.803	18°	41000	TS4SB	TKY15D	MK1KS	XDGX2270□□ PDFR-GL
		AXD7000UR242SA24SB	●	2	1.500	7.000	3.000	1.500	.803	11°	36000	TS4SBL	TKY15D	MK1KS	

(Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operation guidance on page K079.
(Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
(Note 3) Note for insert with a corner radius of .118" and above, as corner radius increases the LF and LH dimension decreases.
✶1 Clamp Torque (lbf-in) : TS4SB=31, TS4SBL=31
✶2 RMPX : Max. Ramping Angle



- Air / coolant through.
- Low resistance inserts.
- Excellent wall accuracy.
- High spindle speeds possible.
- Multi functional milling.

KAPR :0°
GAMP :+11° T :+26°—+27°
GAMF :+26°—+27° I :+11°

Fig.1

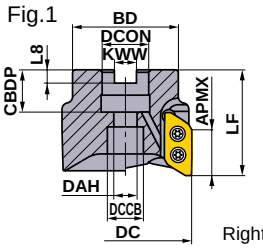
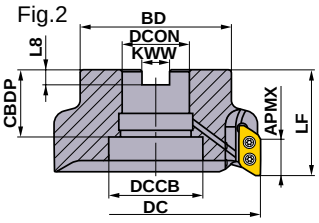
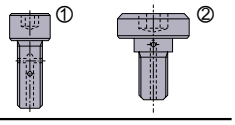


Fig.2



Right hand tool holder only.

DC	Coolant thru Set Bolt	Geometry
ϕ2"	HSCU37513H	①
ϕ3"	HSCU62516H	
ϕ4"	HSCU75016H	
ϕ5"	MBAU75016H	②



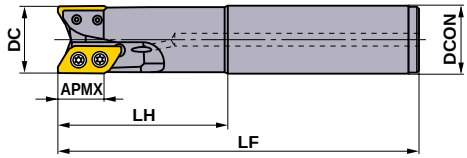
ARBOR TYPE

Type	RE	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	LF	DCON	CBDP	DAH	BD	KWW	L8	DCCB	✶3 WT (lbs)	APMX (inch)	✶2 RMPX	Max. Spindle Speed (min-1)	Type (Fig.)	✶1 Insert Screw	Wrench	Anti-seize Lubricant	Insert
A Holders	.031 – .125	AXD7000UR0203A	●	3	2.000	2.000	.750	.748	.415	1.875	.313	.187	.600	.9	.827	9°	30000	1	TS4SBL	TKY15D	MK1KS	XDGX2270□□ PDFR-GL
		AXD7000UR0303DA	●	3	3.000	2.500	1.250	1.260	.669	2.750	.500	.281	1.024	2.6	.827	5°	23000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000UR0405EA	●	5	4.000	2.500	1.500	1.181	.787	3.810	.625	.375	1.181	5.4	.827	4°	19000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000UR0506EA	●	6	5.000	2.500	1.500	1.575	2.205	3.810	.625	.375	1.181	6.6	.827	3°	16000	2	TS4SBL	TKY15D	MK1KS	
B Holders	.157 – .197	AXD7000UR0203B	●	3	2.000	2.000	.750	.748	.415	1.875	.313	.187	.600	.9	.803	8°	30000	1	TS4SBL	TKY15D	MK1KS	XDGX2270□□ PDFR-GL
		AXD7000UR0303DB	●	3	3.000	2.500	1.250	1.260	.669	2.750	.500	.281	1.024	2.6	.803	4°	23000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000UR0405EB	□	5	4.000	2.500	1.500	1.181	.787	3.810	.625	.375	1.181	5.4	.803	3°	19000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000UR0506EB	□	6	5.000	2.500	1.500	1.575	2.205	3.810	.625	.375	1.181	6.6	.803	2°	20000	2	TS4SBL	TKY15D	MK1KS	

(Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operation guidance on page K079.
(Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
(Note 3) Note for insert with a corner radius of .118" and above, as corner radius increases the LF dimension decreases.
✶1 Clamp Torque (lbf-in) : TS4SBL=31
✶2 RMPX : Max. Ramping Angle
✶3 WT : Mass ✶4 The cutter body includes a set bolt for an arbor.
● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.







METRIC Standard

SHANK TYPE

Right hand tool holder only.

Type	RE	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	LH	DCON	APMX (mm)	RMPX *2	Max. Spindle Speed (min-1)	Insert Screw *1	Wrench	Anti-seize Lubricant	Insert
A Holders	0.8 – 3.2	AXD7000R322SA32SA	★	2	32	170	80	32	21	19°	41000	TS4SB	TKY15D	MK1KS	XDGX2270□□ PDFR-GL
		AXD7000R402SA42SA	★	2	40	170	80	42	21	13°	36000	TS4SBL	TKY15D	MK1KS	
B Holders	4.0 – 5.0	AXD7000R322SA32SB	★	2	32	170	80	32	20.4	18°	41000	TS4SB	TKY15D	MK1KS	
		AXD7000R402SA42SB	★	2	40	170	80	42	20.4	11°	36000	TS4SBL	TKY15D	MK1KS	

(Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operation guidance on page K079.
(Note 2) When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.
(Note 3) Note for inserts with a corner radius of .118" and above, as corner radius increases the OAL and LH dimensions decreases.
*1 Clamp Torque (lbf-in) : TS4SB=31, TS4SBL=31
*2 RMPX : Max. Ramping Angle



Fig.1

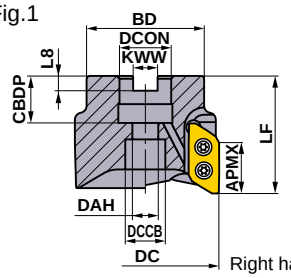
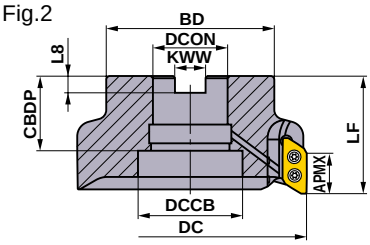
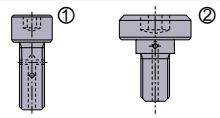


Fig.2



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ80	12035H	①
ϕ100	16040H	
ϕ125	MBA20040H	②



METRIC Standard

For inch arbors

KAPR :0°
GAMP :+11° T :+26°–+29°
GAMF :+26°–+29° I :+11°

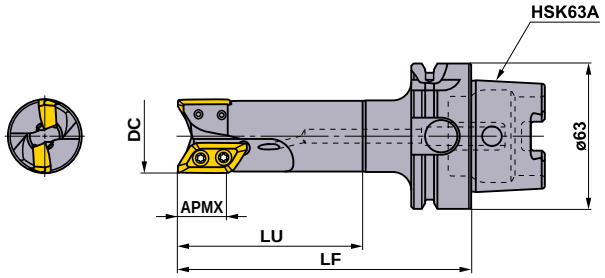
ARBOR TYPE

Type	RE	Order Number	Stock R	Number of Teeth	Dimensions (mm) [inch] DC	LF	DCON	CBDP	DAH	BD	KWW	L8	DCCB	WT *3 (kg)	APMX (mm)	RMPX *2	Max. Spindle Speed (min-1)	Type (Fig.)	Insert Screw *1	Wrench	Anti-seize Lubricant	Insert
A Holders	0.8 – 3.2	AXD7000R08004CA	★	4	80	63	25.4 [1.0"]	26	13	63	9.5	6	20	1.2	21	5°	23000	1	TS4SBL	TKY15D	MK1KS	XDGX2270□□ PDFR-GL
		AXD7000R10005DA	★	5	100	63	31.75 [1.25"]	32	17	70	12.7	8	26	1.8	21	4°	19000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000R12506EA	★	6	125	63	38.1 [1.5"]	40	–	90	15.9	10	56	2.7	21	3°	16000	2	TS4SBL	TKY15D	MK1KS	
B Holders	4.0 – 5.0	AXD7000R08004CB	★	4	80	63	25.4 [1.0"]	26	13	63	9.5	6	20	1.2	20.4	4°	23000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000R10005DB	★	5	100	63	31.75 [1.25"]	32	17	70	12.7	8	26	1.8	20.4	3°	19000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000R12506EB	★	6	125	63	38.1 [1.5"]	40	–	90	15.9	10	56	2.7	20.4	2°	16000	2	TS4SBL	TKY15D	MK1KS	

(Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operation guidance on page K079.
(Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
(Note 3) Note for inserts with a corner radius of .118" and above, as corner radius increases the LF dimension decreases.
*1 Clamp Torque (lbf-in) : TS4SBL=31
*2 RMPX : Max. Ramping Angle
*3 WT : Mass
*4 Set bolt not included.

INSERTS ➤ K077
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001





METRIC Standard

HSK63A SHANK TYPE (A Holders)

Right hand tool holder only.

Type	RE	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	LU	APMX (mm)	✶2 RMPX	Max. Spindle Speed (min-1)	✶1 Insert Screw	Wrench	Anti-seize Lubricant	Insert
A Holders	0.8 I 3.2	AXD7000R03202A-H63A	★	2	32	127	80	21	19°	41000	TS4SB	TKY15D	MK1KS	XDGX2270□□ PDFR-GL
		AXD7000R04002A-H63A	★	2	40	132	85	21	13°	36000	TS4SBL	TKY15D	MK1KS	
		AXD7000R05003A-H63A	★	3	50	137	90	21	9°	30000	TS4SBL	TKY15D	MK1KS	

(Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operation guidance on page K079.
(Note 2) Note for inserts with a corner radius of .118" and above, as corner radius increases the LF and LU dimensions decreases.
(Note 3) There is no data chip hole.
✶1 Clamp Torque (lbf-in) : TS4SB=31, TS4SBL=31
✶2 RMPX : Max. Ramping Angle



Fig.1

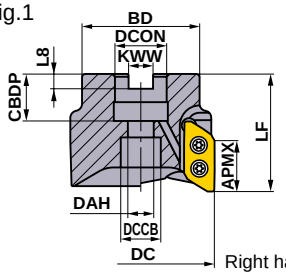
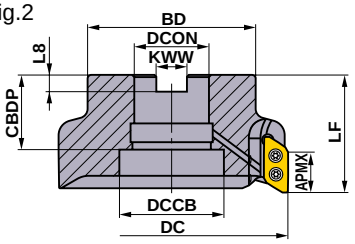
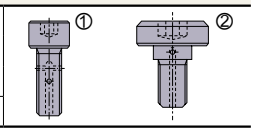


Fig.2



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ50, ϕ63	HSC10030H	①
ϕ80	HSC12035H	
ϕ100	HSC16040H	
ϕ125	MBA20040H	②



METRIC Standard

For metric arbors

KAPR :0°
GAMP :+11° T :+26°—+29°
GAMF :+26°—+29° I :+11°

ARBOR TYPE

Type	RE	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	DCON	CBDP	DAH	BD	KWW	L8	DCCB	✶3 WT (kg)	APMX (mm)	✶2 RMPX	Max. Spindle Speed (min-1)	Type (Fig.)	✶1 Insert Screw	Wrench	Anti-seize Lubricant	Insert
A Holders	0.8 I 3.2	AXD7000-050A03RA	★	3	50	50	22	20	11	45	10.4	6.3	17	0.4	21	9°	30000	1	TS4SBL	TKY15D	MK1KS	XDGX2270□□ PDFR-GL
		AXD7000-063A03RA	★	3	63	50	22	20	11	45	10.4	6.3	17	0.5	21	7°	25000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-080A04RA	★	4	80	63	27	23	13	63	12.4	7	20	1.2	21	5°	23000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-100A05RA	★	5	100	63	32	26	17	70	14.4	8	26	1.8	21	4°	19000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-125B06RA	★	6	125	63	40	40	—	90	16.4	9	56	2.7	21	3°	16000	2	TS4SBL	TKY15D	MK1KS	
B Holders	4.0 I 5.0	AXD7000-050A03RB	★	3	50	50	22	20	11	45	10.4	6.3	17	0.4	20.4	8°	30000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-063A03RB	★	3	63	50	22	20	11	45	10.4	6.3	17	0.5	20.4	6°	25000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-080A04RB	★	4	80	63	27	23	13	63	12.4	7	20	1.2	20.4	4°	23000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-100A05RB	★	5	100	63	32	26	17	70	14.4	8	26	1.8	20.4	3°	19000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-125B06RB	★	6	125	63	40	40	—	90	16.4	9	56	2.7	20.4	2°	16000	2	TS4SBL	TKY15D	MK1KS	

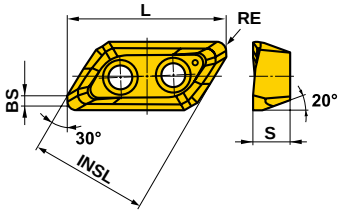
(Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operation guidance on page K079.
(Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
(Note 3) Note for inserts with a corner radius of .118" and above, as corner radius increases the LF dimension decreases.
✶1 Clamp Torque (lbf-in) : TS4SBL=31
✶2 RMPX : Max. Ramping Angle ✶3 WT : Mass
✶4 Set bolt not included.

● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only. <10 inserts in one case>

INSERTS

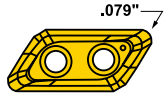
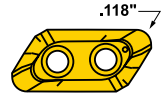
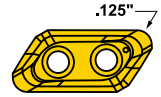
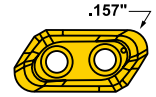
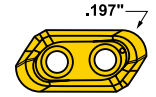
Work Material	N	Non-Ferrous Metal

Cutting Conditions : ● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting
Honing : F : Sharp

Shape	Order Number	Class	Honing	Stock: Coated LC15TF	Stock: Carbide TF15	Dimensions (inch) L	INSL	S	BS	RE	Geometry
	**XDGX227008PDFR-GL**	G	F	★	●	1.181	.886	.276	.079	.031	
	XDGX227016PDFR-GL	G	F	★	●	1.181	.886	.276	.047	.063	
	XDGX227020PDFR-GL	G	F	★	●	1.181	.886	.276	.031	.079	
	XDGX227024PDFR-GL	G	F	□	●	1.181	.886	.276	.016	.094	
	XDGX227030PDFR-GL	G	F	★	●	1.134	.886	.276	.031	.118	
	XDGX227032PDFR-GL	G	F	★	●	1.134	.886	.276	.024	.125	
	XDGX227040PDFR-GL	G	F	★	●	1.083	.886	.276	.035	.157	
	XDGX227050PDFR-GL	G	F	★	●	1.063	.886	.276	.016	.197	

COMBINATION OF HOLDER AND INSERT CORNER RADIUS

Holder	**A** Holder	**B** Holder
	(Inch) **AXD7000UR○○○○○○○A** **AXD7000UR○○○○○A** **AXD7000UR○○○○A** (Metric) **AXD7000R○○○○○○○A** **AXD7000R○○○○○A** **AXD7000R-○○○○○A** **AXD7000R○○○○○-H63A**	(Inch) **AXD7000UR○○○○○○○B** **AXD7000UR○○○○○B** **AXD7000UR○○○○B** (Metric) **AXD7000R○○○○○○○B** **AXD7000R○○○○○B** **AXD7000R-○○○○○B**

Insert Corner Radius (RE)	.031"	.063"	.079"	.118"	.125"	.157"	.197"
							
	XDGX 227008PDFR-GL	**XDGX 227016PDFR-GL**	**XDGX 227020PDFR-GL**	**XDGX 227030PDFR-GL**	**XDGX 227032PDFR-GL**	**XDGX 227040PDFR-GL**	**XDGX 227050PDFR-GL**

(Note) Other combinations of holder and insert corner R are not acceptable.

RECOMMENDED CUTTING CONDITIONS

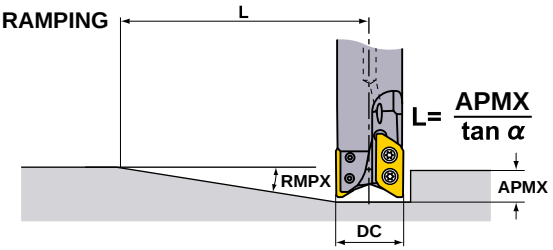
Work Material		Insert Grade	Width of Cut **ae** (inch)	Cutting Speed **vc** (SFM)	Depth of Cut **ap** (inch)	Feed per Tooth (inch/tooth) Cutting Edge Diameter **DC** ϕ1.250"	ϕ1.500"	ϕ2.000"–ϕ3.000"
N	Aluminum Alloy	**LC15TF TF15**	−0.25DC	3300 (660–9800)	−.197	≤ .014	≤ .016	≤ .016
					.197 – .394	≤ .012	≤ .014	≤ .014
					.394 – .591	≤ .010	≤ .012	≤ .012
					.591 – .787	≤ .008	≤ .010	≤ .010
			−0.5DC	3300 (660–9800)	−.197	≤ .014	≤ .014	≤ .016
					.197 – .394	≤ .012	≤ .012	≤ .014
					.394 – .591	≤ .010	≤ .010	≤ .012
					.591 – .787	≤ .008	≤ .008	≤ .010
			−0.75DC	3300 (660–9800)	−.197	≤ .012	≤ .012	≤ .014
					.197 – .394	≤ .010	≤ .010	≤ .012
					.394 – .591	≤ .008	≤ .008	≤ .010
					.591 – .787	≤ .006	≤ .006	≤ .008
			DC	3300 (660–9800)	−.197	≤ .010	≤ .012	≤ .014
					.197 – .394	≤ .008	≤ .010	≤ .012
					.394 – .591	≤ .006	≤ .008	≤ .010
					.591 – .787	≤ .004	≤ .006	≤ .008

(Note 1) The above cutting conditions are determined based on high rigidity of workpiece and machine, where no vibration occurred. If vibrations occur make adjustments according to the machining conditions.
(Note 2) Vibrations may occur in the following conditions.
- When using long tool overhang.
- When pocket machining corner radii.
- When the workpiece has poor clamping rigidity or when the machine rigidity or workpiece rigidity is low, vibrations can occur easily, if so, reduce cutting conditions such as width and depth of cut and feed per tooth.

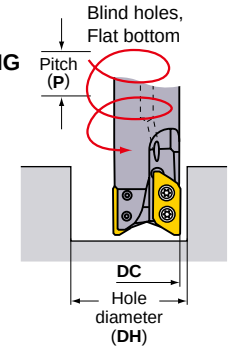
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TECHNICAL DATA ➤ N001

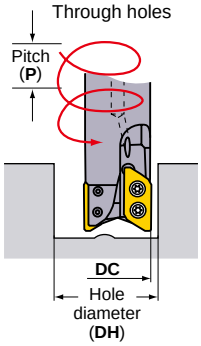
RAMPING/HELICAL CUTTING

RAMPING



HELICAL CUTTING





RAMPING/HELICAL CUTTING

Holder Type	Cutting Edge Diameter **DC** (inch)	Insert Corner Radius **RE** (inch)	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
			Maximum Ramping Angle **RMPX**	Minimum Distance **L** *1 (inch)	Maximum Hole Diameter **DH max.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)
A	1.250	.031	20°	2.272	2.417	.787	2.276	.787	1.535	.315
		.063	20°	2.272	2.354	.748	2.276	.748	1.535	.315
		.079	20°	2.272	2.323	.709	2.276	.748	1.535	.315
		.094	20°	2.272	2.291	.709	2.276	.748	1.535	.315
		.118	19.3°	2.362	2.244	.669	2.193	.669	1.535	.315
		.126	19.3°	2.362	2.228	.669	2.193	.669	1.535	.315
	1.500	.031	14.1°	3.292	2.902	.787	2.776	.787	2.047	.394
		.063	14.1°	3.292	2.839	.748	2.776	.748	2.047	.394
		.079	14.1°	3.292	2.807	.709	2.776	.748	2.047	.394
		.094	14.1°	3.292	2.776	.709	2.776	.748	2.047	.394
		.118	13.3°	3.498	2.728	.669	2.693	.669	2.047	.394
		.126	13.3°	3.498	2.713	.669	2.693	.669	2.047	.394
	2.000	.031	9.8°	4.778	3.902	.787	3.768	.787	3.031	.551
		.063	9.8°	4.778	3.839	.748	3.768	.748	3.031	.551
		.079	9.8°	4.778	3.807	.709	3.768	.748	3.031	.551
		.094	9.8°	4.778	3.776	.709	3.768	.748	3.031	.551
		.118	9.1°	5.163	3.728	.669	3.768	.669	3.031	.472
		.126	9.1°	5.163	3.713	.669	3.687	.669	3.031	.472
	3.000	.031	5.3°	8.915	5.902	.787	5.768	.787	5.000	.551
		.063	5.3°	8.915	5.839	.748	5.768	.748	5.000	.551
		.079	5.3°	8.915	5.807	.709	5.768	.748	5.000	.551
		.094	5.3°	8.915	5.776	.709	5.768	.748	5.000	.551
		.118	4.9°	9.647	5.728	.669	5.686	.669	5.000	.512
		.126	4.9°	9.647	5.713	.669	5.686	.669	5.000	.512
	4.000	.031	4.2°	11.262	7.902	.787	7.768	.787	6.969	.669
		.063	4.2°	11.262	7.839	.748	7.768	.748	6.969	.669
		.079	4.2°	11.262	7.807	.709	7.768	.748	6.969	.669
		.094	4.2°	11.262	7.776	.709	7.768	.748	6.969	.669
		.118	3.8°	12.451	7.728	.669	7.686	.669	6.969	.591
		.126	3.8°	12.451	7.713	.669	7.686	.669	6.969	.591
	5.000	.031	2.5°	18.941	9.902	.669	9.767	.630	9.016	.512
		.063	2.5°	18.941	9.839	.630	9.767	.630	9.016	.512
		.079	2.5°	18.941	9.807	.630	9.767	.630	9.016	.512
		.094	2.5°	18.941	9.776	.630	9.767	.630	9.016	.512
		.118	2.2°	21.527	9.728	.551	9.685	.551	9.016	.472
		.126	2.2°	21.527	9.713	.551	9.685	.551	9.016	.472

Holder Type	Cutting Edge Diameter **DC** (inch)	Insert Corner Radius **RE** (inch)	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
			Maximum Ramping Angle **RMPX**	Minimum Distance **L** ✱1 (inch)	Maximum Hole Diameter **DH max.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)
B	1.250	.157	18°	2.471	2.165	.630	2.106	.630	1.535	.276
		.197	18°	2.471	2.087	.591	2.070	.591	1.535	.276
	1.500	.157	11°	4.131	2.650	.630	2.605	.630	2.047	.315
		.197	11°	4.131	2.571	.591	2.569	.591	2.047	.315
	2.000	.157	8°	5.714	3.650	.630	3.599	.630	3.031	.433
		.197	8°	5.714	3.571	.591	3.563	.591	3.031	.433
	3.000	.157	4°	11.820	5.650	.551	5.597	.551	5.000	.433
		.197	4°	11.820	5.571	.551	5.561	.551	5.000	.433
	4.000	.157	3°	15.322	7.650	.591	7.597	.591	6.969	.472
		.197	3°	15.322	7.571	.551	7.561	.551	6.969	.472
	5.000	.157	2°	22.995	9.650	.472	9.597	.472	9.016	.433
		.197	2°	22.995	9.571	.472	9.559	.472	9.016	.433

(Note) The recommended ramping and helical cutting feed is .002IPT or less.

✱1. Using the maximum ramping angle, the distance to reach the maximum depth of cut is as follows:
L=(maximum depth of cut APMX / tan α). Maximum depth of cut A type is .827", B type is .803".
✱2. The maximum diameter when machining a blind hole with a flat face using a corner radius of .063".
✱3. The maximum diameter when machining a blind hole with a flat face using a corner radius of .118".
For other corner radius, use to following formula. {(cutting edge diameter DC) - (corner radius RE) - β} ×2

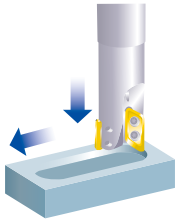
DC	β
1.25–1.5"	.010"
2.0–5.0"	.018"

MAX.DRILLING DEPTH

Holder Type	**RE** (inch)	Max.Drilling Depth (inch)		
		Cutting Edge Diameter **DC** **ϕ1.250"**	Cutting Edge Diameter **DC** **ϕ1.500"**	Cutting Edge Diameter **DC** **ϕ2.00"–ϕ5.000"**
A	.031	.209	.205	.205
	.063–.094	.209	.205	.205
	.118–.125	.181	.181	.181
B	.157	.157	.154	.154
	.197	.146	.142	.142

The recommended drilling feed is .002 IPT or less.

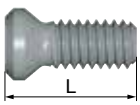
AXD7000 can be effectively used for pocket machining without the need for a prepared hole.



OPERATIONAL GUIDANCE

Only use the inserts and parts provided by Mitsubishi Materials with this tool. Use of the correct insert clamp screws is especially important to ensure overall tool safety.
Do not use damaged or worn clamp screws.

Cutting Edge Diameter **DC**(inch)	ø1.250"	ø1.500"–ø5.000"
Clamp Screw Number	TS4SB	TS4SBL
Overall Length **L**(inch)	.353	.413
Clamp Torque (lbf-in)	31	31



●When tightening the clamp screws, follow the order in Figure 1.
●The maximum allowable spindle speeds are shown in Table 1. Ensure that the cutter operates under the maximum allowable spindle speed.
The maximum allowable spindle speeds for safety purposes are determined in accordance with ISO15641 (Milling Cutters for high speed machining–Safety requirements).

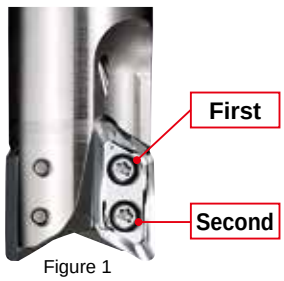


Figure 1

(Table 1) Maximum allowable spindle speed

Cutting Edge Diameter **DC**(inch)	ø1.250"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"
Max. Allowable Spindle Speed (min^{-1})	41000	36000	30000	25000	23000	19000	16000

●Even when operating under the maximum allowable spindle speed, if the spindle speed is equal to or higher than the values shown in table 2, it is recommended that the balance quality (with the arbor or milling chuck) conforms to G6.3 or better based on ISO1940. It is also recommended to replace the clamp screws with new ones when changing inserts. Furthermore, ensure to use machines that are provided with safety measures in case of cutter breakage.
✱ The balance quality of the holder (without inserts and clamp screws) is G6.3 or better at 10000min^{-1}.

(Table 2) Maximum spindle speed when balancing with the arbor or milling chuck has not been achieved

Cutting Edge Diameter **DC**(inch)	ø1.250"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"
Max. Spindle Speed (min^{-1})	9500	7600	6000	4800	3800	3000	2400

●When setting the spindle speed, take into consideration the maximum allowable spindle speed of the arbor or milling chuck.
●Use the specified set bolt when using the arbor type with through coolant.
●The inserts have sharp cutting edges and handling them with bare hands may cause injuries. Always wear safety gloves when handling the indexable inserts.

MULTI FUNCTIONAL MILLING

<ALUMINUM ALLOY FOR DIFFICULT-TO-CUT MATERIAL CUTTING>

Finishing Roughing

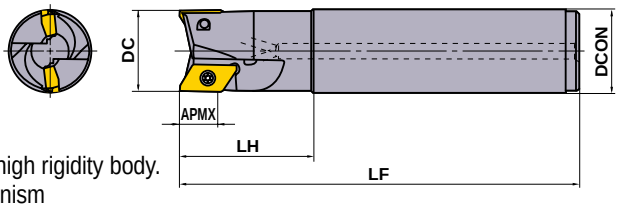
Including Flat faces

BXD4000

P M K N S H



- Air / coolant through.
- Low resistance inserts & high rigidity body.
- The Anti Fly Insert mechanism guarantees secure high-revolution milling.



STRAIGHT SHANK TYPE

Right hand tool holder only.

Type	RE	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	LF	DCON	LH	APMX (inch)	RMPX ✶3	Max. Spindle Speed (min^{-1}) Balance Unknown	G40 ✶1 Balanced	✶2 Insert Screw	Wrench
A Holders	.016 – .125	BXD4000R162SA12S	●	2	1.000	6.000	.750	2.000	.591	20°	12000	38000	TS4SL	TKY15W
		BXD4000R162SA16S	●	2	1.000	6.000	1.000	2.000	.591	20°	12000	38000	TS4SL	TKY15W
		BXD4000R202SA20S	●	2	1.250	6.000	1.250	2.000	.591	13°	9500	33000	TS4SL	TKY15W
		BXD4000R243SA20S	●	3	1.500	6.000	1.250	2.000	.591	10°	7600	29000	TS4SL	TKY15W
B Holders	.157 – .197	BXD4000R162SA12SB	●	2	1.000	6.000	.750	2.000	.591	20°	12000	38000	TS4SL	TKY15W
		BXD4000R162SA16SB	●	2	1.000	6.000	1.000	2.000	.591	20°	12000	38000	TS4SL	TKY15W
		BXD4000R202SA20SB	●	2	1.250	6.000	1.250	2.000	.591	13°	9500	33000	TS4SL	TKY15W
		BXD4000R243SA20SB	●	3	1.500	6.000	1.250	2.000	.591	10°	7600	29000	TS4SL	TKY15W

✶1 You need to balance the tool and holder together so that it confirms to G40 or higher standards.
✶2 Clamp Torque (lbf-in) : TS4SL=35
✶3 RMPX : Max. Ramping Angle

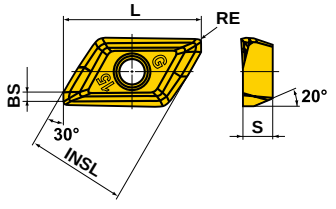
INSERTS WITH BREAKER

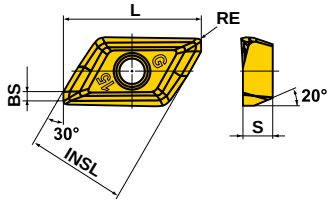
Work Material			Coated VP15TF	Coated LC15TF	Carbide TF15
	P	Steel	●		
	M	Stainless Steel	●		
	K	Cast Iron	●	★	★
	N	Non-Ferrous Metal		★	★
	S	Heat-resistant Alloy, Titanium Alloy	●		

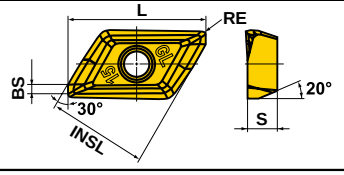
Cutting Conditions :
● : Stable Cutting ● : General Cutting ★ : Unstable Cutting

Honing :
E : Round **F** : Sharp

Shape	Order Number	Class	Honing	VP15TF	LC15TF	TF15	L	INSL	S	BS	RE	Geometry
G breaker	XDGT1550PDFR-G04	G	F		★	●	.866	.630	.197	.059	.016	
	XDGT1550PDFR-G08	G	F		★	●	.866	.630	.197	.043	.031	
	XDGT1550PDFR-G12	G	F		★	★	.866	.630	.197	.028	.047	
	XDGT1550PDFR-G16	G	F		★	●	.866	.630	.197	.016	.063	
	XDGT1550PDFR-G20	G	F		★	●	.854	.630	.197	.008	.079	
	XDGT1550PDFR-G30	G	F		★	●	.787	.630	.197	.024	.118	
	XDGT1550PDFR-G32	G	F		★	●	.787	.630	.197	.016	.125	
	XDGT1550PDFR-G40	G	F		★	●	.748	.630	.197	.020	.157	
	XDGT1550PDFR-G50	G	F		★	●	.709	.630	.197	.016	.197	
	XDGT1550PDER-G04	G	E	●			.866	.630	.197	.059	.016	
	XDGT1550PDER-G08	G	E	●			.866	.630	.197	.043	.031	
	XDGT1550PDER-G12	G	E	★			.866	.630	.197	.028	.047	
	XDGT1550PDER-G16	G	E	●			.866	.630	.197	.016	.063	
	XDGT1550PDER-G20	G	E	●			.854	.630	.197	.008	.079	
	XDGT1550PDER-G30	G	E	●			.787	.630	.197	.024	.118	
	XDGT1550PDER-G32	G	E	●			.787	.630	.197	.016	.125	
	XDGT1550PDER-G40	G	E	●			.748	.630	.197	.020	.157	
	XDGT1550PDER-G50	G	E	●			.709	.630	.197	.016	.197	
Lower Cutting Resistance Type	XDGT1550PDFR-GL04	G	F			●	.866	.630	.197	.059	.016	
	XDGT1550PDFR-GL08	G	F			●	.866	.630	.197	.043	.031	

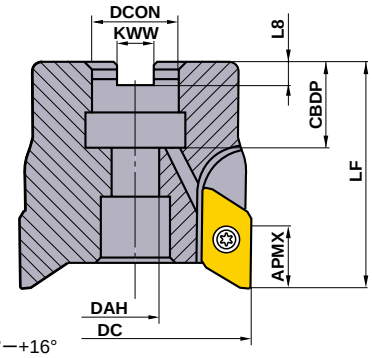






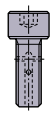
● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>





KAPR :0°
GAMP :+15°
GAMF :+13°—+16°
T :+13°—+16°
I :+15°

DC	Coolant thru Set Bolt
1.5	HSCU25014H
2	HSCU37513H
2.5	HSCU37513H
3	HSCU50014H
4	HSCU75016H



Right hand tool holder only.

ARBOR TYPE

Type	RE	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	LF	DCON	CBDP	DAH	KWW	L8	APMX (inch)	✶3 RMPX	Max. Spindle Speed (min^{-1}) Balance Unknown	G40 ✶1 Balanced	✶2 Insert Screw	Wrench
A Holders	.016 — .125	**BXD4000R1503**	●	3	1.500	1.969	.500	.630	.276	.250	.156	.591	10°	7600	29000	TS4SL	TKY15W
		BXD4000R**0203**	●	3	2.000	1.969	.750	.748	.415	.313	.187	.591	7°	6000	24000	TS4SL	TKY15W
		BXD4000R**0204**	●	4	2.000	1.969	.750	.748	.415	.313	.187	.591	7°	6000	24000	TS4SL	TKY15W
		BXD4000R**2504**	●	4	2.500	1.969	.750	.748	.415	.313	.187	.591	5°	4800	21000	TS4SL	TKY15W
		BXD4000R**0305**	●	5	3.000	1.969	1.000	1.024	.539	.375	.219	.591	3°	3800	19000	TS4SL	TKY15W
		BXD4000R**0406**	●	6	4.000	2.480	1.500	1.181	.787	.625	.375	.591	3°	3000	16000	TS4SL	TKY15W
B Holders	.157 — .197	**BXD4000R1503B**	●	3	1.500	1.969	.500	.630	.276	.250	.156	.591	10°	7600	29000	TS4SL	TKY15W
		BXD4000R**0203B**	●	3	2.000	1.969	.750	.748	.415	.313	.187	.591	7°	6000	24000	TS4SL	TKY15W
		BXD4000R**0204B**	●	4	2.000	1.969	.750	.748	.415	.313	.187	.591	7°	6000	24000	TS4SL	TKY15W
		BXD4000R**2504B**	●	4	2.500	1.969	.750	.748	.415	.313	.187	.591	5°	4800	21000	TS4SL	TKY15W
		BXD4000R**0305B**	●	5	3.000	1.969	1.000	1.024	.539	.375	.219	.591	3°	3800	19000	TS4SL	TKY15W
		BXD4000R**0406B**	●	6	4.000	2.480	1.500	1.181	.787	.625	.375	.591	3°	3000	16000	TS4SL	TKY15W

✶1 You need to balance the tool and holder together so that it confirms to G40 or higher standards.
✶2 Clamp Torque (lbf-in) : TS4SL=35 ✶3 RMPX : Max. Ramping Angle ✶4 The cutter body includes a set bolt for an arbor.

COMBINATION OF HOLDER AND INSERT CORNER RADIUS

Holder	～A Holder							～B Holder	
	BXD4000R○○○○○○○A							BXD4000R○○○○○○○B	
Insert Corner Radius (RE)	.016"	.031"	.047"	.063"	.079"	.118"	.125"	.157"	.197"
	XDGT.....-G04	XDGT.....-G08	XDGT.....-G12	XDGT.....-G16	XDGT.....-G20	XDGT.....-G30	XDGT.....-G32	XDGT.....-G40	XDGT.....-G50

(Note) Other combinations of holder and insert corner R are not acceptable.

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed per Tooth (inch/tooth)
P	Mild Steel	≤180HB	**VP15TF**	590 (490—655)	.006 (.004—.008)
P	Carbon Steel Alloy Steel	≤280HB	**VP15TF**	490 (390—655)	.006 (.004—.008)
P		280—350HB	**VP15TF**	460 (390—525)	.006 (.004—.008)
M	Stainless Steel	≤270HB	**VP15TF**	460 (390—525)	.008 (.004—.012)
N	Aluminum Alloy	—	**TF15**	3280 (655—9840)	.012 (.004—.020)
S	Titanium Alloy	—	**VP15TF**	130 (100—195)	.004 (.004—.012)
S	Heat Resistant Alloy	—	**VP15TF**	100 (65—130)	.006 (.004—.008)

The figure above are the guidelines for conditions of general cutting by a standard type tool.
The conditions vary depending on machine strength, the length of overhang, and work clamping conditions.
Please adjust table feed when using long shank type tool.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig.1
ø40

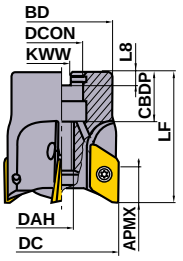


Fig.2
ø50
ø63
ø80
ø100

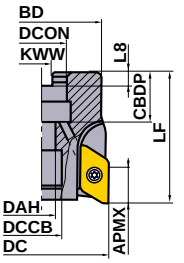
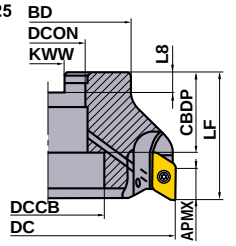
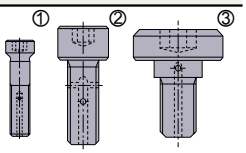


Fig.3
ø125



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ40	HFF08043H	①
ϕ50, ϕ63	HSC10030H	②
ϕ80	HSC12035H	
ϕ100	HSC16040H	
ϕ125	MBA20040H	③



METRIC Standard

For metric arbors

KAPR :0°
GAMP :+14°—+15° T :+8°—+16°
GAMF :+13°—+16° I :+11°—+15°

ARBOR TYPE

Type	RE	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	DCON	CBDP	DAH	BD	KWW	L8	DCCB	★3 WT (kg)	APMX (mm)	★2 RMPX	Max. Spindle Speed (min⁻¹)	Type (Fig.)	★1 Insert Screw	Wrench	Insert
A Holders	0.4 – 3.2	BXD4000-040A03RA	★	3	40	50	16	18	8.5	32	8.4	5.6	—	0.3	15	9°	29000	1	TS4SL	TKY15W	XDGT1550 PD□R-G□□
		BXD4000-050A04RA	★	4	50	50	22	20	11	41	10.4	6.3	17	0.4	15	6°	24000	2	TS4SL	TKY15W	
		BXD4000-063A05RA	★	5	63	50	22	20	11	50	10.4	6.3	17	0.7	15	5°	21000	2	TS4SL	TKY15W	
		BXD4000-080A05RA	★	5	80	50	27	23	13	60	12.4	7	20	1.1	15	3°	19000	2	TS4SL	TKY15W	XDGT1550 PD□R-GL□□
		BXD4000-100A06RA	★	6	100	63	32	26	17	70	14.4	8	26	2.0	15	3°	16000	2	TS4SL	TKY15W	
		BXD4000-125B07RA	★	7	125	63	40	40	—	80	16.4	9	56	2.8	15	2°	14000	3	TS4SL	TKY15W	
B Holders	4.0 – 5.0	BXD4000-040A03RB	★	3	40	50	16	18	8.5	32	8.4	5.6	—	0.3	15	9°	29000	1	TS4SL	TKY15W	
		BXD4000-050A04RB	★	4	50	50	22	20	11	41	10.4	6.3	17	0.4	15	6°	24000	2	TS4SL	TKY15W	
		BXD4000-063A05RB	★	5	63	50	22	20	11	50	10.4	6.3	17	0.7	15	5°	21000	2	TS4SL	TKY15W	XDGT1550 PD□R-G□□
		BXD4000-080A05RB	★	5	80	50	27	23	13	60	12.4	7	20	1.1	15	3°	19000	2	TS4SL	TKY15W	
		BXD4000-100A06RB	★	6	100	63	32	26	17	70	14.4	8	26	2.0	15	3°	16000	2	TS4SL	TKY15W	
		BXD4000-125B07RB	★	7	125	63	40	40	—	80	16.4	9	56	2.8	15	2°	14000	3	TS4SL	TKY15W	

★1 Clamp Torque (lbf-in) : TS4SL=35
★2 RMPX : Max. Ramping Angle
★3 WT : Mass

METRIC Standard

For inch arbors

ARBOR TYPE

Type	RE	Order Number	Stock R	Number of Teeth	Dimensions (mm) [inch] DC	LF	CBDP	L8	DAH	KWW	DMM	DCCB	BD	★3 WT (kg)	APMX (mm)	★2 RMPX	Max. Spindle Speed (min⁻¹)	Type (Fig.)	★1 Insert Screw	Wrench	Insert
A Holders	0.4 – 3.2	BXD4000R08005CA	★	5	80	50	26	6	13	9.5	25.4 [1.0"]	20	60	1.1	15	3°	19000	2	TS4SL	TKY15W	XDGT1550 PD□R-G□□
		BXD4000R10006DA	★	6	100	63	32	8	17	12.7	31.75 [1.25"]	26	70	2.0	15	3°	16000	2	TS4SL	TKY15W	
		BXD4000R12507EA	★	7	125	63	40	10	—	15.9	38.1 [1.5"]	56	80	2.8	15	2°	14000	3	TS4SL	TKY15W	XDGT1550 PD□R-GL□□
B Holders	4.0 – 5.0	BXD4000R08005CB	★	5	80	50	26	6	13	9.5	25.4 [1.0"]	20	60	1.1	15	3°	19000	2	TS4SL	TKY15W	
		BXD4000R10006DB	★	6	100	63	32	8	17	12.7	31.75 [1.25"]	26	70	2.0	15	3°	16000	2	TS4SL	TKY15W	XDGT1550 PD□R-G□□
		BXD4000R12507EB	★	7	125	50	40	10	—	15.9	38.1 [1.5"]	56	80	2.8	15	2°	14000	3	TS4SL	TKY15W	

(Note 1) The maximum spindle speeds stated above are based on ISO15641.
(Note 2) When using the tool at high spindle speeds, please pay special attention to the balancing. The whole tool assembly should be balanced according to G6.3 based on ISO1940 quality grades.
★1 Clamp Torque (lbf-in) : TS4SL=35
★2 RMPX : Max. Ramping Angle ★3 WT : Mass
★4 Set bolt not included.

★ : Inventory maintained in Japan.



Fig.1 Straight Shank

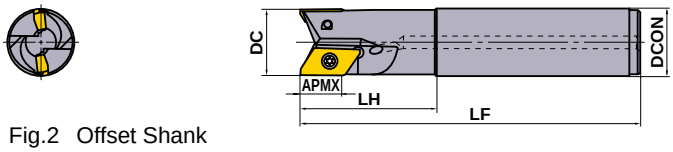
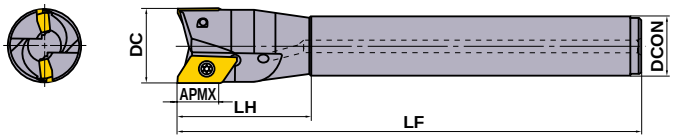


Fig.2 Offset Shank



METRIC Standard

SHANK TYPE

Right hand tool holder only.

Type	RE	Shank Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	APMX	LF	LH	DCON	★3 RMPX	Max. Spindle Speed (min-1)	Type (Fig.)	★2 Insert Screw	Wrench	Insert
A Holders	0.4 — 3.2	Standard	BXD4000R201SA20SA	★	1	20	15	110	35	20	28°	15000	1	TS4SL	TKY15W	XDGT1550 PD○R-G○○
			BXD4000R252SA25SA	★	2	25	15	125	50	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R282SA25SA	★	2	28	15	125	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R322SA32SA	★	2	32	15	150	50	32	13°	33000	1	TS4SL	TKY15W	
			BXD4000R352SA32SA	★	2	35	15	150	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32SA	★	3	40	15	170	80	32	9°	29000	2	TS4SL	TKY15W	
			BXD4000R403SA42SA	★	3	40	15	170	80	42	9°	29000	1	TS4SL	TKY15W	XDGT1550 PD○R-GL○○
		Long	BXD4000R252SA25LA	★	2	25	15	170	80	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R322SA32LA	★	2	32	15	200	80	32	13°	33000	1	TS4SL	TKY15W	
		Extra Long	BXD4000R282SA25ELA	★	2	28	15	220	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R352SA32ELA	★	2	35	15	250	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32ELA	★	3	40	15	250	65	32	9°	29000	2	TS4SL	TKY15W	
B Holders	4.0 — 5.0	Standard	BXD4000R201SA20SB	★	1	20	15	110	35	20	28°	15000	1	TS4SL	TKY15W	XDGT1550 PD○R-G○○
			BXD4000R252SA25SB	★	2	25	15	125	50	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R282SA25SB	★	2	28	15	125	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R322SA32SB	★	2	32	15	150	50	32	13°	33000	1	TS4SL	TKY15W	
			BXD4000R352SA32SB	★	2	35	15	150	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32SB	★	3	40	15	170	80	32	9°	29000	2	TS4SL	TKY15W	
			BXD4000R403SA42SB	★	3	40	15	170	80	42	9°	29000	1	TS4SL	TKY15W	
		Long	BXD4000R252SA25LB	★	2	25	15	170	80	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R322SA32LB	★	2	32	15	200	80	32	13°	33000	1	TS4SL	TKY15W	
		Extra Long	BXD4000R282SA25ELB	★	2	28	15	220	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R352SA32ELB	★	2	35	15	250	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32ELB	★	3	40	15	250	65	32	9°	29000	2	TS4SL	TKY15W	

★1 You need to balance the tool and holder together so that it confirms to G40 or higher standards.
★2 Clamp Torque (lbf-in) : TS4SL=35
★3 RMPX : Max. Ramping Angle

OPERATIONAL GUIDANCE

Only use the inserts and parts provided by Mitsubishi Materials with this tool. Use of the correct insert clamp screws is especially important to ensure overall tool safety. Do not use damaged or worn clamp screws.

- When tightening the clamp screws, follow the order in Figure 1.
- The maximum allowable spindle speeds are shown in Table 1. Ensure that the cutter operates under the maximum allowable spindle speed.
  The maximum allowable spindle speeds for safety purposes are determined in accordance with ISO15641 (Milling Cutters for high speed machining–Safety requirements).

(Table 1) Maximum allowable spindle speed

Cutting Edge Diameter **DC**(inch)	ø.750"	ø.950"	ø1.100"	ø1.250"	ø1.350"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"
Max. Allowable Spindle Speed (min-1)	15000※	38000	35000	33000	31000	29000	24000	21000	19000	16000	14000

※Φ20mm with one tooth balancing is necessary to adjust sensitively.

- Even when operating under the maximum allowable spindle speed, if the spindle speed is equal to or higher than the values shown in table 2, it is recommended that the balance quality (with the arbor or milling chuck) conforms to G40 or better based on ISO1940. It is also recommended to replace the clamp screws with new ones when changing inserts. Furthermore, ensure to use machines that are provided with safety measures in case of cutter breakage.

★ The balance quality of the holder (without inserts and clamp screws) is G40 or better at 10000min-1.

(Table 2) Maximum spindle speed when balancing with the arbor or milling chuck has not been achieved

Cutting Edge Diameter **DC**(inch)	ø.750"	ø.950"	ø1.100"	ø1.250"	ø1.350"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"
Max. Spindle Speed (min-1)	15000	12000	10800	9500	8700	7600	6000	4800	3800	3000	2400

- When setting the spindle speed, take into consideration the maximum allowable spindle speed of the arbor or milling chuck.
- Use the specified set bolt when using the arbor type with through coolant.
- The inserts have sharp cutting edges and handling them with bare hands may cause injuries. Always wear safety gloves when handling the indexable inserts.

INSERTS ➤ K080
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001
MILLING

DEEP SHOULDER MILLING

Roughing

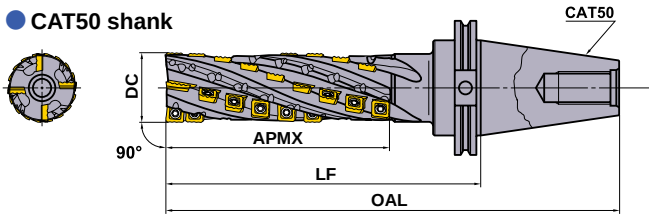
SPX

P M K N S H

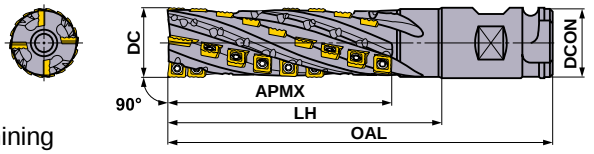


- The wavy cutting edge helps to reduce cutting resistance.
- Suitable for heavy machining due to holder rigidity.

CAT50 shank



Straight shank (Combination type)

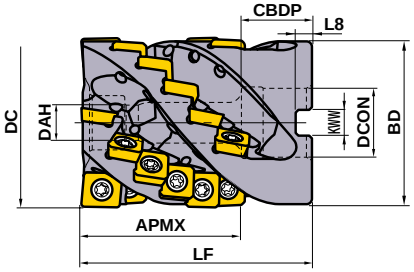


SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock	Number of Flute	Number of Teeth	Dimensions (inch)						Number of Insert		
											Bottom Cutting Edge A	Bottom Cutting Edge B	Peripheral Cutting Edge
				Total	DC	OAL	DCON	LH	LF	APMX	JPMX 190412-○○	MPMX 120412-○○	SPMX 120408-○○
CAT50 Shank	SPX4R3224CAT50NS	●	2	24	2.000	11.000	–	–	7.000	4.300	2	2	20
	SPX4R3234CAT50NM	●	2	34	2.000	13.000	–	–	9.000	6.200	2	2	30
	SPX4R3244CAT50NL	●	2	44	2.000	15.000	–	–	11.000	8.100	2	2	40
Straight Shank (Combination)	SPX4R05016WNES	●	2	16	1.969	7.091	2.000	3.937	–	2.835	2	2	12
	SPX4R05024WNS	●	2	24	1.969	8.661	2.000	5.512	–	4.331	2	2	20
	SPX4R05034WNM	●	2	34	1.969	10.630	2.000	7.480	–	6.181	2	2	30
	SPX4R05044WNL	●	2	44	1.969	12.598	2.000	9.449	–	8.071	2	2	40





Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ2.500"	HSCUF50028	
ϕ3.000"	HSCUF62528	

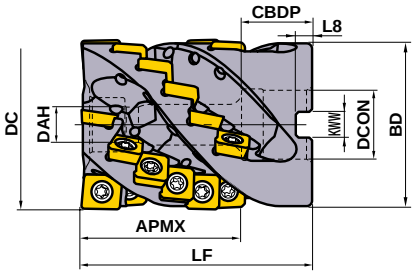
SHELL TYPE

Order Number	Stock	Number of Teeth		Dimensions (inch)									Number of Insert		
													Bottom Cutting Edge A	Bottom Cutting Edge B	Peripheral Cutting Edge
	R	Flutes	Total	DC	LF	DCON	CBDP	DAH	BD	KWW	L8	APMX	JPMX 140412-○○	MPMX 120412-○○	SPMX 120408-○○
SPX4UR2524CA22A	●	4	24	2.500	3.500	1.000	1.339	.539	2.375	.375	.219	2.280	2	2	20
SPX4UR0324DA22A	●	4	24	3.000	3.500	1.250	1.654	.669	2.874	.500	.281	2.280	2	2	20

★1 In case of internal coolant supply, please use a face mill arbor with through coolant channels. Regular center-thru or side-thru arbors can't be used.
★2 The cutter body includes a set bolt for an arbor.

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

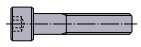




METRIC Standard

For inch arbors

Right hand tool holder only.

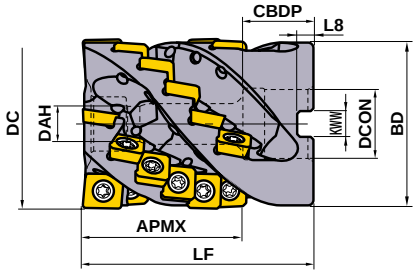
DC	Set Bolt	Geometry
ϕ63mm	HSC12070	
ϕ80mm	HSC16065	

SHELL TYPE

Order Number	Stock	Number of Teeth		Dimensions (mm) [inch]									Number of Insert		
													Bottom Cutting Edge A	Bottom Cutting Edge B	Peripheral Cutting Edge
	R	Flutes	Total	DC	LF	DCON	CBDP	DAH	BD	KWW	L8	APMX	JPMX 140412-○○	MPMX 120412-○○	SPMX 120408-○○
SPX4R06324CA058A	★	4	24	63	85	25.4 [1.000″]	26	13	60	9.5	6	58	2	2	20
SPX4R08024DA058A	★	4	24	80	85	31.75 [1.250″]	38	17	76.8	12.7	8	58	2	2	20

★1 In case of internal coolant supply, please use a face mill arbor with through coolant channels. Regular center-thru or side-thru arbors can't be used.
★2 Set bolt not included.





METRIC Standard

For metric arbors

The bore diameter (DCON) is equivalent to a metric size.

Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ63mm	HSC12070	
ϕ80mm	HSC16065	

SHELL TYPE

Order Number	Stock	Number of Teeth		Dimensions (mm)									Number of Insert		
													Bottom Cutting Edge A	Bottom Cutting Edge B	Peripheral Cutting Edge
	R	Flutes	Total	DC	LF	DCON	CBDP	DAH	BD	KWW	L8	APMX	JPMX 140412-○○	MPMX 120412-○○	SPMX 120408-○○
SPX4-063A24A058RA	★	4	24	63	85	27	28	13	60	12.4	7	58	2	2	20
SPX4-080A24A058RA	★	4	24	80	85	32	40	17	76.8	14.4	8	58	2	2	20

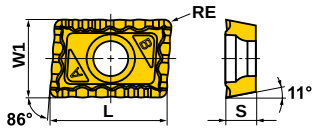
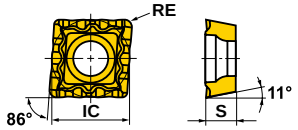
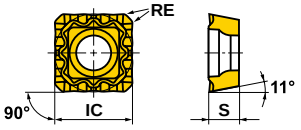
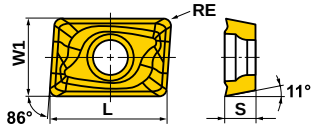
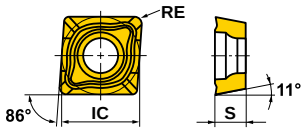
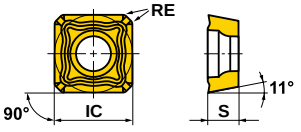
★1 In case of internal coolant supply, please use a face mill arbor with through coolant channels. Regular center-thru or side-thru arbors can't be used.
★2 Set bolt not included.

SPARE PARTS

Holder	 ★1 Insert Screw	 Wrench	 Insert Bottom Cutting Edge A	 Insert Bottom Cutting Edge B	 Insert Peripheral Cutting Edge
SPX	TS55	TKY25D	JPMX190412-WH	MPMX120412-WH	SPMX120408-WH
			JPMX190412-JM	MPMX120412-JM	SPMX120408-JM

★ Clamp Torque (lbf-in) : TS55=66

INSERTS

Type		Shape	Order Number	Class	Coated				Dimensions (inch)					Geometry
					VP15TF	VP20RT			L	W1	IC	S	RE	
Wavy Cutting Edge Type	Bottom Cutting Edge A		**JPMX190412-WH**	M	●	●			.750	.500	—	.187	.047	
			✱ **JPMX140412-WH**	M	●	●			.563	.500	—	.187	.047	
	Bottom Cutting Edge B		**MPMX120412-WH**	M	●	●			—	—	.500	.187	.047	
	Peripheral Cutting Edge		**SPMX120408-WH**	M	●	●			—	—	.500	.187	.031	
Straight Cutting Edge Type	Bottom Cutting Edge A		**JPMX190412-JM**	M	●	●			.750	.500	—	.187	.047	
			✱ **JPMX140412-JM**	M	●	●			.563	.500	—	.187	.047	
	Bottom Cutting Edge B		**MPMX120412-JM**	M	●	●			—	—	.500	.187	.047	
	Peripheral Cutting Edge		**SPMX120408-JM**	M	●	●			—	—	.500	.187	.031	

✱ Only for use with a shell type holder.

● : Inventory maintained.



RECOMMENDED CUTTING CONDITIONS (Shank Type)

CUTTING CONDITIONS FOR SHOULDER MILLING (Number of effective flutes is 2.)

	Work Material	Hardness	Insert Grade/Breaker	Cutting Speed **vc** (SFM)	Width of Cut **ae** (inch)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (IPT)
P	Mild Steel	≤180HB	**VP15TF WH**	395 (330—460)	<.197	<4DC	.006—.010
			VP15TF JM	395 (330—460)	<.394	<2DC	.006—.010
	Carbon Steel Alloy Steel	180—350HB	**VP15TF WH**	260 (230—395)	<.197	<4DC	.006—.010
			VP15TF JM	260 (230—395)	<.394	<2DC	.006—.010
	Alloy Tool Steel	≤300HB	**VP15TF WH**	260 (200—330)	<.197	<4DC	.004—.008
			VP15TF JM	260 (200—330)	<.394	<2DC	.004—.008
M	Stainless Steel	≤200HB	**VP20RT WH**	260 (230—395)	<.197	<4DC	.004—.008
			VP20RT JM	260 (230—395)	<.394	<2DC	.004—.008
K	Cast Iron	Tensile Strength ≤350MPa	**VP15TF WH**	330 (260—395)	<.197	<4DC	.006—.016
			VP15TF JM	330 (260—395)	<.197	<4DC	.004—.010
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF WH**	260 (200—330)	<.197	<4DC	.006—.014
			VP15TF JM	260 (200—330)	<.197	<4DC	.004—.008
S	Titanium Alloy	≤350HB	**VP20RT WH**	130 (115—165)	<.197	<4DC	.003—.005
			VP20RT JM	130 (115—165)	<.394	<2DC	.003—.005

(Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust processing conditions if the vibration is generated.

(Note 2) For tools with a cutting edge length of 7.87″ or more, please reduce the cutting speed and table feed by 10-20% and the width of cut by 50%.

(Note 3) If the cutting angle between the tool and workpiece exceeds 90º when machining corners ,Reduce the cutting speed and table feed by 10-20% and ae by 50%. Also if possible, set a radius cutting path for corners.

CUTTING CONDITIONS FOR SLOT MILLING

	Work Material	Hardness	Insert Grade/Breaker	Cutting Speed **vc** (SFM)	Width of Cut **ae** (inch)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (IPT)
P	Mild Steel	≤180HB	**VP15TF WH**	200 (165—395)	DC	<.394	.004—.010
			VP15TF JM	200 (165—395)	DC	<.394	.004—.006
	Carbon Steel Alloy Steel	180—350HB	**VP15TF WH**	200 (165—330)	DC	<.394	.004—.010
			VP15TF JM	200 (165—330)	DC	<.394	.004—.006
	Alloy Tool Steel	≤300HB	**VP15TF WH**	165 (130—260)	DC	<.394	.004—.010
			VP15TF JM	165 (130—260)	DC	<.394	.004—.006
M	Stainless Steel	≤200HB	**VP20RT WH**	200 (165—395)	DC	<.394	.004—.010
			VP20RT JM	200 (165—395)	DC	<.394	.004—.006
K	Cast Iron	Tensile Strength ≤350MPa	**VP15TF WH**	165 (130—260)	DC	<1.969	.006—.010
			VP15TF JM	165 (130—260)	DC	<1.575	.004—.008
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF WH**	130 (115—260)	DC	<1.575	.006—.010
			VP15TF JM	130 (115—260)	DC	<1.181	.004—.008
S	Titanium Alloy	≤350HB	**VP20RT WH**	115 (100—165)	DC	<.394	.003—.005
			VP20RT JM	115 (100—165)	DC	<.394	.003—.005

(Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust processing conditions if the vibration is generated.



RECOMMENDED CUTTING CONDITIONS (Shell Type)

CUTTING CONDITIONS FOR SHOULDER MILLING (Number of effective flutes is 4.)

	Work Material	Hardness	Insert Grade/Breaker	Cutting Speed **vc** (SFM)	Width of Cut **ae** (inch)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (IPT)
P	Mild Steel	≤180HB	**VP15TF JM**	395 (330—460)	<.394	<0.5DC	.006—.012
				395 (330—460)	<.394	>0.5DC	.006—.010
	Carbon Steel Alloy Steel	180—350HB	**VP15TF JM**	395 (260—425)	<.394	<0.5DC	.006—.012
				330 (260—395)	<.394	>0.5DC	.006—.010
	Alloy Tool Steel	≤300HB	**VP15TF JM**	330 (200—360)	<.394	<0.5DC	.004—.010
				260 (200—330)	<.394	>0.5DC	.004—.006
M	Stainless Steel	≤200HB	**VP20RT JM**	460 (330—490)	<.394	<0.5DC	.004—.010
				395 (330—460)	<.394	>0.5DC	.004—.008
K	Cast Iron	Tensile Strength ≤350MPa	**VP15TF WH**	395 (260—425)	<.394	<0.5DC	.010—.016
				330 (260—395)	<.394	>0.5DC	.010—.016
			VP15TF JM	395 (260—425)	<.394	<0.5DC	.006—.012
				330 (260—395)	<.394	>0.5DC	.006—.010
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF WH**	330 (200—360)	<.394	<0.5DC	.008—.014
				260 (200—360)	<.394	>0.5DC	.008—.014
			VP15TF JM	330 (200—395)	<.394	<0.5DC	.006—.012
				260 (200—395)	<.394	>0.5DC	.006—.012
S	Titanium Alloy	≤350HB	**VP20RT JM**	150 (115—165)	<.394	<0.5DC	.003—.004
				150 (115—165)	<.394	>0.5DC	.003—.004

(Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece, where no vibration occurred.
Please adjust processing conditions if the vibration is generated.

CUTTING CONDITIONS FOR SLOT MILLING

	Work Material	Hardness	Insert Grade/Breaker	Cutting Speed **vc** (SFM)	Width of Cut **ae** (inch)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (IPT)
P	Mild Steel	≤180HB	**VP15TF JM**	395 (330—460)	DC	<0.25DC	.006—.010
	Carbon Steel Alloy Steel	180—350HB	**VP15TF JM**	330 (260—395)	DC	<0.25DC	.006—.010
	Alloy Tool Steel	≤300HB	**VP15TF JM**	260 (200—330)	DC	<.394	.004—.008
M	Stainless Steel	≤200HB	**VP20RT JM**	330 (260—460)	DC	<.394	.004—.006
K	Cast Iron	Tensile Strength ≤350MPa	**VP15TF WH**	260 (200—330)	DC	<0.25DC	.004—.010
				200 (165—330)	DC	<0.6DC	.004—.008
			VP15TF JM	260 (200—330)	DC	<0.25DC	.004—.008
				200 (165—330)	DC	<0.6DC	.004—.006
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF WH**	260 (200—330)	DC	<0.25DC	.004—.010
				200 (165—330)	DC	<0.5DC	.004—.008
			VP15TF JM	260 (200—330)	DC	<0.25DC	.004—.008
				200 (165—330)	DC	<0.5DC	.004—.006
S	Titanium Alloy	≤350HB	**VP20RT JM**	130 (115—165)	DC	<0.25DC	.002—.004

(Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece, where no vibration occurred.
Please adjust processing conditions if the vibration is generated.

Memo

DEEP SHOULDER MILLING
<CUTTING FOR TITANIUM ALLOY>

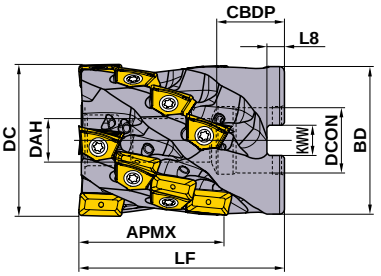
Roughing

VFX5

P M K N **S** H



- Vertical inserts with high strength cutting edge.
- Screw-on type clamping.
- High efficiency milling of titanium alloys.



Right hand tool holder only.

SHELL TYPE

Order Number	Stock	Number of Flutes	Total Inserts	Dimensions (inch)									WT* (lbs)
	R			DC	LF	DCON	CBDP	DAH	BD	KWW	L8	APMX	
VFX5UR0203CA10	●	3	6	2.0	2.0	1.00	.95	.520	1.929	.375	.219	1.0	.20
VFX5UR**0203CA15**	●	3	9	2.0	2.5	1.00	1.00	.520	1.929	.375	.219	1.5	.26
VFX5UR**0204AA10**	●	4	8	2.0	2.0	.75	.75	.395	1.929	.313	.187	1.0	.24
VFX5UR**0204AA15**	●	4	12	2.0	2.5	.75	.75	.395	1.929	.313	.187	1.5	.30
VFX5UR**0204CA15**	●	4	12	2.0	2.5	1.00	1.00	.520	1.929	.375	.219	1.5	.27
VFX5UR**0204AA20**	●	4	16	2.0	2.75	.75	.75	.395	1.929	.313	.187	2.0	.32
VFX5UR**0204CA20**	●	4	16	2.0	3.0	1.00	1.00	.520	1.929	.375	.219	2.0	.33
VFX5UR**2505CA10**	●	5	10	2.5	2.5	1.00	1.25	.520	2.421	.375	.219	1.0	.49
VFX5UR**2505CA24**	●	5	25	2.5	3.5	1.00	1.25	.520	2.421	.375	.219	2.4	.68
VFX5UR**0306DA29**	●	6	36	3.0	4.25	1.25	1.375	.645	2.894	.500	.281	2.9	1.21

* WT : Mass

SPARE PARTS

Order Number	*2				*3				Number of Insert	
	Clamp Screw	Number	Seal Washer	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	Set Bolt	End cutting edge XNMU1607○○R-○○	Peripheral *1 cutting edge XNMU1607 08R-○○
VFX5UR0203CA10	TS352	6	WU500-S1	TKY10D	HSD04004H08	9	MK1KS	HSCUF50014	3	3
VFX5UR**0203CA15**	TS352	9	WU500-S1	TKY10D	HSD04004H08	12	MK1KS	HSCUF50018	3	6
VFX5UR**0204AA10**	TS352	8	WU375-S1	TKY10D	HSD04004H08	12	MK1KS	HSCUF37513	4	4
VFX5UR**0204AA15**	TS352	12	WU375-S1	TKY10D	HSD04004H08	16	MK1KS	HSCUF37520	4	8
VFX5UR**0204CA15**	TS352	12	WU500-S1	TKY10D	HSD04004H08	16	MK1KS	HSCUF50018	4	8
VFX5UR**0204AA20**	TS352	16	WU375-S1	TKY10D	HSD04004H08	20	MK1KS	HSCUF37520	4	12
VFX5UR**0204CA20**	TS352	16	WU500-S1	TKY10D	HSD04004H08	20	MK1KS	HSCUF50023	4	12
VFX5UR**2505CA10**	TS352	10	WU500-S1	TKY10D	HSD04004H08	15	MK1KS	HSCUF50018	5	5
VFX5UR**2505CA24**	TS352	25	WU500-S1	TKY10D	HSD04004H08	30	MK1KS	HSCUF50028	5	20
VFX5UR**0306DA29**	TS352	36	WU625-S1	TKY10D	HSD04004H08	42	MK1KS	HSCUF62535	6	30

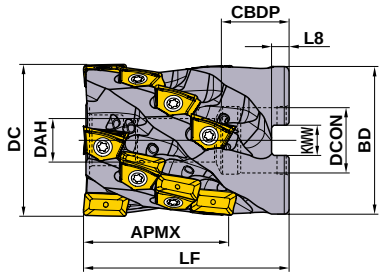
*1. Only corner radius RE.031 can be used.
*2. Clamp Torque (lbf-in) : TS352=22
*3. The .031" nozzels are installed in the standard. Select and use alternate nozzles from below list depending on coolant pressure.
*4. The cutter body includes a set bolt for an arbor.

	≤140PSI (≤5.3gal/min)	←Standard→ (140PSI-720PSI)	≥720PSI (≥7.9gal/min)	≥1000PSI (≥13.2gal/min)
Nozzle Dia.	ø.024"	ø.031"	ø.047"	ø.063"
Order Number	**HSD04004H06**	**HSD04004H08**	**HSD04004H12**	**HSD04004H16**

- Clamp Torque (lbf-in) : HSD0400H○○=13
- The part number for a plug screw without a through nozzle is HSS04004.
- Insert with a corner radius of .125" and above, as corner radius increases the LF dimension increases.
  Corner radius .125": LF+.028" Corner radius .157": LF+.059"

● : Inventory maintained. ★ : Inventory maintained in Japan.





METRIC Standard

For metric arbors

Right hand tool holder only.

SHELL TYPE

Order Number	Stock	Number of Flutes	Total Inserts	Dimensions (mm)									WT (kg) *
	R			DC	LF	DCON	CBDP	DAH	BD	KWW	L8	APMX	
VFX5-040A03A026R	★	3	6	40	50	16	21	8.5	38.2	8.4	5.6	26	0.3
VFX5-040A03A038R	★	3	9	40	60	16	21	8.5	38.2	8.4	5.6	38	0.4
VFX5-050X03A026R	★	3	6	50	50	27	23	12.5	48.2	12.4	7.0	26	0.4
VFX5-050X03A038R	★	3	9	50	60	27	23	12.5	48.2	12.4	7.0	38	0.5
VFX5-050A04A026R	★	4	8	50	50	22	21	10.5	48.2	10.4	6.3	26	0.5
VFX5-050A04A038R	★	4	12	50	60	22	21	10.5	48.2	10.4	6.3	38	0.6
VFX5-050X04A038R	★	4	12	50	60	27	23	12.5	48.2	12.4	7.0	38	0.5
VFX5-050A04A050R	★	4	16	50	70	22	21	10.5	48.2	10.4	6.3	50	0.7
VFX5-063A05A026R	★	5	10	63	60	27	28	12.5	61	12.4	7.0	26	1.0
VFX5-063A05A063R	★	5	25	63	85	27	28	12.5	61	12.4	7.0	63	1.4
VFX5-080A06A075R	★	6	36	80	100	32	28	16.5	77.3	14.4	8.0	75	2.8

* WT : Mass

SPARE PARTS

Order Number	 *2				 *3				Number of Insert	
									End cutting edge	Peripheral *1 cutting edge
	Clamp Screw	Number	Seal Washer	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	Set Bolt	XNMU1607 ○○R-○○	XNMU1607 08R-○○
VFX5-040A03A026R	TS352	6	W8-S1	TKY10D	HSD04004H08	9	MK1KS	HSC08040	3	3
VFX5-040A03A038R	TS352	9	W8-S1	TKY10D	HSD04004H08	12	MK1KS	HSC08050	3	6
VFX5-050X03A026R	TS352	6	W12-S1	TKY10D	HSD04004H08	9	MK1KS	HSC12035	3	3
VFX5-050X03A038R	TS352	9	W12-S1	TKY10D	HSD04004H08	12	MK1KS	HSC12045	3	6
VFX5-050A04A026R	TS352	8	W10-S1	TKY10D	HSD04004H08	12	MK1KS	HSC10035	4	4
VFX5-050A04A038R	TS352	12	W10-S1	TKY10D	HSD04004H08	16	MK1KS	HSC10045	4	8
VFX5-050X04A038R	TS352	12	W12-S1	TKY10D	HSD04004H08	16	MK1KS	HSC12045	4	8
VFX5-050A04A050R	TS352	16	W10-S1	TKY10D	HSD04004H08	20	MK1KS	HSC10055	4	12
VFX5-063A05A026R	TS352	10	W12-S1	TKY10D	HSD04004H08	15	MK1KS	HSC12045	5	5
VFX5-063A05A063R	TS352	25	W12-S1	TKY10D	HSD04004H08	30	MK1KS	HSC12070	5	20
VFX5-080A06A075R	TS352	36	W16-S1	TKY10D	HSD04004H08	42	MK1KS	HSC16080	6	30

*1. Only corner radius RE.031 can be used.
*2. Clamp Torque (lbf-in) : TS352=22
*3. The .031" nozzels are installed in the standard. Select and use alternate nozzles from below list depending on coolant pressure.
*4. Set bolt not included.

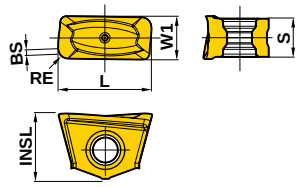
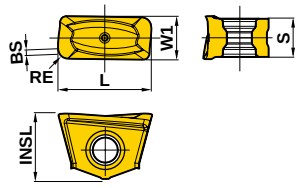
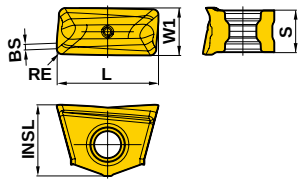
	≤140PSI (≤5.3gal/min)	←Standard→ (140PSI-720PSI)	≥720PSI (≥7.9gal/min)	≥1000PSI (≥13.2gal/min)
Nozzle Dia.	ø.024"	ø.031"	ø.047"	ø.063"
Order Number	**HSD04004H06**	**HSD04004H08**	**HSD04004H12**	**HSD04004H16**

- Clamp Torque (lbf-in) : HSD0400H○○=13
- The part number for a plug screw without a through nozzle is HSS04004.
- Insert with a corner radius of .125" and above, as corner radius increases the LF dimension increases.
  Corner radius .125": LF+.028" Corner radius .157": LF+.059"

MILLING

INSERTS ➤ K092
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS

Shape	Order Number	Stock (Coated) MP9030	Stock (Coated) MP9130			L	W1	INSL	S	BS	RE	Geometry
	**XNMU160708R-MS**	●				.630	.276	.437	.256	.039	.031	
	XNMU160712R-MS	●				.630	.276	.437	.256	.039	.047	
	XNMU160716R-MS	●				.630	.276	.437	.256	.039	.063	
	XNMU160724R-MS	●				.630	.276	.437	.256	.039	.094	
	✱ **XNMU160732R-MS**	●				.681	.276	.437	.256	—	.126	
	✱ **XNMU160740R-MS**	●				.744	.276	.437	.256	—	.157	
	**XNMU160708R-HS**	●				.630	.276	.437	.256	.039	.031	
	**XNMU160708R-LS**		●			.630	.276	.437	.256	.039	.031	

✱ Note for insert with a corner radius of .125" and above, as corner radius increases the LF dimension increases.
Corner radius .125": LF+.028" Corner radius .157": LF+.059"

■ = MIRACLE SIGMA

● : Inventory maintained.
<10 inserts in one case>

RECOMMENDED CUTTING CONDITIONS

VFX5

	Work Material	Cutting Edge Diameter (inch)	Number of Flutes	Recommended Insert	Cutting Speed **vc** (SFM)	Revolution **n** (min^{-1})	Depth of Cut **ap** (inch)	Cutting Width **ae** (inch)	Feed per Tooth **fz** (inch/t)	Table Feed **vf** (inch/min)	Chip Removal Rate **Q** ($inch^3$/min)	Estimated cutting power **PC** (HP)	Expected Torque (lbf-ft)	Tool life ratio (%)
S	Titanium Alloy (Ti6Al4V)	**ϕ2.0**	3	LS	130	248	1.496	2.000	.004	2.932	9	8.6	182	40
			4	MS	165	315	1.969	1.200	.004	4.963	12	10.7	178	60
			4	MS	195	372	1.969	.800	.004	5.865	9	8.0	113	80
			4	HS	195	372	1.969	.400	.005	7.038	6	5.2	74	100
		ϕ2.5	5	LS	130	199	2.362	2.500	.004	3.910	23	22.3	590	40
			5	MS	165	252	2.362	1.500	.004	4.963	18	15.9	332	60
			5	MS	195	298	2.362	1.000	.004	5.865	14	12.0	212	80
			5	HS	195	298	2.362	.500	.005	7.038	8	7.8	137	100
		ϕ3.0	6	LS	130	166	2.953	3.000	.004	3.910	35	33.2	1055	40
			6	MS	165	210	2.953	1.800	.004	4.963	26	23.8	594	60
			6	MS	195	248	2.953	1.200	.004	5.865	21	17.9	379	80
			6	HS	195	248	2.953	.600	.005	7.038	12	11.6	246	100
	Titanium Alloy (Ti-5553)	**ϕ2.0**	3	LS	80	153	2.953	2.000	.003	1.444	9	8.5	292	30
			4	MS	80	153	2.953	1.200	.003	1.925	7	6.5	224	50
			4	MS	100	191	2.953	.800	.004	3.008	7	6.5	178	70
			4	HS	100	191	2.953	.400	.004	3.008	4	3.6	98	80
		ϕ2.5	5	LS	80	122	2.953	2.500	.003	1.925	14	14.1	608	30
			5	MS	80	122	2.953	1.500	.003	1.925	9	8.1	350	50
			5	MS	100	153	2.953	1.000	.004	3.008	9	8.1	278	70
			5	HS	100	153	2.953	.500	.004	3.008	4	4.5	154	80
		ϕ3.0	6	LS	80	102	3.543	3.000	.003	1.925	20	20.1	1035	30
			6	MS	80	102	3.543	1.800	.003	1.925	12	11.5	595	50
			6	MS	100	127	3.543	1.200	.004	3.008	13	11.5	474	70
			6	HS	100	127	3.543	.600	.004	3.008	6	6.3	262	80

VFX5 (METRIC Standard)

	Work Material	Cutting Edge Diameter (inch)	Number of Flutes	Recommended Insert	Cutting Speed **vc** (SFM)	Revolution **n** (min^{-1})	Depth of Cut **ap** (inch)	Cutting Width **ae** (inch)	Feed per Tooth **fz** (inch/t)	Table Feed **vf** (inch/min)	Chip Removal Rate **Q** ($inch^3$/min)	Estimated cutting power **PC** (HP)	Expected Torque (lbf-ft)	Tool life ratio (%)
S	Titanium Alloy (Ti6Al4V)	**ϕ40**	3	LS	130	315	1.496	1.575	.004	3.724	9	8.6	143	40
			3	MS	165	400	1.496	.945	.004	4.727	7	6.1	80	60
			3	MS	195	473	1.496	.630	.004	5.586	5	4.6	51	80
			3	HS	195	473	1.496	.315	.005	6.704	3	3.0	33	100
		ϕ50	3	LS	130	252	1.496	1.969	.004	2.979	9	8.6	179	40
			4	MS	165	320	1.969	1.181	.004	5.042	12	10.7	175	60
			4	MS	195	378	1.969	.787	.004	5.959	9	8.0	112	80
			4	HS	195	378	1.969	.394	.005	7.151	6	5.2	72	100
		ϕ63	5	LS	130	200	2.362	2.480	.004	3.941	23	22.3	585	40
			5	MS	165	254	2.362	1.488	.004	5.002	18	15.9	329	60
			5	MS	195	300	2.362	.992	.004	5.911	14	12.0	210	80
			5	HS	195	300	2.362	.496	.005	7.094	8	7.8	136	100
		ϕ80	6	LS	130	158	2.953	3.150	.004	3.724	35	33.2	1107	40
			6	MS	165	200	2.953	1.890	.004	4.727	26	23.8	624	60
			6	MS	195	236	2.953	1.260	.004	5.586	21	17.9	398	80
			6	HS	195	236	2.953	.630	.005	6.704	12	11.6	258	100
	Titanium Alloy (Ti-5553)	**ϕ40**	3	LS	80	194	2.362	1.575	.003	1.833	7	6.8	185	30
			3	MS	80	194	2.362	.945	.003	1.833	4	3.9	106	50
			3	MS	100	243	2.362	.630	.004	2.865	4	3.9	85	70
			3	HS	100	243	2.362	.315	.004	2.865	2	2.2	47	80
		ϕ50	3	LS	80	155	2.953	1.969	.003	1.467	9	8.5	287	30
			4	MS	80	155	2.953	1.181	.003	1.956	7	6.5	220	50
			4	MS	100	194	2.953	.787	.004	3.056	7	6.5	175	70
			4	HS	100	194	2.953	.394	.004	3.056	4	3.6	97	80
		ϕ63	5	LS	80	123	2.953	2.480	.003	1.940	14	14.1	603	30
			5	MS	80	123	2.953	1.488	.003	1.940	9	8.1	347	50
			5	MS	100	154	2.953	.992	.004	3.032	9	8.1	276	70
			5	HS	100	154	2.953	.496	.004	3.032	4	4.5	153	80
		ϕ80	6	LS	80	97	3.543	3.150	.003	1.833	20	20.1	1086	30
			6	MS	80	97	3.543	1.890	.003	1.833	12	11.5	625	50
			6	MS	100	121	3.543	1.260	.004	2.865	13	11.5	498	70
			6	HS	100	121	3.543	.630	.004	2.865	6	6.3	275	80

∗1 Please note that machining performance varies depending to the conditions such as machine rigidity, work clamping rigidity, coolant supply system, pressure and flow volume etc.
∗2 Internal coolant is recommended. Please use an FMH type arbor for through coolant. Using external coolant in combination with through coolant is even more effective.
∗3 The reference of tool life which we mentioned on the tables,"tool life ratio 100(%)" is when "ae = 20(%) of tool diameter".
If "ae" will be bigger than 20(%) of tool diameter,tool life will decrease in "tool life ratio" on the tables.
∗4 The maximum depth of cut (ap) varies according to the machine rigidity and power.

DEEP SHOULDER MILLING
<CUTTING FOR TITANIUM ALLOY>

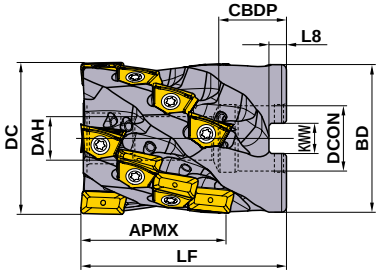
Roughing

VFX6

P M K N **S** H



- Vertical inserts with high strength cutting edge.
- Screw-on type clamping.
- High efficiency milling of titanium alloys.



Right hand tool holder only.

SHELL TYPE

Order Number	Stock	Number of Flutes	Total	Dimensions (inch)									WT (lbs) *
	R			DC	LF	DCON	CBDP	DAH	BD	KWW	L8	APMX	
VFX6UR2504CA12	●	4	8	2.5	2.5	1.00	1.25	.520	2.421	.375	.219	1.2	.21
VFX6UR**2504CA23**	●	4	16	2.5	3.5	1.00	1.25	.520	2.421	.375	.219	2.3	.29
VFX6UR**0305DA12**	●	5	10	3.0	2.5	1.25	1.375	.645	2.894	.500	.281	1.2	.30
VFX6UR**0305DA29**	●	5	25	3.0	4.25	1.25	1.375	.645	2.894	.500	.281	2.9	.52
VFX6UR**0406EA12**	●	6	12	4.0	3.0	1.50	1.50	.770	3.866	.625	.375	1.2	.69
VFX6UR**0406EA35**	●	6	36	4.0	5.0	1.50	1.50	.770	3.866	.625	.375	3.5	1.16

* WT : Mass

SPARE PARTS

Order Number	*2				*3				Number of Insert	
	Clamp Screw	Number	Seal Washer	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	Set Bolt	End cutting edge	Peripheral *1 cutting edge
									XNMU1909 ○○R-○○	**XNMU1909 12R-○○**
VFX6UR2504CA12	TS450	8	WU500-S1	TKY20T	HSD04004H08	12	MK1KS	HSCUF50018	4	4
VFX6UR**2504CA23**	TS450	16	WU500-S1	TKY20T	HSD04004H08	20	MK1KS	HSCUF50028	4	12
VFX6UR**0305DA12**	TS450	10	WU625-S1	TKY20T	HSD04004H08	15	MK1KS	HSCUF62518	5	5
VFX6UR**0305DA29**	TS450	25	WU625-S1	TKY20T	HSD04004H08	30	MK1KS	HSCUF62535	5	20
VFX6UR**0406EA12**	TS450	12	WU750-S1	TKY20T	HSD04004H08	18	MK1KS	HSCUF75018	6	6
VFX6UR**0406EA35**	TS450	36	WU750-S1	TKY20T	HSD04004H08	42	MK1KS	HSCUF75040	6	30

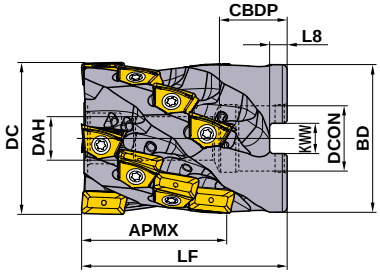
*1. Only corner radius RE.047" can be used.
*2. Clamp Torque (lbf-in) : TS450=44
*3. The .031" nozzels are installed in the standard. Select and use alternate nozzles from below list depending on coolant pressure.
*4. The cutter body includes a set bolt for an arbor.

	≤140PSI (≤5.3gal/min)	**←Standard→ (140PSI-720PSI)**	**≥720PSI (≥7.9gal/min)**	**≥1000PSI (≥13.2gal/min)**
Nozzle Dia.	ø.024"	ø.031"	ø.047"	ø.063"
Order Number	**HSD04004H06**	**HSD04004H08**	**HSD04004H12**	**HSD04004H16**

- Clamp Torque (lbf-in) : HSD0400H○○=13
- The part number for a plug screw without a through nozzle is HSS04004.
- Insert with a corner radius of .125" and above, as corner radius increases the LF dimension increases.
  Corner radius .125": LF+.028" Corner radius .157": LF+.059" Corner radius .197": LF+.059"

● : Inventory maintained. ★ : Inventory maintained in Japan.





METRIC Standard

For metric arbors

Right hand tool holder only.

SHELL TYPE

Order Number	Stock	Number of Flutes	Total	Dimensions (mm)									WT (kg) *
	R			DC	LF	DCON	CBDP	DAH	BD	KWW	L8	APMX	
VFX6-063A04A031R	★	4	8	63	60	27	28	12.5	61	12.4	7	31	0.9
VFX6-063A04A060R	★	4	16	63	85	27	28	12.5	61	12.4	7	60	1.3
VFX6-080A05A031R	★	5	10	80	60	32	28	16.5	77.3	14.4	8	31	1.5
VFX6-080A05A075R	★	5	25	80	100	32	28	16.5	77.3	14.4	8	75	2.6
VFX6-100A06A031R	★	6	12	100	65	40	30	20.5	96.6	16.4	9	31	2.7
VFX6-100A06A090R	★	6	36	100	115	40	30	20.5	96.6	16.4	9	90	4.8

* WT : Mass

SPARE PARTS

Order Number	*2				*3				Number of Insert	
	Clamp Screw	Number	Seal Washer	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	Set Bolt	End cutting edge XNMU1607 ○○R-○○	Peripheral *1 cutting edge XNMU1607 08R-○○
VFX6-063A04A031R	TS450	8	W12-S1	TKY20T	HSD04004H08	12	MK1KS	HSC12045	4	4
VFX6-063A04A060R	TS450	16	W12-S1	TKY20T	HSD04004H08	20	MK1KS	HSC12070	4	12
VFX6-080A05A031R	TS450	10	W16-S1	TKY20T	HSD04004H08	15	MK1KS	HSC16040	5	5
VFX6-080A05A075R	TS450	25	W16-S1	TKY20T	HSD04004H08	30	MK1KS	HSC16080	5	20
VFX6-100A06A031R	TS450	12	W20-S1	TKY20T	HSD04004H08	18	MK1KS	HSC20040	6	6
VFX6-100A06A090R	TS450	36	W20-S1	TKY20T	HSD04004H08	42	MK1KS	HSC20090	6	30

*1. Only corner radius RE.047" can be used.
*2. Clamp Torque (lbf-in) : TS450=44
*3. The .031" nozzels are installed in the standard. Select and use alternate nozzles from below list depending on coolant pressure.
*4. Set bolt not included.

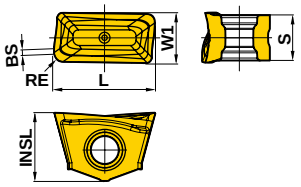
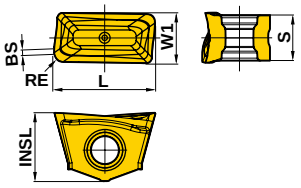
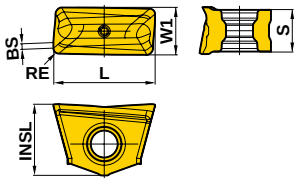
	≤140PSI (≤5.3gal/min)	←Standard→ (140PSI-720PSI)	≥720PSI (≥7.9gal/min)	≥1000PSI (≥13.2gal/min)
Nozzle Dia.	ø.024"	ø.031"	ø.047"	ø.063"
Order Number	**HSD04004H06**	**HSD04004H08**	**HSD04004H12**	**HSD04004H16**

- Clamp Torque (lbf-in) : HSD0400H○○=13
- The part number for a plug screw without a through nozzle is HSS04004.
- Insert with a corner radius of .125" and above, as corner radius increases the LF dimension increases.
  Corner radius .125": LF+.028" Corner radius .157": LF+.059" Corner radius .197": LF+.059"

MILLING

INSERTS ➤ K096
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS

Shape	Order Number	Stock (Coated) MP9030	Stock (Coated) MP9130			Dimensions (inch) L	W1	INSL	S	BS	RE	Geometry
	XNMU190912R-MS	●				.752	.374	.500	.335	.039	.047	
	XNMU190916R-MS	●				.752	.374	.500	.335	.039	.063	
	XNMU190924R-MS	●				.752	.374	.500	.335	.039	.094	
	* XNMU190932R-MS	●				.795	.374	.500	.335	—	.126	
	* XNMU190940R-MS	●				.858	.374	.500	.335	—	.157	
	* XNMU190950R-MS	●				.858	.374	.500	.335	—	.197	
	XNMU190912R-HS	●				.752	.374	.500	.335	.039	.047	
	XNMU190912R-LS		●			.752	.374	.500	.335	.039	.047	

* Note for insert with a corner radius of .125" and above, as corner radius increases the LF dimension increases.
Corner radius .125": LF+.028" Corner radius .157": LF+.059" Corner radius .197": LF+.059"

■ = MIRACLE SIGMA

● : Inventory maintained.
<10 inserts in one case>

RECOMMENDED CUTTING CONDITIONS

VFX6

	Work Material	Cutting Edge Diameter (inch)	Number of Flutes	Recommended Insert	Cutting Speed **vc** (SFM)	Revolution **n** (min^{-1})	Depth of Cut **ap** (inch)	Cutting Width **ae** (inch)	Feed per Tooth **fz** (inch/t)	Table Feed **vf** (inch/min)	Chip Removal Rate **Q** ($inch^3$/min)	Estimated cutting power **PC** (HP)	Expected Torque (lbf-ft)	Tool life ratio (%)
S	Titanium Alloy (Ti6Al4V)	**ϕ2.5**	4	LS	130	199	2.362	2.500	.004	3.128	18	17.8	472	40
			4	MS	165	252	2.362	1.500	.004	3.970	14	12.7	266	60
			4	MS	195	298	2.362	1.000	.004	4.692	11	9.6	170	80
			4	HS	195	298	2.362	.500	.005	5.630	7	6.2	110	100
		ϕ3.0	5	LS	130	166	2.953	3.000	.004	3.258	29	27.7	879	40
			5	MS	165	210	2.953	1.800	.004	4.136	22	19.8	495	60
			5	MS	195	248	2.953	1.200	.004	4.887	17	14.9	316	80
			5	HS	195	248	2.953	.600	.005	5.865	10	9.7	205	100
		ϕ4.0	6	LS	130	124	3.543	4.000	.004	2.932	42	39.3	1663	40
			6	MS	165	158	3.543	2.400	.004	3.722	32	28.1	937	60
			6	MS	195	186	3.543	1.600	.004	4.399	25	21.2	599	80
			6	HS	195	186	3.543	.800	.005	5.278	15	13.8	388	100
	Titanium Alloy (Ti-5553)	**ϕ2.5**	4	LS	80	122	2.362	2.500	.003	1.540	9	9.1	392	30
			4	MS	80	122	2.362	1.500	.003	1.540	5	5.2	225	50
			4	MS	100	153	2.362	1.000	.004	2.406	6	5.2	179	70
			4	HS	100	153	2.362	.500	.004	2.406	3	2.9	99	80
		ϕ3.0	5	LS	80	102	2.953	3.000	.003	1.604	14	14.1	730	30
			5	MS	80	102	2.953	1.800	.003	1.604	9	8.1	419	50
			5	MS	100	127	2.953	1.200	.004	2.506	9	8.1	334	70
			5	HS	100	127	2.953	.600	.004	2.506	4	4.5	185	80
		ϕ4.0	6	LS	80	76	3.543	4.000	.003	1.444	20	20.1	1380	30
			6	MS	80	76	3.543	2.400	.003	1.444	12	11.5	794	50
			6	MS	100	95	3.543	1.600	.004	2.256	13	11.5	632	70
			6	HS	100	95	3.543	.800	.004	2.256	6	6.3	349	80

VFX6 (METRIC Standard)

	Work Material	Cutting Edge Diameter (mm)	Number of Flutes	Recommended Insert	Cutting Speed **vc** (SFM)	Revolution **n** (min^{-1})	Depth of Cut **ap** (inch)	Cutting Width **ae** (inch)	Feed per Tooth **fz** (inch/t)	Table Feed **vf** (inch/min)	Chip Removal Rate **Q** ($inch^3$/min)	Estimated cutting power **PC** (HP)	Expected Torque (lbf-ft)	Tool life ratio (%)
S	Titanium Alloy (Ti6Al4V)	**ϕ63**	4	LS	130	200	2.362	2.480	.004	3.153	18	17.8	468	40
			4	MS	165	254	2.362	1.488	.004	4.002	14	12.7	263	60
			4	MS	195	300	2.362	.992	.004	4.729	11	9.6	168	80
			4	HS	195	300	2.362	.496	.005	5.675	7	6.2	109	100
		ϕ80	5	LS	130	158	2.953	3.150	.004	3.104	29	27.7	923	40
			5	MS	165	200	2.953	1.890	.004	3.939	22	19.8	520	60
			5	MS	195	236	2.953	1.260	.004	4.655	17	14.9	332	80
			5	HS	195	236	2.953	.630	.005	5.586	10	9.7	215	100
		ϕ100	6	LS	130	126	3.543	3.937	.004	2.979	42	39.3	1637	40
			6	MS	165	160	3.543	2.362	.004	3.782	32	28.1	923	60
			6	MS	195	189	3.543	1.575	.004	4.469	25	21.2	590	80
			6	HS	195	189	3.543	.787	.005	5.363	15	13.8	382	100
	Titanium Alloy (Ti-5553)	**ϕ63**	4	LS	80	123	2.362	2.480	.003	1.552	9	9.1	389	30
			4	MS	80	123	2.362	1.488	.003	1.552	5	5.2	223	50
			4	MS	100	154	2.362	.992	.004	2.425	6	5.2	178	70
			4	HS	100	154	2.362	.496	.004	2.425	3	2.9	98	80
		ϕ80	5	LS	80	97	2.953	3.150	.003	1.528	14	14.1	766	30
			5	MS	80	97	2.953	1.890	.003	1.528	9	8.1	440	50
			5	MS	100	121	2.953	1.260	.004	2.387	9	8.1	350	70
			5	HS	100	121	2.953	.630	.004	2.387	4	4.5	194	80
		ϕ100	6	LS	80	78	3.543	3.937	.003	1.467	20	20.1	1358	30
			6	MS	80	78	3.543	2.362	.003	1.467	12	11.5	781	50
			6	MS	100	97	3.543	1.575	.004	2.292	13	11.5	622	70
			6	HS	100	97	3.543	.787	.004	2.292	6	6.3	344	80

*1 Please note that machining performance varies depending to the conditions such as machine rigidity, work clamping rigidity, coolant supply system, pressure and flow volume etc.
*2 Internal coolant is recommended. Please use an FMH type arbor for through coolant. Using external coolant in combination with through coolant is even more effective.
*3 The reference of tool life which we mentioned on the tables,"tool life ratio 100(%)" is when "ae = 20(%) of tool diameter". If "ae" will be bigger than 20(%) of tool diameter,tool life will decrease in "tool life ratio" on the tables.
*4 The maximum depth of cut (ap) varies according to the machine rigidity and power.

DEEP SHOULDER MILLING

0° Roughing

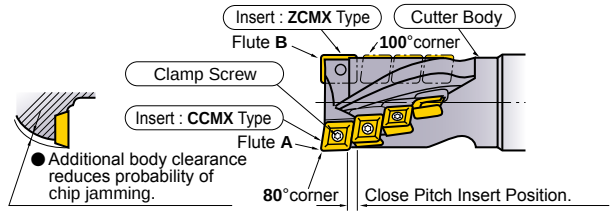
LER

P M K N S H



- Different helical flute angles prevents chattering.
- Suitable for heavy cutting due to holder rigidity.

DESIGN FEATURES OF LER TYPE END MILL



All 4 cutting edges of CCMX insert are utilized,80° corners in flute "A" and 100° corners on flute "B".

Fig.1

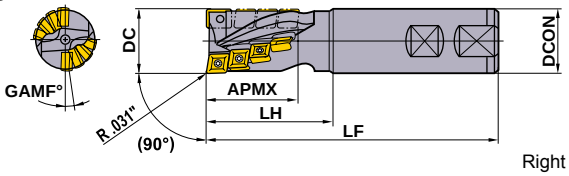
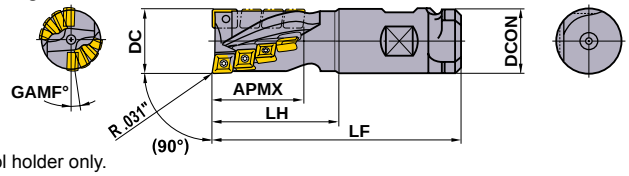


Fig.2 **Combination Shank**



Right hand tool holder only.

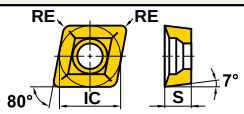
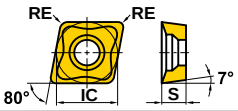
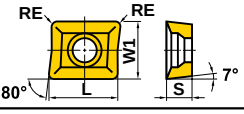
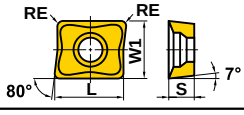
Order Number	Stock	Number of Flute	Number of Teeth	Dimensions (inch)						Type (Fig.)	★	①②	Insert	
	R			DC	LF	DCON	LH	APMX	GAMF°		Insert Screw	Wrench	Insert	Teeth
LER1606W20	●	2	6	1.000	4.281	1.250	2.000	1.063	8°	1	CS300890T	①TKY08F	CCMX083508EN○	5
											CS300890T	②TKY08D	ZCMX083508ER○	1
LER**2008W20**	●	2	8	1.250	4.781	1.250	2.500	1.700	8° 35′	1	CS350990T	①TKY10F	CCMX09T308EN○	7
											CS350990T	②TKY10D	ZCMX09T308ER○	1
LER**2012W20**	●	2	12	1.250	5.531	1.250	3.250	2.480	8° 35′	1	CS350990T	①TKY10F	CCMX09T308EN○	11
											CS350990T	②TKY10D	ZCMX09T308ER○	1
LER**2415W24**	●	3	15	1.500	5.687	1.500	3.000	2.100	5° 27′	1	CS350990T	①TKY10F	CCMX09T308EN○	14
											CS350990T	②TKY10D	ZCMX09T308ER○	1
LER**3218W32**	●	3	18	2.000	6.750	2.000	3.500	2.500	5° 52′	2	CS350990T	①TKY10F	CCMX09T308EN○	17
											CS350990T	②TKY10D	ZCMX09T308ER○	1

★ Clamp Torque (lbf-in) : CS300890T=8.9, CS350990T=22

INSERTS

Work Material			F7030	VP15TF	UP20M
P	Steel		●	●	●
M	Stainless Steel		◔	◔	◔
K	Cast Iron			✱	
N	Non-Ferrous Metal				

Cutting Conditions :
● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting

Shape		Order Number	Class	Coated F7030	Coated VP15TF	Coated UP20M	L	W1	IC	S	RE	Geometry
Peripheral and Bottom Inserts		**CCMX083508ENA**	M	★		●	—	—	.313	.138	.031	
		CCMX**09T308ENA**	M	●	●	●	—	—	.375	.156	.031	
	Strong Cutting Edge Type 	✱ **CCMX09T308ENB**	M	★			—	—	.375	.156	.031	
Bottom Insert (One Pocket Only)		**ZCMX083508ERA**	M	★			.409	.313	—	.137	.031	
		ZCMX**09T308ERA**	M	●	●	●	.472	.375	—	.156	.031	
	Strong Cutting Edge Type 	✱ **ZCMX09T308ERB**	M	★		●	.472	.375	—	.156	.031	

★ These inserts are for slotting only when chipping occurs with standard inserts. Feed must be reduced 25%.

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

RECOMMENDED CUTTING CONDITIONS

SLOT MILLING

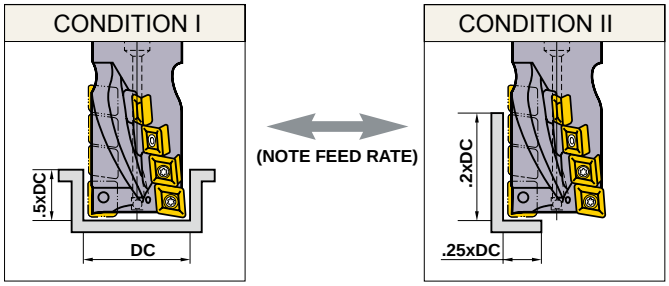
Work Material		Cutting Condition Vs.Tool Diameter					Insert grade
		Spindle Speed / Feed	ϕ1"	ϕ1.25"	ϕ1.5"	ϕ2"	
P	Mild Steel (<160HB)	min^{-1}	2250	1800	1500	1100	VP15TF
		inch/min	7—12	6—10	7—12	6—10	
	Carbon Steel (20HRC)	min^{-1}	2250	1800	1500	1100	
		inch/min	8—14	7—12	8—14	7—12	
	Alloy Steel (30HRC)	min^{-1}	1750	1800	1200	900	
		inch/min	6—10	5—8	6—10	5—8	
M	Stainless Steel (304)	min^{-1}	1900	1500	1250	950	VP15TF
		inch/min	3—5	2.5—4	3—5	2.5—4	

Warning : These feed rates are for ENA and ERA inserts.
Reduce feed 25% for ENB and ERB inserts.
Do not use ENB or ERB inserts in stainless steel, mild steel, titanium alloys and nickel base alloys.
Insert breakage will occur.

SHOULDER MILLING

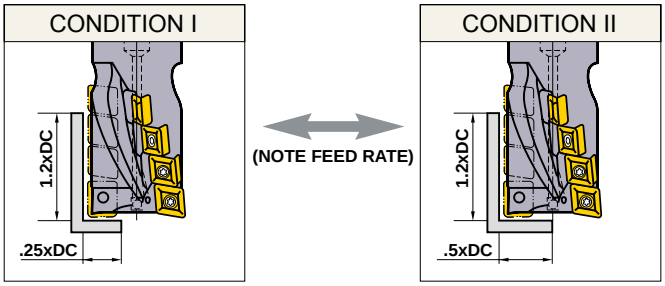
Work Material		Cutting Condition Vs.Tool Diameter					Insert grade
		Spindle Speed / Feed	ϕ1"	ϕ1.25"	ϕ1.5"	ϕ2"	
P	Mild Steel (<160HB)	min^{-1}	2250	1800	1500	1100	VP15TF
		inch/min	11—18	9—15	11—18	9—15	
	Carbon Steel (20HRC)	min^{-1}	2250	1800	1500	1100	
		inch/min	12—21	11—18	12—21	11—18	
	Alloy Steel (30HRC)	min^{-1}	1750	1400	1200	900	
		inch/min	9—15	8—12	9—15	8—12	
M	Stainless Steel (304)	min^{-1}	1900	1500	1250	950	VP15TF
		inch/min	7—12	6—10	7—12	6—10	

SLOT MILLING
FORCED AIR IS REQUIRED AT CUTTING EDGE



- Titanium alloy requires coolant (Cutting fluid).
- Use higher recommended feed rate under CONDITION I.
- Use lower recommended feed rate under CONDITION II.

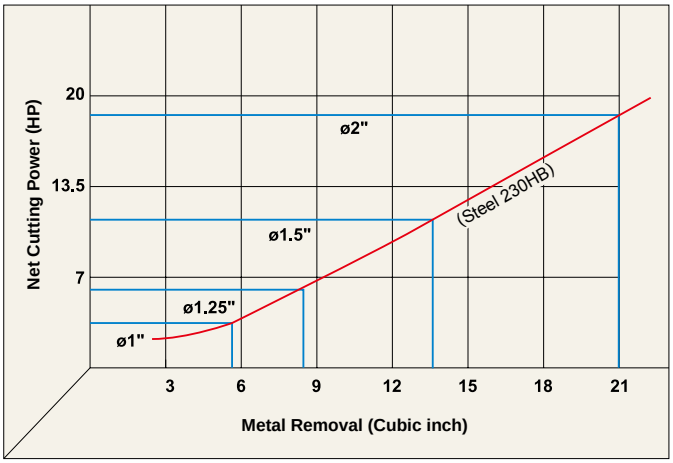
SHOULDER MILLING
GENERALLY DOWN (CLIMB) CUT IS RECOMMENDED



- Titanium alloy requires coolant (Cutting fluid).
- Use higher recommended feed rate under CONDITION I.
- Use lower recommended feed rate under CONDITION II.

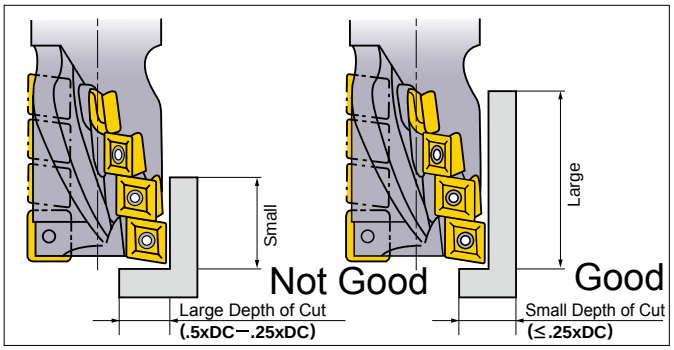
NET CUTTING POWER

- Please use the chart below for reference, please select the conditions that suits the machines power.
- Chip Discharge Q ($inch^3$/min)=Table Feed×Depth of Cut×Cutting Width÷1000



FOR USE OF LONG CUTTING LENGTH TYPE

- Since the overhang from the milling chuck is long, a large width of cut will cause chattering and tool breakage.
- Keep the width of cut small and the depth of cut in axial direction large. (See the following illustration.)
- For slot milling, keep the table feed at not more than half the value listed in the above table. (Use the standard cutting length type as much as possible.)



MILLING

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

MULTI FUNCTIONAL MILLING

Roughing

Including Flat faces

AQX

P M K N S H



- Air / coolant through.
- The center bottom cutting edge enables drilling and end milling without prepared hole.

Fig.1

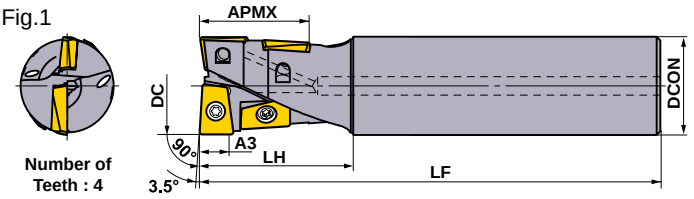


Fig.2

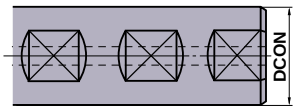
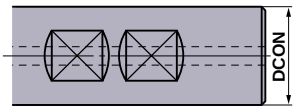


Fig.3



STANDARD EDGE TYPE

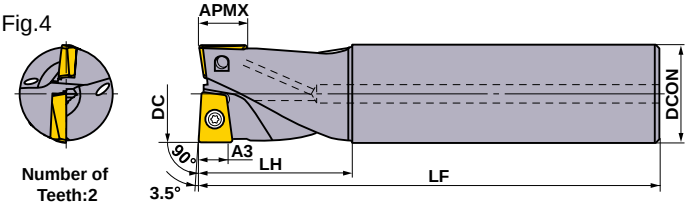
Right hand tool holder only.

Type	Order Number	Stock	Dimensions (inch)						Type (Fig.)	★3	① ②	
		R	DC	LF	DCON	LH	A3★1	APMX★2		Insert Screw	Wrench	Insert
Standard	AQXUR124WA12S	●	.750	4.125	.750	1.375	.219	.750	3	TS25	①TKY08F	QOG/MT0934R-○○
	AQXUR164WA16S	●	1.000	4.875	1.000	1.625	.281	1.000	2	TS32	②TKY08D	QOG/MT1443R-○○
	AQXUR204WA20S	●	1.250	5.250	1.250	2.000	.375	1.250	2	TS407	②TKY15D	QOG/MT1651R-○○
	AQXUR244WA20S	●	1.500	5.625	1.250	2.375	.438	1.500	2	TS5	②TKY25D	QOG/MT1959R-○○
Long	AQXUR124SA12L	●	.750	7.250	.750	2.375	.219	.750	1	TS25	①TKY08F	QOG/MT0934R-○○
	AQXUR134SA12L	●	.797	7.250	.750	1.375	.219	.750	1	TS25	①TKY08F	QOG/MT0934R-○○
	AQXUR164SA16L	●	1.000	8.500	1.000	3.000	.281	1.000	1	TS32	②TKY08D	QOG/MT1443R-○○
	AQXUR174SA16L	●	1.047	8.500	1.000	1.625	.281	1.000	1	TS32	②TKY08D	QOG/MT1443R-○○
	AQXUR204SA20L	●	1.250	9.000	1.250	3.500	.375	1.250	1	TS407	②TKY15D	QOG/MT1651R-○○
	AQXUR214SA20L	●	1.297	9.000	1.250	2.000	.375	1.250	1	TS407	②TKY15D	QOG/MT1651R-○○
	AQXUR244SA20L	●	1.500	9.500	1.250	2.375	.438	1.500	1	TS5	②TKY25D	QOG/MT1959R-○○

★3 Clamp Torque (lbf-in) : TS25=8.9, TS32=8.9, TS407=31, TS5=66



Fig.4



SHORT EDGE TYPE

Right hand tool holder only.

Type	Order Number	Stock	Dimensions (inch)						Type (Fig.)	★3	① ②	
		R	DC	LF	DCON	LH	A3★1	APMX★2		Insert Screw	Wrench	Insert
Standard	AQXUR102WA10S	●	.625	3.688	.625	1.125	.188	.281	3	TS2A	①TKY06F	QOG/MT0830R-○○
	AQXUR122WA12S	●	.750	4.125	.750	1.375	.219	.344	3	TS25	①TKY08F	QOG/MT0934R-○○
	AQXUR162WA16S	●	1.000	4.875	1.000	1.625	.281	.469	2	TS32	②TKY08D	QOG/MT1443R-○○
	AQXUR202WA20S	●	1.250	5.250	1.250	2.000	.375	.563	2	TS407	②TKY15D	QOG/MT1651R-○○
	AQXUR242WA20S	●	1.500	5.625	1.250	2.375	.438	.688	2	TS55	②TKY25D	QOG/MT1959R-○○
Long	AQXUR102SA10L	●	.625	6.875	.625	2.000	.188	.281	4	TS2A	①TKY06F	QOG/MT0830R-○○
	AQXUR112SA10L	●	.672	6.875	.625	1.125	.188	.281	4	TS2A	①TKY06F	QOG/MT0830R-○○
	AQXUR122SA12L	●	.750	7.250	.750	2.375	.219	.344	4	TS25	①TKY08F	QOG/MT0934R-○○
	AQXUR132SA12L	●	.797	7.250	.750	1.375	.219	.344	4	TS25	①TKY08F	QOG/MT0934R-○○
	AQXUR162SA16L	●	1.000	8.500	1.000	3.000	.281	.469	4	TS32	②TKY08D	QOG/MT1443R-○○
	AQXUR172SA16L	●	1.047	8.500	1.000	1.625	.281	.469	4	TS32	②TKY08D	QOG/MT1443R-○○
	AQXUR202SA20L	●	1.250	9.000	1.250	3.500	.375	.563	4	TS407	②TKY15D	QOG/MT1651R-○○
	AQXUR212SA20L	●	1.297	9.000	1.250	2.000	.375	.563	4	TS407	②TKY15D	QOG/MT1651R-○○
	AQXUR242SA20L	●	1.500	9.500	1.250	2.375	.438	.688	4	TS55	②TKY25D	QOG/MT1959R-○○

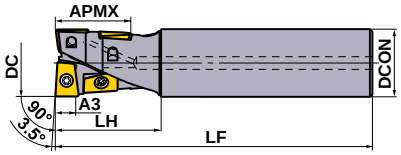
(Note) When exceeding A3 depth of cut, reduce feed rates by 50%(Do not exceed APMX depth of cut). Reference page K105.
★1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts.
★2 APMX: Maximum depth of cut.
★3 Clamp Torque (lbf-in) : TS2A=5.3, TS25=8.9, TS33=8.9, TS407=31, TS5=66

● : Inventory maintained. ★ : Inventory maintained in Japan.





Number of Teeth : 4



METRIC Standard

STANDARD EDGE TYPE

Right hand tool holder only.

Type	Order Number	Stock	Coolant Thru ★4	Dimensions (mm)						★3 Insert Screw	★3 Wrench	Insert
		R		DC	LF	DCON	LH	A3 ★1	APMX ★2			
Standard	AQXR164SA16S	★	Y	16	120	16	30	4.5	17.6	TS2A	①TKY06F	QOG/MT0830R-G1/M2
	AQXR164SN16S	★	N	16	120	16	30	4.5	17.6	TS2A	①TKY06F	
	AQXR174SA16S	★	Y	17	120	16	30	4.5	17.6	TS2A	①TKY06F	
	AQXR174SN16S	★	N	17	120	16	30	4.5	17.6	TS2A	①TKY06F	
	AQXR204SA20S	★	Y	20	130	20	35	6	22	TS25	①TKY08F	QOG/MT1035R-G1/M2
	AQXR204SN20S	★	N	20	130	20	35	6	22	TS25	①TKY08F	
	AQXR214SA20S	★	Y	21	130	20	35	6	22	TS25	①TKY08F	
	AQXR214SN20S	★	N	21	130	20	35	6	22	TS25	①TKY08F	
	AQXR254SA25S	★	Y	25	140	25	40	7.5	27.5	TS33	①TKY08D	QOG/MT1342R-G1/M2
	AQXR254SN25S	★	N	25	140	25	40	7.5	27.5	TS33	②TKY08D	
	AQXR264SA25S	★	Y	26	140	25	40	7.5	27.5	TS33	②TKY08D	
	AQXR264SN25S	★	N	26	140	25	40	7.5	27.5	TS33	②TKY08D	
	AQXR324SA32S	★	Y	32	150	32	50	9.5	35.2	TS407	②TKY15D	QOG/MT1651R-G1/M2
	AQXR324SN32S	★	N	32	150	32	50	9.5	35.2	TS407	②TKY15D	
	AQXR334SA32S	★	Y	33	150	32	50	9.5	35.2	TS407	②TKY15D	
	AQXR334SN32S	★	N	33	150	32	50	9.5	35.2	TS407	②TKY15D	
	AQXR354SA32S	★	Y	35	150	32	50	11	40	TS407	②TKY15D	QOG/MT1856R-G1/M2
	AQXR354SN32S	★	N	35	150	32	50	11	40	TS407	②TKY15D	
	AQXR404SA32S	★	Y	40	160	32	60	12	44	TS55	②TKY25D	QOG/MT2062R-G1/M2
	AQXR404SN32S	★	N	40	160	32	60	12	44	TS55	②TKY25D	
	AQXR504SA42S	★	Y	50	170	42	70	15	55	TS6S	③TKY30T	QOG/MT2576R-G1/M2
	AQXR504SN42S	★	N	50	170	42	70	15	55	TS6S	③TKY30T	
Long	AQXR164SA16L	★	Y	16	175	16	50	4.5	17.6	TS2A	①TKY06F	QOG/MT0830R-G1/M2
	AQXR164SN16L	★	N	16	175	16	50	4.5	17.6	TS2A	①TKY06F	
	AQXR174SA16L	★	Y	17	175	16	30	4.5	17.6	TS2A	①TKY06F	
	AQXR174SN16L	★	N	17	175	16	30	4.5	17.6	TS2A	①TKY06F	
	AQXR204SA20L	★	Y	20	185	20	60	6	22	TS25	①TKY08F	QOG/MT1035R-G1/M2
	AQXR204SN20L	★	N	20	185	20	60	6	22	TS25	①TKY08F	
	AQXR214SA20L	★	Y	21	185	20	35	6	22	TS25	①TKY08F	
	AQXR214SN20L	★	N	21	185	20	35	6	22	TS25	①TKY08F	
	AQXR254SA25L	★	Y	25	220	25	75	7.5	27.5	TS33	②TKY08D	QOG/MT1342R-G1/M2
	AQXR254SN25L	★	N	25	220	25	75	7.5	27.5	TS33	②TKY08D	
	AQXR264SA25L	★	Y	26	220	25	40	7.5	27.5	TS33	②TKY08D	
	AQXR264SN25L	★	N	26	220	25	40	7.5	27.5	TS33	②TKY08D	
	AQXR324SA32L	★	Y	32	230	32	90	9.5	35.2	TS407	②TKY15D	QOG/MT1651R-G1/M2
	AQXR324SN32L	★	N	32	230	32	90	9.5	35.2	TS407	②TKY15D	
	AQXR334SA32L	★	Y	33	230	32	50	9.5	35.2	TS407	②TKY15D	
	AQXR334SN32L	★	N	33	230	32	50	9.5	35.2	TS407	②TKY15D	
	AQXR354SA32L	★	Y	35	230	32	50	11	40	TS407	②TKY15D	QOG/MT1856R-G1/M2
	AQXR354SN32L	★	N	35	230	32	50	11	40	TS407	②TKY15D	
	AQXR404SA32L	★	Y	40	240	32	60	12	44	TS55	②TKY25D	QOG/MT2062R-G1/M2
	AQXR404SN32L	★	N	40	240	32	60	12	44	TS55	②TKY25D	
	AQXR504SA42L	★	Y	50	250	42	70	15	55	TS6S	③TKY30T	QOG/MT2576R-G1/M2
	AQXR504SN42L	★	N	50	250	42	70	15	55	TS6S	③TKY30T	

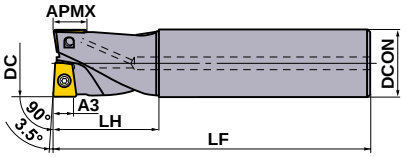
★1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts.
★2 APMX: Maximum depth of cut.
★3 Clamp Torque (lbf-in) : TS2A=5.3, TS25=8.9, TS33=8.9, TS407=31, TS55=66, TS6S=89
★4 Y=Yes, N=No

INSERTS ➤ K104
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001





Number of Teeth : 2



METRIC Standard

SHORT EDGE TYPE

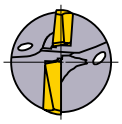
Right hand tool holder only.

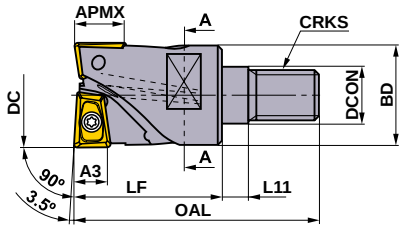
Type	Order Number	Stock R	Coolant Thru ★4	DC	LF	DCON	LH	A3 ★1	APMX ★2	Insert Screw ★3	Wrench	Insert
Standard	AQXR162SA16S	★	Y	16	120	16	30	4.5	7.4	TS2A	①TKY06F	QO○T0830R-○○
	AQXR162SN16S	★	N	16	120	16	30	4.5	7.4	TS2A	①TKY06F	
	AQXR172SA16S	★	Y	17	120	16	30	4.5	7.4	TS2A	①TKY06F	
	AQXR172SN16S	★	N	17	120	16	30	4.5	7.4	TS2A	①TKY06F	
	AQXR202SA20S	★	Y	20	130	20	35	6	9.2	TS25	①TKY08F	QO○T1035R-○○
	AQXR202SN20S	★	N	20	130	20	35	6	9.2	TS25	①TKY08F	
	AQXR212SA20S	★	Y	21	130	20	35	6	9.2	TS25	①TKY08F	
	AQXR212SN20S	★	N	21	130	20	35	6	9.2	TS25	①TKY08F	
	AQXR252SA25S	★	Y	25	140	25	40	7.5	11.5	TS33	②TKY08D	QO○T1342R-○○
	AQXR252SN25S	★	N	25	140	25	40	7.5	11.5	TS33	②TKY08D	
	AQXR262SA25S	★	Y	26	140	25	40	7.5	11.5	TS33	②TKY08D	
	AQXR262SN25S	★	N	26	140	25	40	7.5	11.5	TS33	②TKY08D	
	AQXR322SA32S	★	Y	32	150	32	50	9.5	14.5	TS407	②TKY15D	QO○T1651R-○○
	AQXR322SN32S	★	N	32	150	32	50	9.5	14.5	TS407	②TKY15D	
	AQXR332SA32S	★	Y	33	150	32	50	9.5	14.5	TS407	②TKY15D	
	AQXR332SN32S	★	N	33	150	32	50	9.5	14.5	TS407	②TKY15D	
	AQXR352SA32S	★	Y	35	150	32	50	11	16	TS407	②TKY15D	QO○T1856R-○○
	AQXR352SN32S	★	N	35	150	32	50	11	16	TS407	②TKY15D	
	AQXR402SA32S	★	Y	40	160	32	60	12	18	TS55	②TKY25D	QO○T2062R-○○
	AQXR402SN32S	★	N	40	160	32	60	12	18	TS55	②TKY25D	
	AQXR502SA42S	★	Y	50	170	42	70	15	23	TS6S	③TKY30T	QO○T2576R-○○
	AQXR502SN42S	★	N	50	170	42	70	15	23	TS6S	③TKY30T	
Long	AQXR162SA16L	★	Y	16	175	16	50	4.5	7.4	TS2A	①TKY06F	QO○T0830R-○○
	AQXR162SN16L	★	N	16	175	16	50	4.5	7.4	TS2A	①TKY06F	
	AQXR172SA16L	★	Y	17	175	16	30	4.5	7.4	TS2A	①TKY06F	
	AQXR172SN16L	★	N	17	175	16	30	4.5	7.4	TS2A	①TKY06F	
	AQXR202SA20L	★	Y	20	185	20	60	6	9.2	TS25	①TKY08F	QO○T1035R-○○
	AQXR202SN20L	★	N	20	185	20	60	6	9.2	TS25	①TKY08F	
	AQXR212SA20L	★	Y	21	185	20	35	6	9.2	TS25	①TKY08F	
	AQXR212SN20L	★	N	21	185	20	35	6	9.2	TS25	①TKY08F	
	AQXR252SA25L	★	Y	25	220	25	75	7.5	11.5	TS33	②TKY08D	QO○T1342R-○○
	AQXR252SN25L	★	N	25	220	25	75	7.5	11.5	TS33	②TKY08D	
	AQXR262SA25L	★	Y	26	220	25	40	7.5	11.5	TS33	②TKY08D	
	AQXR262SN25L	★	N	26	220	25	40	7.5	11.5	TS33	②TKY08D	
	AQXR322SA32L	★	Y	32	230	32	90	9.5	14.5	TS407	②TKY15D	QO○T1651R-○○
	AQXR322SN32L	★	N	32	230	32	90	9.5	14.5	TS407	②TKY15D	
	AQXR332SA32L	★	Y	33	230	32	50	9.5	14.5	TS407	②TKY15D	
	AQXR332SN32L	★	N	33	230	32	50	9.5	14.5	TS407	②TKY15D	
	AQXR352SA32L	★	Y	35	230	32	50	11	16	TS407	②TKY15D	QO○T1856R-○○
	AQXR352SN32L	★	N	35	230	32	50	11	16	TS407	②TKY15D	
	AQXR402SA32L	★	Y	40	240	32	60	12	18	TS55	②TKY25D	QO○T2062R-○○
	AQXR402SN32L	★	N	40	240	32	60	12	18	TS55	②TKY25D	
	AQXR502SA42L	★	Y	50	250	42	70	15	23	TS6S	③TKY30T	QO○T2576R-○○
	AQXR502SN42L	★	N	50	250	42	70	15	23	TS6S	③TKY30T	

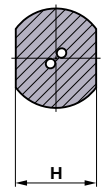
★1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts.
★2 APMX: Maximum depth of cut.
★3 Clamp Torque (lbf-in) : TS2A=5.3, TS25=8.9, TS33=8.9, TS407=31, TS55=66, TS6S=89
★4 Y=Yes, N=No

★ : Inventory maintained in Japan.









Section **A-A**

METRIC Standard

SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock	Coolant Thru ✶5	Dimensions (mm)										✶3	① ②	
	R		DC	DCON	BD	OAL	LF	L11	H	CRKS ✶4	A3 ✶1	APMX ✶2	Insert Screw	Wrench	Insert
AQXR162M08A30	★	Y	16	8.5	14.7	48	30	6	10	M8	4.5	7.4	TS2A	①TKY06F	QO○T0830R-○○
AQXR**172M08A30**	★	Y	17	8.5	14.5	48	30	6	10	M8	4.5	7.4	TS2A	①TKY06F	
AQXR**202M10A30**	★	Y	20	10.5	18.6	49	30	6	14	M10	6	9.2	TS25	①TKY08F	QO○T1035R-○○
AQXR**212M10A30**	★	Y	21	10.5	18.5	49	30	6	14	M10	6	9.2	TS25	①TKY08F	
AQXR**252M12A35**	★	Y	25	12.5	23.5	57	35	6	19	M12	7.5	11.5	TS33	②TKY08D	QO○T1342R-○○
AQXR**262M12A35**	★	Y	26	12.5	23.5	57	35	6	19	M12	7.5	11.5	TS33	②TKY08D	
AQXR**322M16A40**	★	Y	32	17	28.5	63	40	6	24	M16	9.5	14.5	TS407	②TKY15D	QO○T1651R-○○
AQXR**332M16A40**	★	Y	33	17	28.5	63	40	6	24	M16	9.5	14.5	TS407	②TKY15D	
AQXR**352M16A40**	★	Y	35	17	28.5	63	40	6	24	M16	11	16	TS407	②TKY15D	QO○T1856R-○○
AQXR**402M16A45**	★	Y	40	17	28.5	68	45	6	24	M16	12	18	TS55	②TKY25D	QO○T2062R-○○

✶1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts.
✶2 APMX: Maximum depth of cut.
✶3 Clamp Torque (lbf-in) : TS2A=5.3, TS25=8.9, TS33=8.9, TS407=31, TS55=66
✶4 Clamp Torque of the Head (lbf-ft) : M8=17.1, M10=33.8, M12=59.2, M16=66.7
✶5 Y=Yes

MILLING

SCREW-IN ARBORS ➤ K162
INSERTS ➤ K104
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS

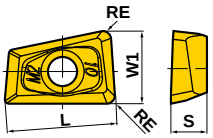
Work Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat-resistant Alloy, Titanium Alloy
	H	Hardened Materials

Cutting Conditions :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

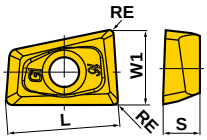
Honing :
E : Round **F** : Sharp

Shape	Order Number	End Mill Dia.	Class	Honing	Coated VP15TF	Coated VP30RT	Carbide HTi10	Dimensions (inch) L	W1	S	RE	Geometry
M breaker	**QOMT0830R-M2**	ϕ.625, .672	M	E	●	●		.350	.220	.120	.031	
	QOMT**0934R-M2**	ϕ.750, .797	M	E	●	●		.401	.264	.134	.031	
	QOMT**1443R-M2**	ϕ1.000, 1.047	M	E	●	●		.528	.350	.169	.031	
	QOMT**1651R-M2**	ϕ1.250, 1.297	M	E	●	●		.650	.433	.200	.031	
	QOMT**1959R-M2**	ϕ1.500	M	E	●	●		.768	.512	.232	.031	
G breaker	**QOGT0830R-G1**	ϕ.625, .672	G	F*	★		●	.350	.220	.120	.016	
	QOGT**0934R-G1**	ϕ.750, .797	G	F			●	.401	.264	.134	.016	
	QOGT**1443R-G1**	ϕ1.000, 1.047	G	F			●	.528	.350	.169	.016	
	QOGT**1651R-G1**	ϕ1.250, 1.297	G	F*	★		●	.650	.433	.200	.016	
	QOGT**1959R-G1**	ϕ1.500	G	F			●	.768	.512	.232	.016	









★ Grade VP15TF has “E” honing.

INSERTS For Metric Standard

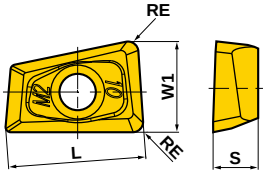
Work Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat-resistant Alloy, Titanium Alloy
	H	Hardened Materials

Cutting Conditions :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

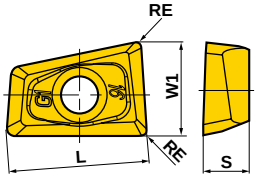
Honing :
E : Round **F** : Sharp

Shape	Order Number	End Mill Dia.	Class	Honing	Coated VP15TF	Coated VP30RT	Carbide HTi10	Dimensions (mm) L	W1	S	RE	Geometry
M breaker	**QOMT0830R-M2**	ϕ16,17	M	E	●	●		8.4	5.5	3	0.8	
	QOMT**1035R-M2**	ϕ20,21	M	E	★	★		10.6	7	3.5	0.8	
	QOMT**1342R-M2**	ϕ25,26	M	E	★	★		13.1	8.7	4.2	0.8	
	QOMT**1651R-M2**	ϕ32,33	M	E	●	●		16.5	11	5.1	0.8	
	QOMT**1856R-M2**	ϕ35	M	E	★	★		18	12	5.6	0.8	
	QOMT**2062R-M2**	ϕ40	M	E	★	★		20.4	13.6	6.2	0.8	
	QOMT**2576R-M2**	ϕ50	M	E	★	★		25.8	17.2	7.6	0.8	
G breaker	**QOGT0830R-G1**	ϕ16,17	G	F*	★		●	8.4	5.5	3	0.4	
	QOGT**1035R-G1**	ϕ20,21	G	F*	★		★	10.6	7	3.5	0.4	
	QOGT**1342R-G1**	ϕ25,26	G	F*	★		★	13.1	8.7	4.2	0.4	
	QOGT**1651R-G1**	ϕ32,33	G	F*	★		●	16.5	11	5.1	0.4	
	QOGT**1856R-G1**	ϕ35	G	F*	★		★	18	12	5.6	0.4	
	QOGT**2062R-G1**	ϕ40	G	F*	★		★	20.4	13.6	6.2	0.4	
	QOGT**2576R-G1**	ϕ50	G	F*	★		★	25.8	17.2	7.6	0.4	





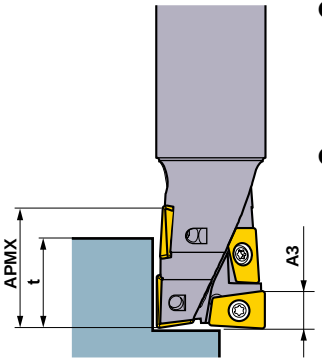




★ Grade VP15TF has “E” honing.

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

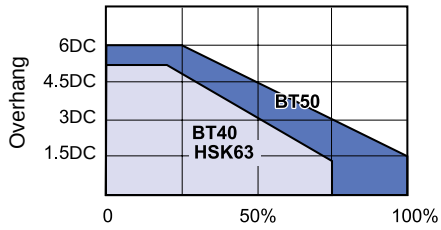
RECOMMENDED CUTTING CONDITIONS



(Note) Figures for A3 and APMX are shown in the table of holder standard.

- A3 is the depth of cut for the full dual blade portion at the end of the cutting edge.
- Beyond the range of A3 where overlapping occurs, there is an area where the cutting edge becomes single bladed, not forming full dual blade configuration. As such, please pay special attention to the relationship between depth of cut and feed.
- In general, the edge at the border of cut tends to suffer from damages. At large depth of cut operations, applying the following depth of cut (t), at which the edge is full dual bladed at the border of cut, is recommended to prevent damage to the cutting edge.

Tool diameter	Recommended depth of cut t (inch)
ϕ.625, ϕ.672	.472—.551
ϕ.750, ϕ.797	.551—.669
ϕ1.000, ϕ1.047	.669—.866
ϕ1.250, ϕ1.297	.866—1.102
ϕ1.500	1.102—1.378



(Note) DC=Cutting Edge Diameter

- Chatter vibration and other problems tend to occur at operations where overhang length is large and/or machine rigidity is low, resulting in unstable machining.
- Please reduce feed accordingly, using the above chart as a guideline.

CUTTING CONDITIONS FOR SHOULDER MILLING

Work Material		Hardness	Grade	Cutting Speed (SFM)	ϕ.625", ϕ.672" (ϕ16mm, ϕ17mm)			ϕ.750", ϕ.797" (ϕ20mm, ϕ21mm)			ϕ1.000", ϕ1.047" (ϕ25mm, ϕ26mm)			ϕ1.250", ϕ1.297" (ϕ32mm, ϕ33mm)			ϕ1.500" (ϕ40mm)		
					Depth of Cut (inch)	Width of Cut (inch)	Feed (inch/rev)	Depth of Cut (inch)	Width of Cut (inch)	Feed (inch/rev)	Depth of Cut (inch)	Width of Cut (inch)	Feed (inch/rev)	Depth of Cut (inch)	Width of Cut (inch)	Feed (inch/rev)	Depth of Cut (inch)	Width of Cut (inch)	Feed (inch/rev)
P	Mild Steel	≤180HB	VP15TF	590 (490—720)	—.177	—.315	.010	—.236	—.394	.012	— .295	—.492	.014	— .374	—.630	.016	— .472	—.787	.020
					.177—.472	—.197	.006	.236—.551	—.276	.010	.295— .669	—.315	.011	.374— .866	—.433	.013	.472—1.102	—.512	.016
					.472—.669	—.118	.004	.551—.866	—.157	.007	.669—1.063	—.197	.008	.866—1.378	—.236	.010	1.102—1.732	—.276	.012
	Carbon Steel Alloy Steel	180—350HB	VP15TF	525 (395—655)	—.177	—.315	.008	—.236	—.394	.010	— .295	—.492	.012	— .374	—.630	.014	— .472	—.787	.016
					.177—.472	—.157	.006	.236—.551	—.236	.008	.295— .669	—.276	.010	.374— .866	—.394	.011	.472—1.102	—.472	.013
					.472—.669	—.079	.003	.551—.866	—.118	.006	.669—1.063	—.157	.007	.866—1.378	—.197	.008	1.102—1.732	—.236	.010
M	Stainless Steel	≤270HB	VP30RT	490 (395—590)	—.177	—.315	.008	—.236	—.394	.010	— .295	—.492	.012	— .374	—.630	.014	— .472	—.787	.016
					.177—.472	—.157	.006	.236—.551	—.236	.008	.295— .669	—.276	.010	.374— .866	—.394	.011	.472—1.102	—.472	.013
					.472—.669	—.079	.003	.551—.866	—.118	.006	.669—1.063	—.157	.007	.866—1.378	—.197	.008	1.102—1.732	—.236	.010
K	Cast Iron	Tensile Strength ≤450MPa	VP15TF	590 (490—720)	—.177	—.315	.010	—.236	—.394	.012	— .295	—.492	.014	— .374	—.630	.016	— .472	—.787	.020
					.177—.472	—.197	.006	.236—.551	—.276	.010	.295— .669	—.315	.011	.374— .866	—.433	.013	.472—1.102	—.512	.016
					.472—.669	—.118	.004	.551—.866	—.157	.007	.669—1.063	—.197	.008	.866—1.378	—.236	.010	1.102—1.732	—.276	.012
N	Aluminum Alloy	—	HTi10 (G1 Breaker)	1640 (655—2620)	—.177	—.433	.012	—.236	—.551	.014	— .295	—.689	.016	— .374	—.906	.018	— .472	—1.102	.022
					.177—.472	—.315	.008	.236—.551	—.394	.012	.295— .669	—.492	.013	.374— .866	—.630	.015	.472—1.102	—.787	.018
					.472—.669	—.197	.006	.551—.866	—.236	.009	.669—1.063	—.295	.010	.866—1.378	—.394	.012	1.102—1.732	—.472	.014
H	Hardened Steel	45—55HRC	VP15TF	260 (160—390)	—.177	—.197	.006	—.236	—.236	.008	— .295	—.276	.009	— .374	—.315	.010	— .472	—.394	.012
					.177—.472	—.118	.004	.236—.551	—.157	.006	.295— .669	—.157	.007	.374— .866	—.197	.008	.472—1.102	—.236	.009
					.472—.669	—.039	.002	.551—.866	—.079	.005	.669—1.063	—.079	.006	.866—1.378	—.079	.006	1.102—1.732	—.079	.007

(Note 1) Please pay special attention on the depth of cut when using the short edge type.
(Note 2) When using the G1 breaker (VP15TF), please reduce the feed rate by 20%.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

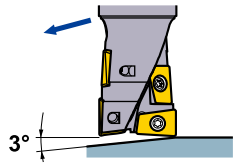
CUTTING CONDITIONS FOR SLOTTING

	Work Material	Hardness	Grade	Cutting Speed (SFM)	ϕ.625", ϕ.672" (ϕ16mm, ϕ17mm)		ϕ.750", ϕ.797" (ϕ20mm, ϕ21mm)		ϕ1.000", ϕ1.047" (ϕ25mm, ϕ26mm)		ϕ1.250", ϕ1.297" (ϕ32mm, ϕ33mm)		ϕ1.500" (ϕ40mm)	
					Depth of Cut (inch)	Feed (inch/rev)	Depth of Cut (inch)	Feed (inch/rev)	Depth of Cut (inch)	Feed (inch/rev)	Depth of Cut (inch)	Feed (inch/rev)	Depth of Cut (inch)	Feed (inch/rev)
P	Mild Steel	≤180HB	VP15TF	590 (490–720)	–.177	.006	–.236	.007	– .295	.008	– .374	.010	– .472	.012
					.177–.472	.004	.236–.551	.006	.295– .669	.006	.374– .866	.008	.472–1.102	.010
					.472–.669	.003	.551–.866	.004	.669–1.063	.005	.866–1.378	.006	1.102–1.732	.007
	Carbon Steel Alloy Steel	180–350HB	VP15TF	525 (395–655)	–.177	.006	–.236	.006	– .295	.007	– .374	.008	– .472	.010
					.177–.472	.004	.236–.551	.005	.295– .669	.006	.374– .866	.006	.472–1.102	.008
					.472–.669	.002	.551–.866	.004	.669–1.063	.004	.866–1.378	.005	1.102–1.732	.006
M	Stainless Steel	≤270HB	VP30RT	490 (395–590)	–.177	.006	–.236	.006	– .295	.007	– .374	.008	– .472	.010
					.177–.472	.004	.236–.551	.005	.295– .669	.006	.374– .866	.006	.472–1.102	.008
					.472–.669	.002	.551–.866	.004	.669–1.063	.004	.866–1.378	.005	1.102–1.732	.006
K	Cast Iron	Tensile Strength ≤450MPa	VP15TF	590 (490–720)	–.177	.006	–.236	.007	– .295	.008	– .374	.010	– .472	.012
					.177–.472	.004	.236–.551	.006	.295– .669	.006	.374– .866	.008	.472–1.102	.010
					.472–.669	.003	.551–.866	.004	.669–1.063	.005	.866–1.378	.006	1.102–1.732	.007
N	Aluminum Alloy	–	HTi10 (G1 Breaker)	1640 (655–2620)	–.177	.007	–.236	.008	– .295	.009	– .374	.011	– .472	.013
					.177–.472	.005	.236–.551	.006	.295– .669	.007	.374– .866	.009	.472–1.102	.011
					.472–.669	.004	.551–.866	.005	.669–1.063	.006	.866–1.378	.006	1.102–1.732	.008
H	Hardened Steel	45–55HRC	VP15TF	260 (160–390)	–.177	.004	–.236	.005	– .295	.006	– .374	.006	– .472	.007
					.177–.472	.003	.236–.551	.004	.295– .669	.005	.374– .866	.005	.472–1.102	.006

(Note 1) Please pay special attention on the depth of cut when using the short edge type.
(Note 2) When using the G1 breaker (VP15TF), please reduce the feed rate by 20%.

RECOMMENDED CUTTING CONDITIONS

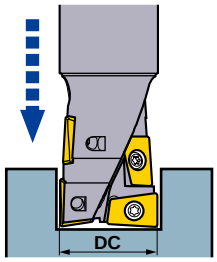
CUTTING CONDITIONS (For Ramping)



- When machining steel the recommended ramping angle is 3°. If a ramping angle larger than 3° is used, then the chips may not be broken effectively resulting in chips wrapping around the tool.
- When ramping, it is recommended to reduce the feed rate by 40%.

CUTTING CONDITIONS (For Drilling and Plunging)

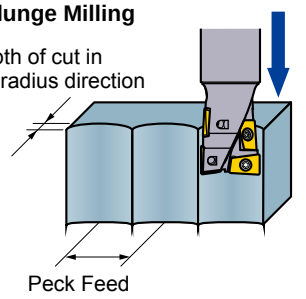
Drilling



- The recommended drilling depth is less than .5DC.
- Use step feed when drilling (.01–.02 inch) to ensure that the chips are effectively broken.
- Use internal or external cooling to ensure that the chips disposal is sufficiently achieved.
- The chips generated can discharge in any direction, so ensure that adequate safety precautions are taken.

Plunge Milling

Depth of cut in the radius direction



- The feed for plunging is the same as the feed for drilling.
- No step feed necessary.
- Please refer to the following table for the depth of cut at plunging operations.

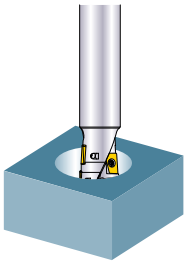
Depth of Cut in the Radius Direction	≤ .4DC
Peck Feed	≤ .5DC

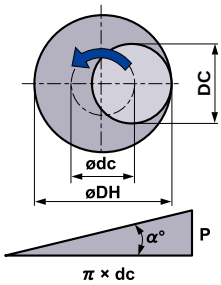
	Work Material	Hardness	Grade	Cutting Speed (SFM)	ϕ.625", ϕ.672" (ϕ16mm, ϕ17mm)		ϕ.750", ϕ.797" (ϕ20mm, ϕ21mm)		ϕ1.000", ϕ1.047" (ϕ25mm, ϕ26mm)		ϕ1.250", ϕ1.297" (ϕ32mm, ϕ33mm)		ϕ1.500" (ϕ40mm)	
					Feed (inch/rev)	Step (inch)	Feed (inch/rev)	Step (inch)	Feed (inch/rev)	Step (inch)	Feed (inch/rev)	Step (inch)	Feed (inch/rev)	Step (inch)
P	Mild Steel	≤180HB	VP15TF	590 (490–720)	.001–.003	.008	.002	.012	.002	.012	.002	.012	.002	.012
	Carbon Steel Alloy Steel	180–350HB	VP15TF	525 (395–655)	.001–.003	.008	.002	.012	.002	.012	.002	.012	.002	.012
M	Stainless Steel	≤270HB	VP30RT	490 (395–590)	.001–.003	.006	.002	.010	.002	.010	.002	.010	.002	.010
K	Cast Iron	Tensile Strength ≤450MPa	VP15TF	590 (490–720)	.002–.004	.016	.002	.020	.002	.020	.003	.020	.003	.020
N	Aluminum Alloy	–	HTi10 (G1 Breaker)	1640 (655–2620)	.002–.004	.008	.002	.012	.002	.012	.003	.012	.003	.012
H	Hardened Steel	45–55HRC	VP15TF	260 (160–390)	.001–.003	.006	.001	.010	.001	.010	.002	.010	.002	.010

(Note 1) Helical grooving is strongly recommended for machining of tempered steel.
(Note 2) When using the G1 breaker (VP15TF), please reduce the feed rate by 20%.

RECOMMENDED CUTTING CONDITIONS

CUTTING CONDITIONS (Helical Cutting)





● How to calculate the theoretical center of the tool path.

$$Ø\,dc = Ø\,DH - DC$$

Theoretical center of the tool — Desired hole diameter — Cutting edge diameter

● Depth of cut for a pass.

$$P = \pi \times dc \times \tan\alpha°$$

(Note) $\alpha° \leq 3°$

● Min. machined hole diameter at helical cutting : 1.2DC
Max. machined hole diameter at helical cutting : 1.8DC

● For chip discharge, please always apply air blow.
(When aluminum cutting, please use coolant.)

● When helical cutting, it is recommended to reduce the feed rate by 40%.

● When using the G1 breaker (VP15TF), please reduce the feed rate by 20%.

	Work Material	Hardness	Grade	Cutting Speed (SFM)	ϕ.625", ϕ.672" (ϕ16mm, ϕ17mm)				ϕ.750", ϕ.797" (ϕ20mm, ϕ21mm)				ϕ1.000", ϕ1.047" (ϕ25mm, ϕ26mm)			
					Machining Diameter (inch)	Max. Depth of Cut (inch)	Feed (inch/rev)	DOC/pass (inch/pass)	Machining Diameter (inch)	Max. Depth of Cut (inch)	Feed (inch/rev)	DOC/pass (inch/pass)	Machining Diameter (inch)	Max. Depth of Cut (inch)	Feed (inch/rev)	DOC/pass (inch/pass)
P	Mild Steel	≤180HB	VP15TF	590 (490–720)	.787	.315	.006	.017	.945	.394	.007	.017	1.181	.492	.008	.022
					.984	.472	.006	.039	1.181	.591	.006	.043	1.496	.748	.007	.056
					1.142	.630	.005	.056	1.417	.787	.006	.069	1.772	.984	.006	.087
	Carbon Steel Alloy Steel	180–350HB	VP15TF	525 (395–655)	.787	.315	.006	.013	.945	.394	.006	.013	1.181	.492	.007	.016
					.984	.472	.005	.029	1.181	.591	.006	.032	1.496	.748	.006	.042
					1.142	.630	.004	.042	1.417	.787	.005	.052	1.772	.984	.006	.065
M	Stainless Steel	≤270HB	VP30RT	490 (395–590)	.787	.118	.006	.009	.945	.157	.006	.009	1.181	.197	.007	.011
					.984	.197	.005	.019	1.181	.276	.006	.022	1.496	.354	.006	.028
					1.142	.315	.004	.028	1.417	.394	.005	.035	1.772	.492	.006	.043
K	Cast Iron	Tensile Strength ≤450MPa	VP15TF	590 (490–720)	.787	.394	.006	.022	.945	.551	.007	.022	1.181	.709	.008	.027
					.984	.512	.006	.048	1.181	.669	.006	.054	1.496	.827	.007	.070
					1.142	.630	.005	.070	1.417	.787	.006	.086	1.772	.984	.006	.108
N	Aluminum Alloy	–	HTi10 (G1 Breaker)	1640 (655–2620)	.787	.394	.007	.017	.945	.551	.008	.017	1.181	.709	.009	.022
					.984	.512	.006	.039	1.181	.669	.007	.043	1.496	.827	.008	.056
					1.142	.630	.006	.056	1.417	.787	.006	.069	1.772	.984	.007	.087
H	Hardened Steel	45–55HRC	VP15TF	260 (160–390)	.787	.118	.004	.009	.945	.157	.005	.009	1.181	.197	.006	.011
					.984	.197	.003	.019	1.181	.276	.004	.022	1.496	.354	.005	.028
					1.142	.315	.002	.028	1.417	.394	.003	.035	1.772	.492	.004	.043

	Work Material	Hardness	Grade	Cutting Speed (SFM)	ϕ1.250", ϕ1.297" (ϕ32mm, ϕ33mm)				ϕ1.500" (ϕ40mm)			
					Machining Diameter (inch)	Max. Depth of Cut (inch)	Feed (inch/rev)	DOC/pass (inch/pass)	Machining Diameter (inch)	Max. Depth of Cut (inch)	Feed (inch/rev)	DOC/pass (inch/pass)
P	Mild Steel	≤180HB	VP15TF	590 (490–720)	1.496	.630	.010	.026	1.890	.787	.012	.035
					1.890	.945	.009	.069	2.362	1.181	.010	.086
					2.283	1.260	.008	.112	2.835	1.575	.009	.138
	Carbon Steel Alloy Steel	180–350HB	VP15TF	525 (395–655)	1.496	.630	.008	.019	1.890	.787	.010	.026
					1.890	.945	.007	.052	2.362	1.181	.009	.065
					2.283	1.260	.006	.084	2.835	1.575	.008	.104
M	Stainless Steel	≤270HB	VP30RT	490 (395–590)	1.496	.236	.008	.013	1.890	.315	.010	.017
					1.890	.433	.007	.035	2.362	.551	.009	.043
					2.283	.630	.006	.056	2.835	.787	.008	.069
K	Cast Iron	Tensile Strength ≤450MPa	VP15TF	590 (490–720)	1.496	.866	.010	.032	1.890	1.102	.012	.043
					1.890	1.063	.009	.086	2.362	1.339	.010	.108
					2.283	1.260	.008	.141	2.835	1.575	.009	.173
N	Aluminum Alloy	–	HTi10 (G1 Breaker)	1640 (655–2620)	1.496	.866	.011	.026	1.890	1.102	.013	.035
					1.890	1.063	.009	.069	2.362	1.339	.011	.086
					2.283	1.260	.009	.112	2.835	1.575	.009	.138
H	Hardened Steel	45–55HRC	VP15TF	260 (160–390)	1.496	.236	.006	.013	1.890	.315	.007	.017
					1.890	.433	.006	.035	2.362	.551	.006	.043
					2.283	.630	.005	.056	2.835	.787	.006	.069

MULTI FUNCTIONAL MILLING

Roughing

Including Flat faces

AJX

P M K N S H



- 13°,15° positive insert.
- Air / coolant through.
- High rigidity due to double clamp structure.
- Suitable for high feed cutting.
- Special insert design with the use of 3 cutting edges.

Fig.1 **"FA" flat shank**

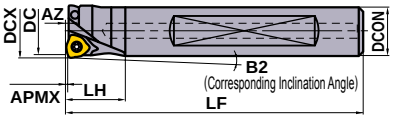


Fig.2

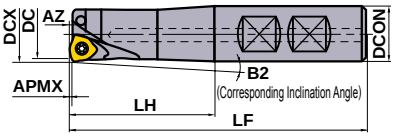


Fig.3

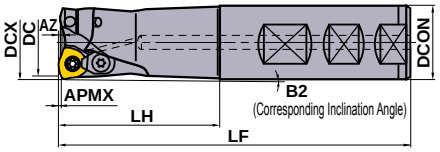
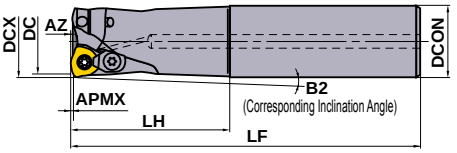


Fig.4



SHANK TYPE

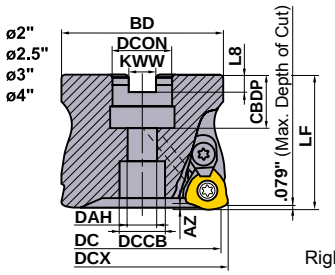
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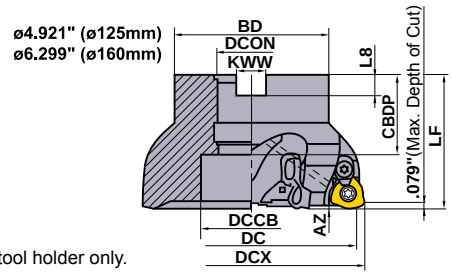
Type	Order Number	Stock	Number of Teeth	Dimensions (inch)								Type (Fig.)	Insert Screw *	Clamp Bridge	Clamp Bridge Screw *	Spring	Wrench	Insert
		R		DCX	DCON	DC	LF	LH	APMX	AZ	B2							
Standard	**AJXU06R102FA10S**	●	2	.625	.625	.346	3.750	1.250	.039	.012	2.12°	1	TS25	–	–	–	①TKY08F	JOM□06T215 ZZSR-□□
	AJXU**06R112FA10S**	●	2	.688	.625	.409	3.750	.750	.039	.012	–	1	TS25	–	–	–	①TKY08F	
	AJXU08R122WA12S	●	2	.750	.750	.417	4.750	2.000	.059	.020	1.31°	2	TS33	–	–	–	②TKY08D	JOM□080320 ZZSR-□□
	AJXU**08R142FA12S**	●	2	.875	.750	.535	4.750	1.250	.059	.020	–	1	TS33	–	–	–	②TKY08D	
	AJXU09R162WA16S	●	2	1.000	1.000	.602	5.625	2.375	.079	.039	1.1°	3	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	JDM□09T3□□ ZD□R-□□
	AJXU**09R182FA16S**	●	2	1.125	1.000	.728	5.625	1.625	.079	.039	–	1	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	AJXU12R202WA20S	●	2	1.250	1.250	.789	6.000	2.750	.079	.059	0.94°	3	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	JDM□1204□□ ZD□R-□□
	AJXU**12R243WA20S**	●	3	1.500	1.250	1.038	6.000	2.000	.079	.059	–	3	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	AJXU14R323WA24S	●	3	2.000	1.500	1.534	6.000	2.000	.079	.079	–	3	TS54	AMS5	AJS5014T25	ASS3	②TKY25D	JDM□1405□□ ZD□R-□□
Long	**AJXU06R102SA10M**	●	2	.625	.625	.346	5.750	1.500	.039	.012	1.75°	4	TS25	–	–	–	①TKY08F	JOM□06T215 ZZSR-□□
	AJXU**06R102SA10L**	●	2	.625	.625	.346	5.750	2.750	.039	.012	0.93°	4	TS25	–	–	–	①TKY08F	
	AJXU**06R112SA10L**	●	2	.688	.625	.409	5.750	.750	.039	.012	–	4	TS25	–	–	–	①TKY08F	
	AJXU**06R123SA12M**	●	3	.750	.750	.472	7.000	2.375	.039	.012	1.11°	4	TS25	–	–	–	①TKY08F	
	AJXU08R122SA12L	●	2	.750	.750	.417	7.000	4.000	.059	.020	0.64°	4	TS33	–	–	–	②TKY08D	JOM□080320 ZZSR-□□
	AJXU**08R142SA12L**	●	2	.875	.750	.535	7.000	1.250	.059	.020	–	4	TS33	–	–	–	②TKY08D	
	AJXU**08R163SA16M**	●	3	1.000	1.000	.661	8.000	2.750	.059	.020	0.94°	4	TS33	–	–	–	②TKY08D	
	AJXU09R162SA16L	●	2	1.000	1.000	.602	8.000	4.750	.079	.039	0.54°	4	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	JDM□09T3□□ ZD□R-□□
	AJXU**09R182SA16L**	●	2	1.125	1.000	.728	8.000	1.625	.079	.039	–	4	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	AJXU**09R203SA20M**	●	3	1.250	1.250	.854	8.000	3.125	.079	.039	0.82°	4	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	AJXU**09R244SA20M**	●	4	1.500	1.250	1.114	10.000	2.375	.079	.039	–	4	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	AJXU12R202SA20L	●	2	1.250	1.250	.789	8.000	4.750	.079	.059	0.54°	4	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	JDM□1204□□ ZD□R-□□
	AJXU**12R243SA20L**	●	3	1.500	1.250	1.038	10.000	2.000	.079	.059	–	4	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	AJXU**12R243SA24L**	●	3	1.500	1.500	1.038	10.000	2.750	.079	.059	0.94°	4	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	

* Clamp Torque (lbf-in) : TS25=8.9, TS33=8.9, TS351=22, TS43=31, TS54=66, AJS3010T10=22, AJS4012T15=31, AJS5014T25=66

● : Inventory maintained.

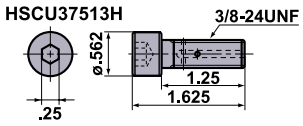


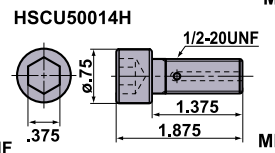


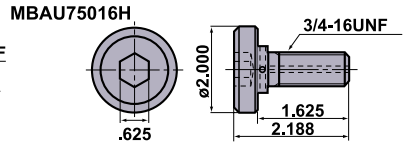


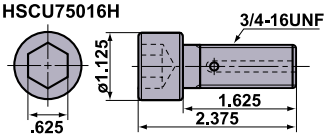
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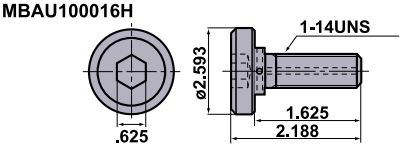
Coolant thru Set Bolt











AJX09 KAPR :+8° GAMF :-6°

AJX12 KAPR :+8° GAMF :-5°– -4°

AJX14 KAPR :+8° GAMF :-3°

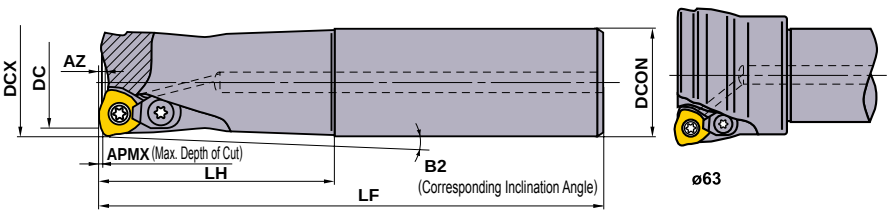
ARBOR TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (inch)											*1		*1		①②		
		R		DCX	DC	LF	DCON	CBDP	DAH	BD	KWW	L8	DCCB	AZ	Insert Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench	Coolant thru Set Bolt	Insert
Coarse Pitch	**AJXU12R0203**	●	3	2.000	1.539	2.000	.750	.748	.415	1.875	.313	.187	.600	.059	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSCU 37513H	JDM 1204 ZD R-
	AJXU14R2503C	●	3	2.500	2.032	2.000	1.000	1.024	.539	2.375	.375	.219	.787	.079	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	HSCU 50014H	JDM 1405 ZD R-
	AJXU14R0304C	●	4	3.000	2.532	2.000	1.000	1.024	.539	2.750	.375	.219	.787	.079							
	AJXU14R0405E	●	5	4.000	3.531	2.500	1.500	1.181	.787	3.750	.625	.375	1.181	.079						HSCU 75016H	
	AJX14RA12505E	●	5	4.921	4.457	2.480	1.500	1.575	2.205	3.937	.625	.375	–	.079						MBAU 75016H	
	AJX14RA16006F	●	6	6.299	5.835	2.480	2.000	1.693	2.835	3.937	.750	.437	–	.079						MBAU 100016H	
Fine Pitch	**AJXU12R0204**	●	4	2.000	1.539	2.000	.750	.748	.415	1.875	.313	.187	.600	.059	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSCU 37513H	JDM 1204 ZD R-
	AJXU14R2504C	●	4	2.500	2.032	2.000	1.000	1.024	.539	2.375	.375	.219	.787	.079	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	HSCU 50014H	JDM 1405 ZD R-
	AJXU14R0305C	●	5	3.000	2.532	2.000	1.000	1.024	.539	2.750	.375	.219	.787	.079							
	AJXU14R0406E	●	6	4.000	3.531	2.500	1.500	1.181	.787	3.750	.625	.375	1.181	.079						HSCU 75016H	
	AJX14RA12507E	●	7	4.921	4.457	2.480	1.500	1.575	2.205	3.937	.625	.375	–	.079						MBAU 75016H	
	AJX14RA16008F	●	8	6.299	5.835	2.480	2.000	1.693	2.835	3.937	.750	.437	–	.079						MBAU 100016H	
Extra Fine Pitch	**AJXU09R0205**	●	5	2.000	1.606	2.000	.750	.748	.415	1.875	.313	.187	.600	.039	TS351	AMS3	AJS3010 T10	ASS2	②TKY10D	HSCU 37513H	JDM 09T3 ZD R-
	AJXU12R2505C	●	5	2.500	2.039	2.000	1.000	1.024	.539	2.375	.375	.219	.787	.059	TS43	AMS4	AJS4012 T15		①TKY15T	HSCU 50014H	JDM 1204 ZD R-
	AJXU12R0306C	●	6	3.000	2.543	2.000	1.000	1.024	.539	2.750	.375	.219	.787	.059							
	AJXU12R0407E	●	7	4.000	3.539	2.500	1.500	1.181	.787	3.750	.625	.375	1.181	.059						HSCU 75016H	

*1 Clamp Torque (lbf-in) : TS351=22, TS43=31, TS54=66, AJS3010T10=22, AJS4012T15=31, AJS5014T25=66
*2 The cutter body includes a set bolt for an arbor.

INSERTS ➤ K115
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001





METRIC Standard

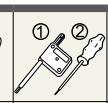
SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)								Insert Screw *	Clamp Bridge	Clamp Bridge Screw *	Spring	Wrench	Insert
		R		DCX	DCON	DC	LF	LH	APMX	AZ	B2						
Short	AJX06R162SA16SS	★	2	16	16	8.9	70	20	1.0	0.3	3°30′	TS25	—	—	—	①TKY08F	JOM○06T215 ZZSR-○○
	AJX06R172SA16SS	★	2	17	16	9.9	70	20	1.0	0.3	—	TS25	—	—	—	①TKY08F	
Standard	AJX06R162SA16S	★	2	16	16	8.9	110	30	1.0	0.3	2°15′	TS25	—	—	—	①TKY08F	JOM○ 06T215 ZZSR-○○
	AJX06R172SA16S	★	2	17	16	9.9	110	20	1.0	0.3	—	TS25	—	—	—	①TKY08F	
	AJX06R203SA20S	★	3	20	20	12.9	130	50	1.0	0.3	1°18′	TS25	—	—	—	①TKY08F	
	AJX06R223SA20S	★	3	22	20	14.9	130	30	1.0	0.3	—	TS25	—	—	—	①TKY08F	
	AJX08R202SA20S	★	2	20	20	11.4	130	50	1.5	0.5	1°18′	TS33	—	—	—	②TKY08D	JOM○ 080320 ZZSR-○○
	AJX08R222SA20S	★	2	22	20	13.4	130	30	1.5	0.5	—	TS33	—	—	—	②TKY08D	
	AJX08R253SA25S	★	3	25	25	16.4	140	60	1.5	0.5	1°06′	TS33	—	—	—	②TKY08D	
	AJX08R283SA25S	★	3	28	25	19.4	140	40	1.5	0.5	—	TS33	—	—	—	②TKY08D	
	AJX09R252SA25S	★	2	25	25	14.9	140	60	2.0	1.0	1°06′	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	JDM○ 09T3○○ ZD○R-○○
	AJX09R282SA25S	★	2	28	25	17.9	140	40	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	AJX09R303SA32S	★	3	30	32	20.0	150	70	2.0	1.0	1°48′	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	AJX09R323SA32S	★	3	32	32	21.9	150	70	2.0	1.0	0°56′	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	AJX09R353SA32S	★	3	35	32	24.9	150	50	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	AJX09R404SA32S	★	4	40	32	29.9	150	50	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	AJX09R404SA42S	★	4	40	42	29.9	150	70	2.0	1.0	1°48′	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	AJX12R302SA32S	★	2	30	32	18.3	150	70	2.0	1.5	1°48′	TS407	AMS4	AJS4012T15	ASS2	②TKY15D	JDM○ 1204○○ ZD○R-○○
	AJX12R322SA32S	★	2	32	32	20.3	150	70	2.0	1.5	0°58′	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	AJX12R352SA32S	★	2	35	32	23.3	150	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	AJX12R403SA32S	★	3	40	32	28.3	150	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	AJX12R403SA42S	★	3	40	42	28.3	150	70	2.0	1.5	1°48′	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	AJX14R503SA42S	★	3	50	42	38.2	150	50	2.0	2.0	—	TS54	AMS5	AJS5014T25	ASS3	②TKY25D	JDM○1405○○ ZD○R-○○
	AJX14R634SA42S	★	4	63	42	51.1	150	50	2.0	2.0	—	TS54	AMS5	AJS5014T25	ASS3	②TKY25D	

★ Clamp Torque (lbf-in) : TS25=8.9, TS33=8.9, TS351=22, TS407=31, TS43=31, TS54=66

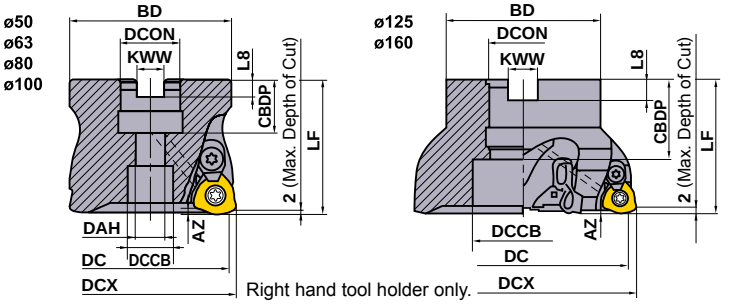
★ : Inventory maintained in Japan.

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)													
		R		DCX	DCON	DC	LF	LH	APMX	AZ	B2	Insert Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench	Insert
Long	**AJX06R162SA16L**	★	2	16	16	8.9	150	70	1.0	0.3	0°56′	TS25	—	—	—	①TKY08F	JOM○ 06T215 ZZSR-○○
	AJX06R**172SA16L**	★	2	17	16	9.9	150	20	1.0	0.3	—	TS25	—	—	—	①TKY08F	
	AJX06R**203SA20L**	★	3	20	20	12.9	180	100	1.0	0.3	0°38′	TS25	—	—	—	①TKY08F	
	AJX06R**223SA20L**	★	3	22	20	14.9	180	30	1.0	0.3	—	TS25	—	—	—	①TKY08F	
	AJX08R202SA20L	★	2	20	20	11.4	180	100	1.5	0.5	0°39′	TS33	—	—	—	②TKY08D	JOM○ 080320 ZZSR-○○
	AJX08R**222SA20L**	★	2	22	20	13.4	180	30	1.5	0.5	—	TS33	—	—	—	②TKY08D	
	AJX08R**253SA25L**	★	3	25	25	16.4	200	120	1.5	0.5	0°32′	TS33	—	—	—	②TKY08D	
	AJX08R**283SA25L**	★	3	28	25	19.4	200	40	1.5	0.5	—	TS33	—	—	—	②TKY08D	
	AJX09R252SA25L	★	2	25	25	14.9	200	120	2.0	1.0	0°32′	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	JDM○ 09T3○○ ZD○R-○○
	AJX09R**282SA25L**	★	2	28	25	17.9	200	40	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	AJX09R**303SA32L**	★	3	30	32	20.0	200	120	2.0	1.0	1°02′	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	AJX09R**323SA32L**	★	3	32	32	21.9	200	120	2.0	1.0	0°32′	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	AJX09R**353SA32L**	★	3	35	32	24.9	200	50	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	AJX09R**404SA32L**	★	4	40	32	29.9	250	50	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	AJX09R**404SA42L**	★	4	40	42	29.9	250	70	2.0	1.0	1°48′	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	AJX12R302SA32L	★	2	30	32	18.3	200	120	2.0	1.5	1°02′	TS407	AMS4	AJS4012T15	ASS2	②TKY15D	JDM○ 1204○○ ZD○R-○○
	AJX12R**322SA32L**	★	2	32	32	20.3	200	120	2.0	1.5	0°33′	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	AJX12R**352SA32L**	★	2	35	32	23.3	200	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	AJX12R**403SA32L**	★	3	40	32	28.3	250	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	AJX12R**403SA42L**	★	3	40	42	28.3	250	70	2.0	1.5	1°48′	TS43	AMS4	AJS4012T15	ASS2	②TKY25D	
	AJX14R503SA42L	★	3	50	42	38.1	250	50	2.0	2.0	—	TS54	AMS5	AJS5014T25	ASS3	②TKY25D	JDM○ 1405○○ ZD○R-○○
	AJX14R**634SA42L**	★	4	63	42	51.1	250	50	2.0	2.0	—	TS54	AMS5	AJS5014T25	ASS3	②TKY25D	
Extra Long	**AJX06R162SA16EL**	★	2	16	16	8.9	200	100	1.0	0.3	0°38′	TS25	—	—	—	①TKY08F	JOM○ 06T215 ZZSR-○○
	AJX06R**172SA16EL**	★	2	17	16	9.9	200	20	1.0	0.3	—	TS25	—	—	—	②TKY08F	
	AJX08R202SA20EL	★	2	20	20	11.4	250	130	1.5	0.5	0°30′	TS33	—	—	—	②TKY08D	JOM○ 080320 ZZSR-○○
	AJX08R**222SA20EL**	★	2	22	20	13.4	250	30	1.5	0.5	—	TS33	—	—	—	②TKY10D	
	AJX09R252SA25EL	★	2	25	25	14.9	300	180	2.0	1.0	0°22′	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	JDM○ 09T3○○ ZD○R-○○
	AJX09R**282SA25EL**	★	2	28	25	17.9	300	40	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	②TKY15D	
	AJX12R302SA32EL	★	2	30	32	18.3	300	180	2.0	1.5	0°42′	TS407	AMS4	AJS4012T15	ASS2	②TKY15D	JDM○ 1204○○ ZD○R-○○
	AJX12R**322SA32EL**	★	2	32	32	20.3	300	180	2.0	1.5	0°22′	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	AJX12R**352SA32EL**	★	2	35	32	23.3	300	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	AJX12R**402SA32EL**	★	2	40	32	28.3	350	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	AJX12R**402SA42EL**	★	2	40	42	28.3	350	70	2.0	1.5	1°48′	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	

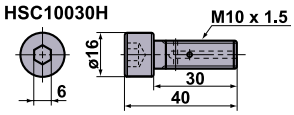
★ Clamp Torque (lbf-in) : TS25=8.9, TS33=8.9, TS351=22, TS407=31, TS43=31, TS54=66

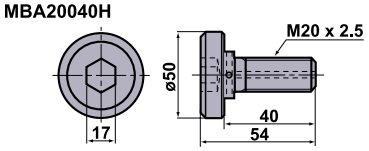
INSERTS ➤ K115
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

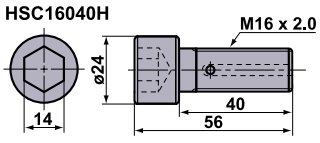


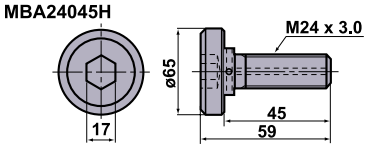


Coolant thru Set Bolt









METRIC Standard

For inch arbors

AJX09 KAPR :+8° GAMF :-6°
AJX12 KAPR :+8° GAMF :-5°– -4°
AJX14 KAPR :+8° GAMF :-3°

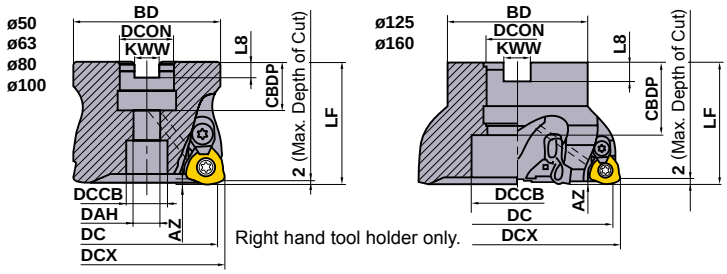
ARBOR TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (mm) [inch]											★2 WT	★1		★1				
		R		DCX	DC	LF	DCON	CBDP	DAH	BD	KWW	L8	DCCB	AZ	(kg)	Insert Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench	Set Bolt	Insert
Coarse Pitch	**AJX12R05003B**	★	3	50	38.3	50	22.225 [.875"]	19	11	47	8.4	5	17	1.5	0.4	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSC100 30H	JDM□1204□□ ZD□R-□□
	AJX14R06303B	★	3	63	51.1	50	22.225 [.875"]	19	11	60	8.4	5	17	2	0.7	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	HSC100 30H	JDM□ 1405□□ ZD□R-□□
	AJX14**R08004D**	★	4	80	68.1	63	31.75 [1.25"]	32	17	76	12.7	8	26	2	1.3						HSC160 40H	
	AJX14**R10005D**	★	5	100	88.1	63	31.75 [1.25"]	32	17	96	12.7	8	26	2	2.4							
	AJX14**R12505E**	★	5	125	113.2	63	38.1 [1.5"]	40	–	100	15.9	10	56	2	3.3						MBA200 40H	
	AJX14**R16006F**	★	6	160	148.2	63	50.8 [2.0"]	43	–	100	19.1	11	72	2	5.0						MBA240 45H	
Fine Pitch	**AJX12R05004B**	★	4	50	38.3	50	22.225 [.875"]	19	11	47	8.4	5	17	1.5	0.4	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSC100 30H	JDM□1204□□ ZD□R-□□
	AJX14R06304B	★	4	63	51.1	50	22.225 [.875"]	19	11	60	8.4	5	17	2	0.7	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	HSC100 30H	JDM□ 1405□□ ZD□R-□□
	AJX14**R08005D**	★	5	80	68.1	63	31.75 [1.25"]	32	17	76	12.7	8	26	2	1.3						HSC160 40H	
	AJX14**R10006D**	★	6	100	88.1	63	31.75 [1.25"]	32	17	96	12.7	8	26	2	2.4							
	AJX14**R12507E**	★	7	125	113.2	63	38.1 [1.5"]	40	–	100	15.9	10	56	2	3.3						MBA200 40H	
	AJX14**R16008F**	★	8	160	148.2	63	50.8 [2.0"]	43	–	100	19.1	11	72	2	5.0						MBA240 45H	
Extra Fine Pitch	**AJX09R05005B**	★	5	50	40	50	22.225 [.875"]	19	11	47	8.4	5	17	1	0.5	TS351	AMS3	AJS30 10T10	ASS2	②TKY10D	HSC100 30H	JDM□09T3□□ ZD□R-□□
	AJX12R06305B	★	5	63	51.3	50	22.225 [.875"]	19	11	60	8.4	5	17	1.5	0.9	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSC100 30H	JDM□ 1204□□ ZD□R-□□
	AJX12**R08006D**	★	6	80	68.3	63	31.75 [1.25"]	32	17	76	12.7	8	26	1.5	1.7						HSC160 40H	
	AJX12**R10007D**	★	7	100	88.3	63	31.75 [1.25"]	32	17	96	12.7	8	26	1.5	2.9							

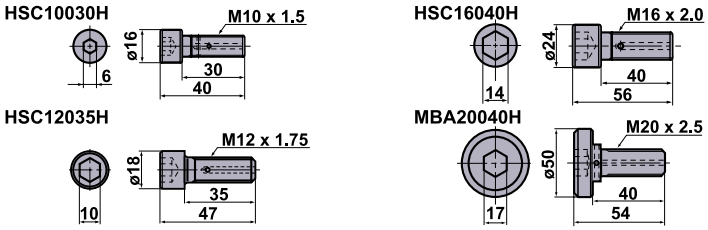
★1 Clamp Torque (lbf-in) : TS351=22, TS43=31, TS54=66, AJS3010T10=22, AJS4012T15=31, AJS5014T25=66
★2 WT : Mass
★3 Set bolt not included.

★ : Inventory maintained in Japan.





Coolant thru Set Bolt



METRIC Standard

For metric arbors

AJX09 KAPR :+8° GAMF :-6°
AJX12 KAPR :+8° GAMF :-5°─ -4°
AJX14 KAPR :+8° GAMF :-3°

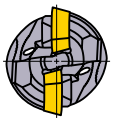
ARBOR TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)											✶2 WT	✶1 Insert Screw	Clamp Bridge	✶1 Clamp Bridge Screw	Spring	Wrench	Set Bolt	Insert
		R		DCX	DC	LF	DCON	CBDP	DAH	BD	KWW	L8	DCCB	AZ	(kg)							
Coarse Pitch	**AJX12-050A03R**	★	3	50	38.3	50	22	20	11	47	10.4	6.3	17	1.5	0.4	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSC100 30H	JDM◯1204◯◯ ZD◯R-◯◯
	AJX14-063A03R	★	3	63	51.1	50	22	20	11	60	10.4	6.3	17	2	0.7	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	HSC100 30H	JDM◯ 1405◯◯ ZD◯R-◯◯
	AJX14-080A04R	★	4	80	68.1	50	27	23	13	76	12.4	7	19	2	1.2						HSC120 35H	
	AJX14-100A05R	★	5	100	88.1	63	32	26	17	96	14.4	8	26	2	2.4						HSC160 40H	
	AJX14-125B05R	★	5	125	113.2	63	40	40	—	100	16.4	9	56	2	3.3						MBA200 40H	
	AJX14-160B06R	★	6	160	148.2	63	40	40	—	100	16.4	9	56	2	5.0							
Fine Pitch	**AJX09-050A05R**	★	5	50	40	50	22	20	11	47	10.4	6.3	17	1	0.4	TS351	AMS3	AJS30 10T10	ASS2	②TKY10D	HSC100 30H	JDM◯09T3◯◯ ZD◯R-◯◯
	AJX12-050A04R	★	4	50	38.3	50	22	20	11	47	10.4	6.3	17	1.5	0.4	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSC100 30H	JDM◯ 1204◯◯ ZD◯R-◯◯
	AJX12-063A05R	★	5	63	51.3	50	22	20	11	60	10.4	6.3	17	1.5	0.7							
	AJX12-080A06R	★	6	80	68.3	50	27	23	13	76	12.4	7	19	1.5	1.2						HSC120 35H	
	AJX12-100A07R	★	7	100	88.3	63	32	26	17	96	14.4	8	26	1.5	2.6						HSC160 40H	
	AJX14-063A04R	★	4	63	51.1	50	22	20	11	60	10.4	6.3	17	2	0.7	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	HSC100 30H	JDM◯ 1405◯◯ ZD◯R-◯◯
	AJX14-080A05R	★	5	80	68.1	50	27	23	13	76	12.4	7	19	2	1.2						HSC120 35H	
	AJX14-100A06R	★	6	100	88.1	63	32	26	17	96	14.4	8	26	2	2.4						HSC160 40H	
	AJX14-125B07R	★	7	125	113.2	63	40	40	—	100	16.4	9	56	2	3.3						MBA200 40H	
	AJX14-160B08R	★	8	160	148.2	63	40	40	—	100	16.4	9	56	2	5.0							

✶1 Clamp Torque (lbf-in) : TS351=22, TS43=31, TS54=66, AJS3010T10=22, AJS4012T15=31, AJS5014T25=66
✶2 WT : Mass
✶3 Set bolt not included.

INSERTS ➤ K115
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001





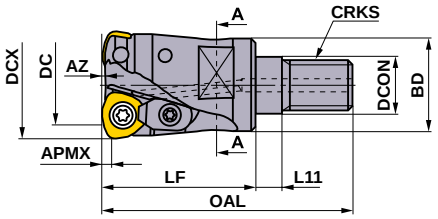


Fig.1

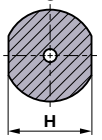


Fig.2

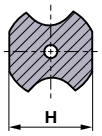
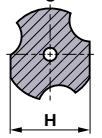


Fig.3



Section **A-A**

METRIC Standard

SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock	Coolant Thru ★3	Number of Teeth	Dimensions (mm)											Type (Fig.)	★1		★1		①②	
	R			DCX	DCON	BD	DC	OAL	LF	L11	H	CRKS ★2	APMX	AZ		Insert Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench	Insert
AJX06R162AM0830	★	Y	2	16	8.5	13	8.9	48	30	6	10	M8	1.0	0.3	1	TS25	—	—	—	①TKY08F	
AJX06R**172AM0830**	★	Y	2	17	8.5	13	9.9	48	30	6	10	M8	1.0	0.3	1	TS25	—	—	—	①TKY08F	JOM○ 06T215 ZZSR-○○
AJX06R**203AM1030**	★	Y	3	20	10.5	18	12.9	49	30	6	14	M10	1.0	0.3	3	TS25	—	—	—	①TKY08F	
AJX06R**223AM1030**	★	Y	3	22	10.5	18	14.9	49	30	6	14	M10	1.0	0.3	3	TS25	—	—	—	①TKY08F	
AJX08R202AM1030	★	Y	2	20	10.5	18	11.4	49	30	6	14	M10	1.5	0.5	2	TS33	—	—	—	①TKY08D	
AJX08R**222AM1030**	★	Y	2	22	10.5	18	13.4	49	30	6	14	M10	1.5	0.5	2	TS33	—	—	—	①TKY08D	JOM○ 080320 ZZSR-○○
AJX08R**253AM1235**	★	Y	3	25	12.5	21	16.4	57	35	6	19	M12	1.5	0.5	1	TS33	—	—	—	①TKY08D	
AJX08R**283AM1235**	★	Y	3	28	12.5	21	19.4	57	35	6	19	M12	1.5	0.5	1	TS33	—	—	—	①TKY08D	
AJX09R252AM1235	★	Y	2	25	12.5	21	14.9	57	35	6	19	M12	2.0	1.0	2	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
AJX09R**282AM1235**	★	Y	2	28	12.5	21	17.9	57	35	6	19	M12	2.0	1.0	2	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
AJX09R**303AM1645**	★	Y	3	30	17.0	29	20.0	68	45	6	24	M16	2.0	1.0	1	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	JDM○ 09T3○○ ZD○R-○○
AJX09R**323AM1645**	★	Y	3	32	17.0	29	21.9	68	45	6	24	M16	2.0	1.0	1	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
AJX09R**353AM1645**	★	Y	3	35	17.0	29	24.9	68	45	6	24	M16	2.0	1.0	1	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
AJX09R**404AM1645**	★	Y	4	40	17.0	29	29.9	68	45	6	24	M16	2.0	1.0	1	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
AJX12R302AM1645	★	Y	2	30	17.0	29	18.3	68	45	6	24	M16	2.0	1.5	2	TS407	AMS4	AJS4012T15	ASS2	②TKY15D	
AJX12R**322AM1645**	★	Y	2	32	17.0	29	20.3	68	45	6	24	M16	2.0	1.5	2	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	JDM○ 1204○○ ZD○R-○○
AJX12R**352AM1645**	★	Y	2	35	17.0	29	23.3	68	45	6	24	M16	2.0	1.5	2	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
AJX12R**403AM1645**	★	Y	3	40	17.0	29	28.3	68	45	6	24	M16	2.0	1.5	2	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	

★1 Clamp Torque (lbf-in) : TS25=8.9, TS33=8.9, TS351=22, TS407=31, TS43=31, AJS3010T10=22, AJS4012T15=31
★2 Clamp Torque of the Head (lbf-ft) : M8=17.1, M10=33.8, M12=59.2, M16=66.7
★3 Y=Yes

● : Inventory maintained. ○ : Inventory maintained. (Available Winter 2015)
★ : Inventory maintained in Japan.
<10 inserts in one case>

INSERTS

Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
S	Heat-resistant Alloy, Titanium Alloy	
H	Hardened Materials	

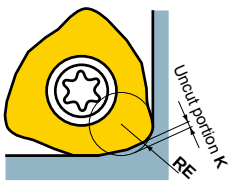
Cutting Conditions :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	Class	Coated									Dimensions (inch)					Geometry
			FH7020	MP6120 NEW	MP6130 NEW	MP7130 NEW	MP7140 NEW	MP9120 NEW	MP9130 NEW	VP15TF	VP30RT	AN	IC	S	BS	RE	
	JOMW06T215ZZSR-FT	M	●	●	●	●	●			●	●	13°	.250	.109	.047	.059	
	JOMW080320ZZSR-FT	M	●	●	●	●	●			●	●	13°	.315	.125	.055	.079	
	JDMW09T320ZDSR-FT	M	●	●	●	●	●			●	●	15°	.375	.156	.071	.079	
	JDMW120420ZDSR-FT	M	●	●	●	●	●			●	●	15°	.472	.187	.098	.079	
	JDMW140520ZDSR-FT	M	●	●	●	●	●			●	●	15°	.551	.219	.110	.079	
Strong Cutting Edge	JDMT120420ZDSR-ST	M	●	●	●	●	●			●	●	15°	.472	.187	.098	.079	
	JDMT140520ZDSR-ST	M	●	●	●	●	●			●	●	15°	.551	.219	.110	.079	
NEW	JOMT06T218ZZER-JL	M				○	○	○	○			13°	.250	.109	.047	.071	
	JOMT080326ZZER-JL	M				○	○	○	○			13°	.315	.125	.055	.102	
	JDMT09T323ZDER-JL	M				●	●	●	●			15°	.375	.156	.071	.091	
	JDMT120423ZDER-JL	M				●	●	●	●			15°	.472	.187	.098	.091	
	JDMT140523ZDER-JL	M				●	●	●	●			15°	.551	.219	.110	.091	
Lower Cutting Resistance	JOMT06T215ZZSR-JM	M	●	●	●	●	●			●	●	13°	.250	.109	.047	.059	
	JOMT080320ZZSR-JM	M	●	●	●	●	●			●	●	13°	.315	.125	.055	.079	
	JDMT09T320ZDSR-JM	M	●	●	●	●	●			●	●	15°	.375	.156	.071	.079	
	JDMT120420ZDSR-JM	M	●	●	●	●	●			●	●	15°	.472	.187	.098	.079	
	JDMT140520ZDSR-JM	M	●	●	●	●	●			●	●	15°	.551	.219	.110	.079	

(Note) Setting heights for ST chipbeaker and the other chipbreakers differ slightly.
If an ST type chipbreaker is used, please check the tool length offset height.

■ = MIRACLE SIGMA

NOTE FOR PROGRAMMING



When using the ***AJX***,
please program the approximate radius as indicated.
The approximate uncut portions for the program are as follows.

Insert size	Breaker	Approx. **RE**(inch)	Uncut portion **K**(inch)
JOM○06T2○○ZZ○R-○○	FT / JM	.079	.013
	JL	.098	.013
JOM○0803○○ZZ○R-○○	FT / JM	.098	.018
	JL	.079	.016
JOM○09T3○○ZD○R-○○	FT / JM	.118	.019
	JL	.118	.018
JOM○1204○○ZD○R-○○	FT / JM / ST	.118	.025
	JL	.118	.021
JOM○1405○○ZD○R-○○	FT / JM / ST	.118	.025
	JL	.118	.022

(Note) The uncut portion may change slightly depending on cutting conditions.

MILLING

SCREW-IN ARBORS ➤ K162
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

DEPTH OF CUT/FEED

	Work Material	Hardness	ϕ.625", ϕ.688" (ϕ16mm, ϕ17mm) (Shank type)			ϕ.750", ϕ.875" (ϕ20mm, ϕ22mm) (Shank type)			ϕ.750" (ϕ20mm) (Shank type)		
			AJXU06 Type			AJXU08 Type			AJXU06 Type		
			2 (Number of Teeth)			2 (Number of Teeth)			3 (Number of Teeth)		
			Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (IPT)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (IPT)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (IPT)
P	Mild Steel	≤180HB	5.5	.031	.031	6.3	.039	.039	6.3	.035	.035
			7.0	.024	.024	8.3	.031	.031	8.3	.028	.028
			8.2	.016	.016	9.4	.024	.024	9.4	.020	.020
	Carbon Steel	180—280HB	5.5	.031	.031	6.3	.039	.039	6.3	.035	.035
			7.0	.024	.024	8.3	.031	.031	8.3	.028	.028
			8.2	.016	.016	9.4	.024	.024	9.4	.020	.020
	Alloy Steel	280—350HB	5.5	.028	.031	6.3	.031	.039	6.3	.028	.035
			7.0	.020	.024	8.3	.024	.031	8.3	.020	.028
			8.2	.012	.016	9.4	.016	.024	9.4	.016	.020
	Alloy Tool Steel	≤350HB	5.5	.028	.031	6.3	.031	.039	6.3	.028	.035
			7.0	.020	.024	8.3	.024	.031	8.3	.020	.028
			8.2	.012	.016	9.4	.016	.024	9.4	.016	.020
	Pre-hardened Steel	≤35HRC	5.5	.028	.028	6.3	.031	.031	6.3	.028	.028
			7.0	.020	.020	8.3	.024	.024	8.3	.020	.020
			8.2	.012	.012	9.4	.016	.016	9.4	.016	.012
M	Stainless Steel	≤270HB	5.5	.031	.028	6.3	.039	.031	6.3	.035	.028
			7.0	.024	.020	8.3	.031	.024	8.3	.028	.020
			8.2	.016	.012	9.4	.024	.016	9.4	.020	.012
K	Gray Cast Iron	Tensile Strength ≤350MPa	5.5	.031	.039	6.3	.039	.047	6.3	.035	.039
			7.0	.024	.031	8.3	.031	.039	8.3	.028	.031
			8.2	.016	.024	9.4	.024	.031	9.4	.020	.024
	Ductile Cast Iron	Tensile Strength ≤450MPa	5.5	.028	.031	6.3	.031	.039	6.3	.028	.035
			7.0	.020	.024	8.3	.024	.031	8.3	.020	.028
			8.2	.012	.016	9.4	.016	.024	9.4	.016	.020
S	Heat Resistant Alloy	≤350HB	—	—	—	—	—	—	—	—	—
			—	—	—	—	—	—	—	—	—
	Titanium Alloy	—	—	—	—	—	—	—	—	—	—
H	Hardened Steel	43—55HRC	5.5	.020	.020	6.3	.020	.024	6.3	.020	.020
			7.0	.016	.012	8.3	.016	.016	8.3	.016	.016
			8.2	.012	.008	9.4	.012	.008	9.4	.012	.008

	ϕ1.000", ϕ1.125" (ϕ25mm, ϕ28mm) (Shank type)			**ϕ1.000" (ϕ25mm)** (Shank type)			**ϕ1.250" (ϕ32mm)** (Shank type)			**ϕ1.250" (ϕ32mm)** (Shank type)			**ϕ1.500" (ϕ40mm)** (ϕ1.250"shank)			**ϕ1.500" (ϕ40mm)** (ϕ1.250"shank)		
	AJXU09 Type			AJXU08 Type			AJXU12 Type			AJXU09 Type			AJXU12 Type			AJXU09 Type		
	2 (Number of Teeth)			3 (Number of Teeth)			2 (Number of Teeth)			3 (Number of Teeth)			3 (Number of Teeth)			4 (Number of Teeth)		
	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (IPT)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (IPT)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (IPT)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (IPT)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (IPT)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (IPT)
	6.7	.039	.047	6.7	.035	.039	7.0	.047	.055	7.0	.043	.047	7.0	.047	.055	7.0	.043	.047
	9.0	.031	.039	9.0	.028	.031	9.0	.039	.047	9.0	.035	.039	9.5	.039	.047	9.5	.035	.039
	11.5	.024	.031	11.5	.020	.024	11.0	.031	.039	11.5	.028	.031	12.0	.031	.039	12.0	.028	.031
	6.7	.039	.047	6.7	.035	.039	7.0	.047	.055	7.0	.043	.047	7.0	.047	.055	7.0	.043	.047
	9.0	.031	.039	9.0	.028	.031	9.0	.039	.047	9.0	.035	.039	9.5	.039	.047	9.5	.035	.039
	11.5	.024	.031	11.5	.020	.024	11.0	.031	.039	11.5	.028	.031	12.0	.031	.039	12.0	.028	.031
	6.7	.031	.047	6.7	.028	.039	7.0	.039	.055	7.0	.035	.047	7.0	.039	.055	7.0	.035	.047
	9.0	.024	.039	9.0	.020	.031	9.0	.031	.047	9.0	.028	.039	9.5	.031	.047	9.5	.028	.039
	11.5	.016	.031	11.5	.016	.024	11.0	.024	.039	11.5	.020	.031	12.0	.024	.039	12.0	.020	.031
	6.7	.031	.047	6.7	.028	.039	7.0	.039	.055	7.0	.035	.047	7.0	.039	.055	7.0	.035	.047
	9.0	.024	.039	9.0	.020	.031	9.0	.031	.047	9.0	.028	.039	9.5	.031	.047	9.5	.028	.039
	11.5	.016	.031	11.5	.016	.024	11.0	.024	.039	11.5	.020	.031	12.0	.024	.039	12.0	.020	.031
	6.7	.031	.039	6.7	.028	.035	7.0	.039	.047	7.0	.035	.039	7.0	.039	.047	7.0	.035	.039
	9.0	.024	.031	9.0	.020	.028	9.0	.031	.039	9.0	.028	.031	9.5	.031	.039	9.5	.028	.031
	11.5	.016	.024	11.5	.016	.020	11.0	.024	.031	11.5	.020	.024	12.0	.024	.031	12.0	.020	.024
	6.7	.039	.039	6.7	.035	.035	7.0	.047	.047	7.0	.043	.039	7.0	.047	.047	7.0	.043	.039
	9.0	.031	.031	9.0	.028	.028	9.0	.039	.039	9.0	.035	.031	9.5	.039	.039	9.5	.035	.031
	11.5	.024	.024	11.5	.020	.020	11.0	.031	.031	11.5	.028	.024	12.0	.031	.031	12.0	.028	.024
	6.7	.039	.055	6.7	.035	.047	7.0	.047	.063	7.0	.043	.055	7.0	.047	.063	7.0	.043	.055
	9.0	.031	.047	9.0	.028	.039	9.0	.039	.055	9.0	.035	.047	9.5	.039	.055	9.5	.035	.047
	11.5	.024	.039	11.5	.020	.031	11.0	.031	.047	11.5	.028	.035	12.0	.031	.047	12.0	.028	.035
	6.7	.031	.047	6.7	.028	.039	7.0	.039	.055	7.0	.035	.047	7.0	.039	.055	7.0	.035	.047
	9.0	.024	.039	9.0	.020	.031	9.0	.031	.047	9.0	.028	.039	9.5	.031	.047	9.5	.028	.039
	11.5	.016	.031	11.5	.016	.024	11.0	.024	.039	11.5	.020	.031	12.0	.024	.039	12.0	.020	.031
	6.7	.047	.024	—	—	—	7.0	.047	.024	7.0	.047	.024	7.0	.047	.024	7.0	.047	.024
	9.0	.039	.016	—	—	—	9.0	.039	.016	9.0	.039	.016	9.5	.039	.016	9.5	.039	.016
	11.5	.031	.012	—	—	—	11.0	.031	.012	11.5	.031	.012	12.0	.031	.012	12.0	.031	.012
	6.7	.020	.031	6.7	.020	.028	7.0	.024	.039	7.0	.020	.035	7.0	.024	.039	7.0	.020	.035
	9.0	.016	.024	9.0	.016	.020	9.0	.020	.031	9.0	.016	.028	9.5	.020	.031	9.5	.016	.028
	11.5	.012	.016	11.5	.012	.012	11.0	.016	.024	11.5	.012	.020	12.0	.016	.024	12.0	.012	.020

⋆ Depth of cut of JL breaker is up to .047inch.

RECOMMENDED CUTTING CONDITIONS

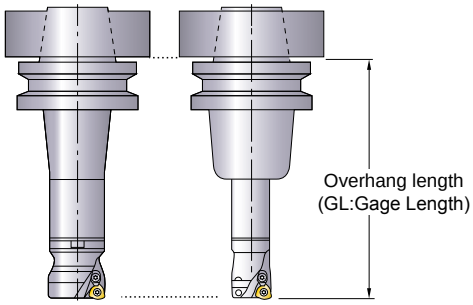
DEPTH OF CUT/FEED

	Work Material	Hardness	ϕ1.500" (ϕ40mm) (ϕ1.500"shank)			ϕ2.000" (ϕ50mm) (Shank type)			ϕ2.000", ϕ2.500" (ϕ50mm, ϕ63mm) (Arbor type)		
			AJXU12 Type			AJXU14 Type			AJXU12 Type (ϕ2.000") AJXU14 Type (ϕ2.500")		
			3 (Number of Teeth)			3 (Number of Teeth)			3 or 4 (Number of Teeth)		
			Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (IPT)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (IPT)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (IPT)
P	Mild Steel	≤180HB	7.0	.047	.059	7.0	.055	.059	6.0	.059	.059
			9.5	.039	.051	9.5	.047	.051	10.0	.051	.051
			12.0	.031	.043	—	—	—	14.0	.043	.043
	Carbon Steel	180—280HB	7.0	.047	.059	7.0	.055	.059	6.0	.059	.059
			9.5	.039	.051	9.5	.047	.051	10.0	.051	.051
			12.0	.031	.043	—	—	—	14.0	.043	.043
	Alloy Steel	280—350HB	7.0	.039	.059	7.0	.047	.059	6.0	.051	.059
			9.5	.031	.051	9.5	.039	.051	10.0	.043	.051
			12.0	.024	.043	—	—	—	14.0	.035	.043
	Alloy Tool Steel	≤350HB	7.0	.039	.059	7.0	.047	.059	6.0	.051	.059
			9.5	.031	.051	9.5	.039	.051	10.0	.043	.051
			12.0	.024	.043	—	—	—	14.0	.035	.043
	Pre-hardened Steel	≤35HRC	7.0	.039	.051	7.0	.047	.051	6.0	.051	.051
			9.5	.031	.043	9.5	.039	.043	10.0	.043	.043
			12.0	.024	.035	—	—	—	14.0	.035	.035
M	Stainless Steel	≤270HB	7.0	.047	.051	7.0	.055	.051	6.0	.059	.051
			9.5	.039	.043	9.5	.047	.043	10.0	.051	.043
			12.0	.031	.035	—	—	—	14.0	.043	.035
K	Gray Cast Iron	Tensile Strength ≤350MPa	7.0	.047	.067	7.0	.055	.067	6.0	.059	.067
			9.5	.039	.059	9.5	.047	.059	10.0	.051	.059
			12.0	.031	.051	—	—	—	14.0	.043	.051
	Ductile Cast Iron	Tensile Strength ≤450MPa	7.0	.039	.059	7.0	.047	.059	6.0	.051	.059
			9.5	.031	.051	9.5	.039	.051	10.0	.043	.051
			12.0	.024	.043	—	—	—	14.0	.035	.043
S	Heat Resistant Alloy	≤350HB	7.0	.047	.024	7.0	.047	.024	6.0	.047	.024
			9.5	.039	.016	9.5	.039	.016	10.0	.039	.016
	Titanium Alloy	—	12.0	.031	.012	—	—	—	14.0	.031	.012
H	Hardened Steel	43—55HRC	7.0	.024	.043	7.0	.031	.043	6.0	.035	.043
			9.5	.020	.035	9.5	.024	.035	10.0	.028	.035
			12.0	.016	.028	—	—	—	—	—	—

	ϕ2.000", ϕ2.500" (ϕ50mm, ϕ63mm) (Arbor type)			ϕ3.000", ϕ4.000", ϕ4.921", ϕ6.299" (ϕ80mm, ϕ100mm, ϕ125mm, ϕ160mm) (Arbor type)			ϕ3.000", ϕ4.000" (ϕ80mm, ϕ100mm) (Arbor type)		
	AJXU09 Type (ϕ2.000") AJXU12 Type (ϕ2.500")			AJXU14 Type AJX14 Type			AJXU12 Type		
	5 (Number of Teeth)			4 or 5 or 6 or 7 or 8 (Number of Teeth)			6 or 7 (Number of Teeth)		
	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (IPT)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (IPT)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (IPT)
	6.0	.053	.051	7.0	.059	.059	7.0	.053	.051
	10.0	.046	.043	12.0	.051	.051	12.0	.046	.043
	14.0	.039	.035	18.0	.039	.039	18.0	.035	.031
	6.0	.053	.051	7.0	.059	.059	7.0	.053	.051
	10.0	.046	.043	12.0	.051	.051	12.0	.046	.043
	14.0	.039	.035	18.0	.039	.039	18.0	.035	.031
	6.0	.046	.051	7.0	.051	.059	7.0	.046	.051
	10.0	.039	.043	12.0	.043	.051	12.0	.039	.043
	14.0	.032	.035	18.0	.031	.039	18.0	.028	.031
	6.0	.046	.051	7.0	.051	.059	7.0	.046	.051
	10.0	.039	.043	12.0	.043	.051	12.0	.039	.043
	14.0	.032	.035	18.0	.031	.039	18.0	.028	.031
	6.0	.046	.043	7.0	.051	.051	7.0	.046	.043
	10.0	.039	.035	12.0	.043	.043	12.0	.039	.035
	14.0	.032	.028	18.0	.031	.031	18.0	.028	.024
	6.0	.053	.043	7.0	.059	.051	7.0	.053	.043
	10.0	.046	.035	12.0	.051	.043	12.0	.046	.035
	14.0	.039	.028	18.0	.039	.031	18.0	.035	.024
	6.0	.053	.059	7.0	.059	.067	7.0	.053	.059
	10.0	.046	.051	12.0	.051	.059	12.0	.046	.051
	14.0	.039	.039	18.0	.039	.047	18.0	.035	.035
	6.0	.046	.051	7.0	.051	.059	7.0	.046	.051
	10.0	.039	.043	12.0	.043	.051	12.0	.039	.043
	14.0	.032	.035	18.0	.031	.039	18.0	.028	.031
	6.0	.047	.024	7.0	.047	.024	7.0	.047	.024
	10.0	.039	.016	12.0	.039	.016	12.0	.039	.016
	14.0	.031	.012	18.0	.031	.012	18.0	.031	.012
	6.0	.032	.039	7.0	.035	.043	7.0	.032	.039
	10.0	.025	.031	12.0	.028	.035	12.0	.025	.031
	—	—	—	—	—	—	—	—	—

* Depth of cut of JL breaker is up to .047inch.

①Overhang length



②Main spindle speed
N(min^{-1})=(Recommended cutting speed x 12)÷ (outer tool diameter x 3.14)

③Table feed rate
vf(inch/min)=N x feed per tooth x number of teeth

④Recommended width of cut (ae) is more than 60% of cutter diameter.

⑤The above cutting conditions are a guide when using a CAT50 size holder. In case of CAT40 and HSK63 machines, a cutter diameter of under 1.5 inch is recommended. In this case, reduce the depth of cut and table feed rate.

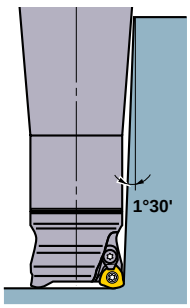
⑥Use of ***ST*** chipbreaker with a tougher cutting edge is recommended for interrupted cutting. For tough applications,***MP7140*** is recommended.

⑦A cutter body with a coarse pitch is recommended for use in unstable conditions such as a long tool overhang.

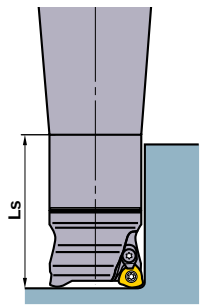
⑧Use "sharp" ***JM*** chipbreaker to lower cutting forces or when there is a long tool overhang.

⑨Large chips are generated when machining with the ***AJX***. To avoid chip jamming-related problems, machine using an air blow to disperse the chips effectively.

EFFECTIVE USE



The tapered body of the special arbor for the AJX enables machining without touching a finished wall with a 1°30' draft angle.



Vertical wall machining is possible within the range of Ls.

RECOMMENDED CUTTING CONDITIONS

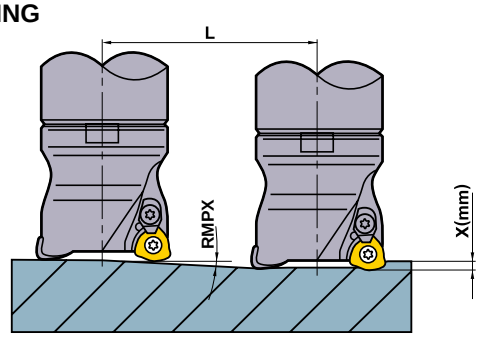
CUTTING SPEED

	Work Material	Hardness	Cutting speed (SFM) for different grades			
P			FH7020	MP6120	MP6130	VP30RT
	Mild Steel	≤180HB	850 (700—1000)	750 (580—910)	685 (515—845)	620 (450—880)
	Carbon Steel	180—280HB	550 (400—700)	480 (320—630)	415 (255—565)	350 (190—500)
	Alloy Steel	280—350HB	450 (300—600)	350 (190—500)	285 (125—435)	220 (60—370)
	Alloy Tool Steel	≤350HB	450 (300—600)	350 (190—500)	285 (125—435)	220 (60—370)
	Pre-hardened Steel	35—45HRC	—	330 (230—425)	265 (165—360)	200 (100—295)
M			MP7130	MP7140		
	Stainless Steel	≤270HB	450 (300—600)	385 (235—535)	—	—
K			FH7020	VP15TF		
	Gray Cast Iron	Tensile Strength ≤350MPa	850 (700—1000)	—	—	—
	Ductile Cast Iron	Tensile Strength ≤800MPa	—	550 (400—700)	—	—
S			MP9120	MP9130		
	Heat Resistant Alloy	≤350HB	100 (65—130)	80 (65—115)	—	—
	Titanium Alloy	—	165 (130—195)	150 (100—180)	—	—
H			VP15TF			
	Hardened Steel	40—55HRC	230 (165—295)	—	—	—

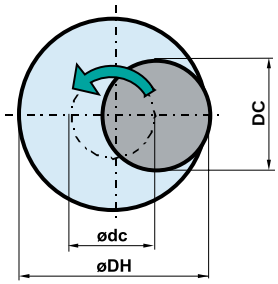
Work Material	Cutting Conditions
P K H	Light / General / Heavy: JM, FT, ST
M	JM, FT, ST, JL (NEW)
S	JL

MAXIMUM CAPACITIES BY MODE

RAMPING



HELICAL CUTTING



- How to calculate the theoretical center of the tool path.

ødc = øDH - DC

ødc: Theoretical center of the tool
øDH: Desired hole diameter
DC: Cutting edge diameter

- Please set the depth of cut per cycle under max. depth of cut (APMX).
- Please machine in a down cutting direction (climb milling).

- When ramping and helical cutting, it is recommended to reduce the feed rate by 40%.
- When drilling, please set the feed in the axial direction .008 inch/rev or less.
- The long chips generated can discharge in any direction, so ensure that adequate safety precautions are taken.

	Holder Type	Tool Diameter (inch)	Width of Face Cut (inch)	Max. Depth of Cut **APMX**(inch)		Ramp machining					Helical Cutting		Max. Drilling Depth **AZ** (inch)
						Max. Angle **RMPX**	Required "X" distance for "Z" inch depth (inch)				Min. Hole Diameter (inch)	Max. Hole Diameter (inch)	
				FT/JM/ ST	JL		Z=.039	Z=.047	Z=.059	Z=.079			
Shank Type	**AJXU06R102**	.63	.34	.039	—	3.0°	.744	—	—	—	.90	1.13	.012
	AJXU**06R112**	.69	.40	.039	—	2.5°	.893	—	—	—	1.02	1.26	.012
	AJXU**06R123**	.75	.47	.039	—	1.7°	1.314	—	—	—	1.15	1.38	.012
	AJXU**08R122**	.75	.41	.059	—	3.5°	.638	.768	.965	—	.99	1.34	.020
	AJXU**08R142**	.88	.53	.059	—	3.0°	.744	.897	1.126	—	1.24	1.59	.020
	AJXU**08R163**	1.00	.66	.059	—	2.0°	1.117	1.346	1.690	—	1.49	1.84	.020
	AJXU**09R162**	1.00	.59	.079	.047	4.0°	.558	.672	.844	1.130	1.33	1.84	.039
	AJXU**09R182**	1.13	.72	.079	.047	3.0°	.744	.897	1.126	1.507	1.58	2.09	.039
	AJXU**09R203**	1.25	.85	.079	.047	3.3°	.676	.815	1.023	1.370	1.83	2.34	.039
	AJXU**09R244**	1.50	1.11	.079	.047	2.4°	.931	1.121	1.408	1.885	2.33	2.84	.039
	AJXU**12R202**	1.25	.79	.079	.047	4.0°	.558	.672	.844	1.130	1.59	2.34	.059
	AJXU**12R243**	1.50	1.04	.079	.047	3.0°	.744	.897	1.126	1.507	2.09	2.84	.059
	AJXU**14R323**	2.00	1.53	.079	.047	4.2°	.531	.640	.803	1.076	2.90	3.84	.079
Arbor Type	**AJXU09R02**	2.00	1.61	.079	.047	1.1°	2.031	2.448	3.073	4.114	3.33	3.84	.039
	AJXU**12R02**	2.00	1.54	.079	.047	2.0°	1.117	1.346	1.690	2.262	3.09	3.84	.059
	AJXU**12R2505**	2.50	2.04	.079	.047	1.5°	1.489	1.795	2.253	3.017	4.09	4.84	.059
	AJXU**12R0306**	3.00	2.54	.079	.047	1.2°	1.862	2.244	2.817	3.771	5.09	5.84	.059
	AJXU**12R0407**	4.00	3.54	.079	.047	.8°	2.793	3.366	4.225	5.658	7.09	7.84	.059
	AJXU**14R25**	2.50	2.03	.079	.047	2.8°	.797	.961	1.206	1.615	3.90	4.84	.079
	AJXU**14R03**	3.00	2.53	.079	.047	1.8°	1.241	1.496	1.877	2.514	4.90	5.84	.079
	AJXU**14R04**	4.00	3.53	.079	.047	1.2°	1.862	2.244	2.817	3.771	6.90	7.84	.079
	AJX14RA125	4.92	4.53	.079	.047	.8°	2.793	3.366	4.225	5.658	8.74	9.68	.079
	AJX**14RA160**	6.30	5.83	.079	.047	.5°	4.469	5.386	6.761	9.053	11.50	12.44	.079

MULTI FUNCTIONAL MILLING

Roughing

Including Flat faces

ARX

P M K N S H



METRIC Standard

- Precision M-class 15°positive insert.
- Effective for various machining applications.
- Air / coolant through.

Fig.1 (Type with the center cutting edge)

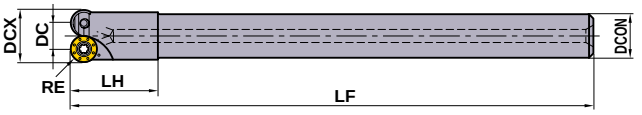
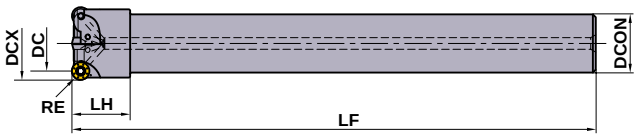


Fig.2 (Type without the center cutting edge (multi-tooth))



STEEL SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock R	Coolant Thru ★1	Number of Teeth	Dimensions (mm) RE	DCX	DCON	DC	LF	LH	Type (Fig.)	★2 Insert Screw	Wrench	Insert
With the Center Cutting Edge	ARX25R102SA10S	★	Y	2	2.5	10	10	5	120	20	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R122SA10S	★	Y	2	3.0	12	10	6	120	20	1	TPS22S	TIP07FS	RDMW0620M0E
	ARX35R142SA12S	★	Y	2	3.5	14	12	7	140	20	1	TPS22	TIP07FS	RDMW0724M0E
Without the Center Cutting Edge (Multi-tooth)	ARX25R122SA10S	★	Y	2	2.5	12	10	7	120	20	2	TPS20	TIP06F	RDMW0517M0E
	ARX25R163SA16S	★	Y	3	2.5	16	16	11	180	20	2	TPS20	TIP06F	RDMW0517M0E
	ARX30R163SA16S	★	Y	3	3.0	16	16	10	180	20	2	TPS22	TIP07FS	RDMW0620M0E
	ARX25R173SA16S	★	Y	3	2.5	17	16	12	180	20	2	TPS20	TIP06F	RDMW0517M0E
	ARX30R173SA16S	★	Y	3	3.0	17	16	11	180	20	2	TPS22	TIP07FS	RDMW0620M0E
	ARX25R204SA20S	★	Y	4	2.5	20	20	15	180	20	2	TPS20	TIP06F	RDMW0517M0E
	ARX30R203SA20S	★	Y	3	3.0	20	20	14	180	20	2	TPS22	TIP07FS	RDMW0620M0E
	ARX25R224SA20S	★	Y	4	2.5	22	20	17	180	20	2	TPS20	TIP06F	RDMW0517M0E
	ARX30R224SA20S	★	Y	4	3.0	22	20	16	180	20	2	TPS22	TIP07FS	RDMW0620M0E
	ARX25R255SA20S	★	Y	5	2.5	25	20	20	180	20	2	TPS20	TIP06F	RDMW0517M0E
	ARX30R254SA20S	★	Y	4	3.0	25	20	19	180	20	2	TPS22	TIP07FS	RDMW0620M0E

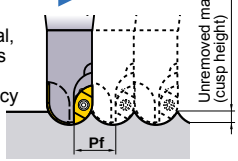
★1 Y=Yes ★2 Clamp Torque (lbf-in) : TPS20=5.3, TPS22=5.3, TPS22S=5.3

Using the ARX Effectively (Reducing Unremoved Material)

●When Milling Even Surfaces

Ball nose end milling

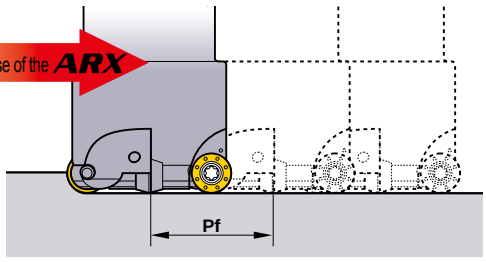
To reduce unremoved material, the pick feed needs to be reduced. (Machining efficiency will decrease.)



With the use of the ARX

Higher machining efficiency

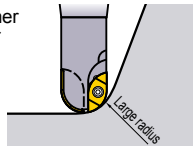
Even with a large pick feed, no unremoved material will remain.



●When Milling Corner Radius

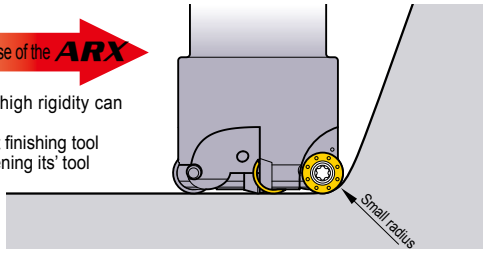
Ball nose end milling

To machine small corner radii, the tool diameter needs to be reduced. (Tool rigidity will decrease.)



With the use of the ARX

A large shank diameter offering high rigidity can also machine small corner radii. (The cutting load of a subsequent finishing tool will be decreased thereby lengthening its' tool life. Surface finish quality will be improved.)



★ : Inventory maintained in Japan.



Fig.1

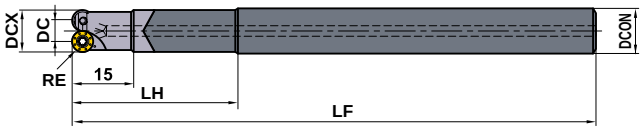


Fig.2

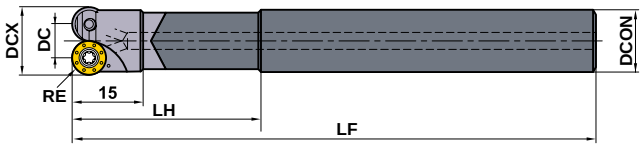
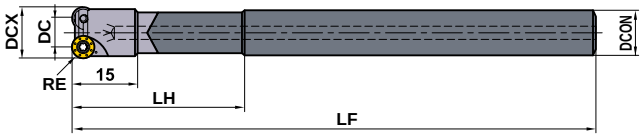


Fig.3



METRIC Standard

CARBIDE SHANK TYPE

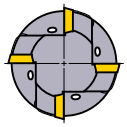
Right hand tool holder only.

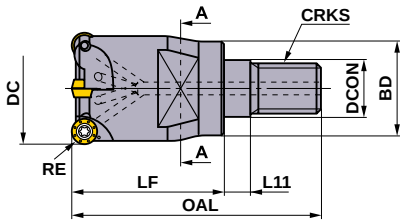
Type	Order Number	Stock	Coolant Thru ★1	Number of Teeth	Dimensions (mm)						Type (Fig.)	★2		
		R			RE	DCX	DCON	DC	LF	LH		Insert Screw	Wrench	Insert
With the Center Cutting Edge	**ARX25R102SA10LW**	★	Y	2	2.5	10	10	5	150	40	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R122SA10LW	★	Y	2	3.0	12	10	6	150	40	1	TPS22S	TIP07FS	RDMW0620M0E
	ARX35R142SA12LW	★	Y	2	3.5	14	12	7	170	40	2	TPS22	TIP07FS	RDMW0724M0E
Without the Center Cutting Edge (Multi-tooth)	**ARX25R122SA10LW**	★	Y	2	2.5	12	10	7	150	40	3	TPS20	TIP06F	RDMW0517M0E

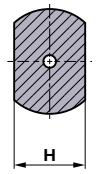
★1 Y=Yes

★2 Clamp Torque (lbf-in) : TPS20=5.3, TPS22=5.3, TPS22S=5.3









Section **A-A**

METRIC Standard

SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock	Coolant Thru ★3	Number of Teeth	Dimensions (mm)									★4 WT	★1		
	R			RE	DC	DCON	BD	OAL	LF	L11	H	CRKS ★2	(kg)	Insert Screw	Wrench	Insert
ARX25R163M08A30	★	Y	3	2.5	16	8.5	14.7	48	30	6	10	M8	0.1	TPS20	TIP06F	RDMW0517M0E
ARX25R173M08A30	★	Y	3	2.5	17	8.5	14.5	48	30	6	10	M8	0.1	TPS20	TIP06F	RDMW0517M0E
ARX25R204M10A30	★	Y	4	2.5	20	10.5	18.6	49	30	6	14	M10	0.2	TPS20	TIP06F	RDMW0517M0E
ARX25R224M10A30	★	Y	4	2.5	22	10.5	18.5	49	30	6	14	M10	0.2	TPS20	TIP06F	RDMW0517M0E
ARX25R255M12A35	★	Y	5	2.5	25	12.5	23.6	57	35	6	19	M12	0.2	TPS20	TIP06F	RDMW0517M0E
ARX30R163M08A30	★	Y	3	3.0	16	8.5	14.6	48	30	6	10	M8	0.1	TPS22	TIP07FS	RDMW0620M0E
ARX30R173M08A30	★	Y	3	3.0	17	8.5	14.5	48	30	6	10	M8	0.1	TPS22	TIP07FS	RDMW0620M0E
ARX30R203M10A30	★	Y	3	3.0	20	10.5	18.5	49	30	6	14	M10	0.2	TPS22	TIP07FS	RDMW0620M0E
ARX30R224M10A30	★	Y	4	3.0	22	10.5	18.5	49	30	6	14	M10	0.2	TPS22	TIP07FS	RDMW0620M0E
ARX30R254M12A35	★	Y	4	3.0	25	12.5	23.4	57	35	6	19	M12	0.2	TPS22	TIP07FS	RDMW0620M0E

★1 Clamp Torque (lbf-in) : TPS20=5.3, TPS22=5.3

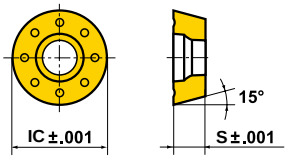
★2 Clamp Torque of the Head (lbf-ft) : M8=17.1, M10=33.8, M12=59.2

★3 Y=Yes

★4 WT : Mass

INSERTS	➤ K124
SCREW-IN ARBORS	➤ K162
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

INSERTS

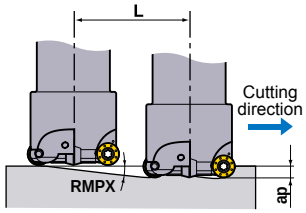
Shape	Order Number	Coated VP15TF	Coated MP8010	Dimensions (mm) IC	Dimensions (mm) S	Geometry
	**RDMW0517M0E**	★	★	5.0	1.70	
	RDMW0620M0E	★	★	6.0	1.99	
	RDMW0724M0E	★	★	7.0	2.38	

CUTTING MODE MAXIMUM CAPACITIES

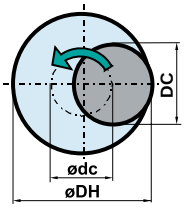
RAMPING

Finding a cutters' distance moved **"L"** when depth of cut reaches **"ap"** at a ramping angle of **"α°"**.

L=ap/tan α (mm)



HELICAL CUTTING



- Setting a tool's center excursion

ødc = øDH - DC

Tool's center excursion | Required bore diameter | Tool's cutting diameter

- For the depth of cut per pass, refer to the cutting conditions on page K124 for helical cutting.
- Set the machine spindle revolution so that the tool is rotating and cutting in a down cut direction.

Type	Order Number	DC (mm)	RE (mm)	Number of Teeth	Ramping RMPX ★1	Ramping APMX (mm) ★2	Ramping L (mm)	Helical Cutting DH min. (mm)	Helical Cutting DH max. (mm)
With the Center Cutting Edge	**ARX25R102SA10S**	10	2.5	2	90°	2.5	0	15	19
	ARX25R102SA10LW	10	2.5	2	90°	2.5	0	15	19
	ARX30R122SA10S	12	3.0	2	90°	3.0	0	18	23
	ARX30R122SA10LW	12	3.0	2	90°	3.0	0	18	23
	ARX35R142SA12S	14	3.5	2	90°	3.5	0	21	27
	ARX35R142SA12LW	14	3.5	2	90°	3.5	0	21	27
Without the Center Cutting Edge (Multi-tooth)	**ARX25R122SA10S**	12	2.5	2	27.17°	2.5	4.87	19	23
	ARX25R122SA10LW	12	2.5	2	27.17°	2.5	4.87	19	23
	ARX30R163SA16S	16	3.0	3	21.25°	3.0	7.71	26	31
	ARX25R163SA16S	16	2.5	3	13.70°	2.5	10.26	27	31
	ARX30R173SA16S	17	3.0	3	18.42°	3.0	9.01	28	33
	ARX25R173SA16S	17	2.5	3	12.22°	2.5	11.54	29	33
	ARX30R203SA20S	20	3.0	3	13.21°	3.0	12.78	34	39
	ARX25R204SA20S	20	2.5	4	9.23°	2.5	15.38	35	39
	ARX30R224SA20S	22	3.0	4	11.13°	3.0	15.25	38	43
	ARX25R224SA20S	22	2.5	4	7.94°	2.5	17.92	39	43
	ARX30R254SA20S	25	3.0	4	9.01°	3.0	18.92	44	49
	ARX25R255SA20S	25	2.5	5	6.57°	2.5	21.71	45	49

★1 RMPX : Max. Ramping Angle
★2 APMX : Max. Depth of Cut

★ : Inventory maintained in Japan.
<10 inserts in one case>

RECOMMENDED CUTTING CONDITIONS

(Note) The cutting conditions below are a guide only.
Please make adjustments according to the machining conditions.

SHOULDER • POCKET • RAMPING • COPYING

	Work Material	Hardness	Grade	Cutting Speed **vc** (SFM)	ARX25R□□□SA□□S		ARX30R□□□SA□□S		ARX35R□□□SA□□S	
					Depth of Cut **ap** (inch)	Feed per Tooth **fz** (inch/tooth)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (inch/tooth)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (inch/tooth)
P	Mild Steel	≤180HB	**VP15TF**	590 (490—720)	≤.039	≤.020	≤.047	≤.020	≤.059	≤.020
P	Carbon Steel, Alloy Steel	180—350HB	**VP15TF**	525 (395—655)	≤.028	≤.012	≤.035	≤.012	≤.047	≤.012
M	Stainless Steel	≤270HB	**VP15TF**	490 (395—590)	≤.028	≤.012	≤.035	≤.012	≤.047	≤.012
K	Cast Iron	Tensile strength≤450MPa	**VP15TF**	590 (490—720)	≤.039	≤.020	≤.047	≤.020	≤.059	≤.020
H	Hardened Steel	45—55HRC	**VP15TF**	260 (165—395)	≤.020	≤.008	≤.028	≤.008	≤.039	≤.008

(Note) When ramping, refer to the machining limits on page K122.

SLOTTING

	Work Material	Hardness	Grade	Cutting Speed **vc** (SFM)	ARX25R□□□SA□□S		ARX30R□□□SA□□S		ARX35R□□□SA□□S	
					Depth of Cut **ap** (inch)	Feed per Tooth **fz** (inch/tooth)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (inch/tooth)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (inch/tooth)
P	Mild Steel	≤180HB	**VP15TF**	590 (490—720)	≤.039	≤.016	≤.047	≤.016	≤.059	≤.016
P	Carbon Steel, Alloy Steel	180—350HB	**VP15TF**	525 (395—655)	≤.028	≤.008	≤.035	≤.008	≤.047	≤.008
M	Stainless Steel	≤270HB	**VP15TF**	490 (395—590)	≤.028	≤.008	≤.035	≤.008	≤.047	≤.008
K	Cast Iron	Tensile strength≤450MPa	**VP15TF**	590 (490—720)	≤.039	≤.016	≤.047	≤.016	≤.059	≤.016
H	Hardened Steel	45—55HRC	**VP15TF**	260 (165—395)	≤.020	≤.004	≤.028	≤.004	≤.039	≤.004

PLUNGING

	Work Material	Hardness	Grade	Cutting Speed **vc** (SFM)	ARX25R□□□SA□□S		ARX30R□□□SA□□S		ARX35R□□□SA□□S	
					Width of Cut **ae** (inch)	Feed per Tooth **fz** (inch/tooth)	Width of Cut **ae** (inch)	Feed per Tooth **fz** (inch/tooth)	Width of Cut **ae** (inch)	Feed per Tooth **fz** (inch/tooth)
P	Mild Steel	≤180HB	**VP15TF**	590 (490—720)	≤.098	≤.012	≤.118	≤.012	≤.138	≤.012
P	Carbon Steel, Alloy Steel	180—350HB	**VP15TF**	525 (395—655)	≤.098	≤.008	≤.118	≤.008	≤.138	≤.008
M	Stainless Steel	≤270HB	**VP15TF**	490 (395—590)	≤.098	≤.008	≤.118	≤.008	≤.138	≤.008
K	Cast Iron	Tensile strength≤450MPa	**VP15TF**	590 (490—720)	≤.098	≤.012	≤.118	≤.012	≤.138	≤.012
H	Hardened Steel	45—55HRC	**VP15TF**	260 (165—395)	≤.098	≤.004	≤.118	≤.004	≤.138	≤.004

HELICAL DRILLING

	Work Material	Hardness	Grade	Cutting Speed **vc** (SFM)	ARX25R□□□SA□□S		ARX30R□□□SA□□S		ARX35R□□□SA□□S	
					Depth of Cut Per Pass **ap** (inch/pass)	Feed per Tooth **fz** (inch/tooth)	Depth of Cut Per Pass **ap** (inch/pass)	Feed per Tooth **fz** (inch/tooth)	Depth of Cut Per Pass **ap** (inch/pass)	Feed per Tooth **fz** (inch/tooth)
P	Mild Steel	≤180HB	**VP15TF**	590 (490—720)	≤.039	≤.012	≤.039	≤.012	≤.039	≤.012
P	Carbon Steel, Alloy Steel	180—350HB	**VP15TF**	525 (395—655)	≤.028	≤.008	≤.035	≤.008	≤.039	≤.008
M	Stainless Steel	≤270HB	**VP15TF**	490 (395—590)	≤.028	≤.008	≤.035	≤.008	≤.039	≤.008
K	Cast Iron	Tensile strength≤450MPa	**VP15TF**	590 (490—720)	≤.039	≤.012	≤.039	≤.012	≤.039	≤.012
H	Hardened Steel	45—55HRC	**VP15TF**	260 (165—395)	≤.020	≤.004	≤.028	≤.004	≤.039	≤.004

(Note) When helical drilling, refer to the machining limits on page K122.

MULTI FUNCTIONAL MILLING

Roughing

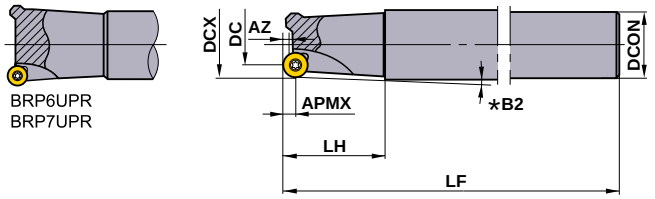
BRP

P M K N S H



- 11° positive insert.
- Round shape insert gives strong cutting edge.
- A wide variety of lengths available.
- Suitable for machining of die and mold.

Fig.1



*Please allow for an inclination angle of B2+1°

Fig.2

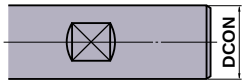


Fig.3

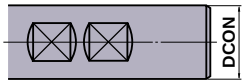
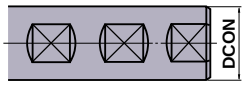


Fig.4



SHANK TYPE

Right hand tool holder only.

Corner Radius	Type *1	Order Number	Stock R	Number of Teeth	Dimensions (inch) DCX	DC	LF	DCON	LH	AZ	APMX	B2	Type (Fig.)	*2 Insert Screw	Wrench	Insert
.156	R	BRP3UNR081W08	●	1	.500	.177	2.781	.500	1.000	.007	.146	2° 56'	2	CS250560T	①TKY08F	①RPMW07T200E ②RPMT07T200E-JS
		BRP3UNR101W10	●	1	.625	.303	3.500	.625	1.000	.039	.146	2° 56'	3	CS250560T	①TKY08F	
		BRP3UNR122W12	●	2	.750	.429	4.000	.750	1.250	.066	.146	2° 16'	3	CS250560T	①TKY08F	
		BRP3UNR163W16	●	3	1.000	.681	4.500	1.000	1.250	.078	.146	2° 16'	4	CS250560T	①TKY08F	
	L	BRP3UNR081LW08	●	1	.500	.177	6.000	.500	2.800	.007	.146	0° 56'	1	CS250560T	①TKY08F	
		BRP3UNR101LW10	●	1	.625	.303	6.000	.625	2.800	.039	.146	0° 56'	1	CS250560T	①TKY08F	
	EL	BRP3UNR122ELW12	●	2	.750	.429	10.000	.750	5.100	.066	.146	0° 30'	1	CS250560T	①TKY08F	
		BRP3UNR163ELW16	●	3	1.000	.681	10.000	1.000	5.100	.078	.146	0° 30'	1	CS250560T	①TKY08F	
.187	R	BRP4UNR101W10	●	1	.625	.244	3.500	.625	1.000	.011	.177	3° 3'	3	CS350760T	①TKY15F	①RPMW09T300E ②RPMT09T300E-JS
		BRP4UNR121W12	●	1	.750	.366	4.000	.750	1.250	.035	.177	2° 20'	3	CS350760T	①TKY15F	
		BRP4UNR162W16	●	2	1.000	.618	4.500	1.000	1.250	.098	.177	2° 20'	4	CS350760T	①TKY15F	
		BRP4UNR203W20	●	3	1.250	.866	5.000	1.250	1.750	.098	.177	1° 35'	4	CS350760T	①TKY15F	
	L	BRP4UNR101LW10	●	1	.625	.244	6.000	.625	2.800	.011	.177	0° 57'	1	CS350760T	①TKY15F	
		BRP4UNR121LW12	●	1	.750	.366	7.000	.750	3.900	.035	.177	0° 40'	1	CS350760T	①TKY15F	
	EL	BRP4UNR162ELW16	●	2	1.000	.618	10.000	1.000	5.100	.098	.177	0° 30'	1	CS350760T	①TKY15F	
		BRP4UNR203ELW20	●	3	1.250	.866	12.000	1.250	7.100	.098	.177	0° 22'	1	CS350760T	①TKY15F	
.250	R	BRP6UPR202W20	●	2	1.250	.744	5.000	1.250	1.750	.157	.240	—	4	TS43	②TKY15D	①RPMW120400E ②RPMT120400E-JS
		BRP6UPR243W20	●	3	1.500	.976	5.000	1.250	1.750	.157	.240	—	4	TS43	②TKY15D	
		BRP6UPR324W20	●	4	2.000	1.492	5.000	1.250	1.750	.157	.240	—	4	TS43	②TKY15D	
		BRP6UPR405W20	●	5	2.500	1.999	5.000	1.250	1.750	.157	.240	—	4	TS43	②TKY15D	
	EL	BRP6UPR202ELS20	●	2	1.250	.744	12.000	1.250	1.750	.157	.240	—	1	TS43	②TKY15D	
		BRP6UPR243ELS20	●	3	1.500	.996	12.000	1.250	1.750	.157	.240	—	1	TS43	②TKY15D	
		BRP6UPR324ELS20	●	4	2.000	1.492	12.000	1.250	1.750	.157	.240	—	1	TS43	②TKY15D	
.312	R	BRP7UPR323W20	●	3	2.000	1.370	5.000	1.250	1.750	.217	.302	—	4	TS54	②TKY25D	①RPMW150600E ②RPMT150600E-JS
		BRP7UPR404W20	●	4	2.500	1.866	5.000	1.250	1.750	.217	.302	—	4	TS54	②TKY25D	
	EL	BRP7UPR323ELS20	●	3	2.000	1.370	12.000	1.250	1.750	.217	.302	—	1	TS54	②TKY25D	

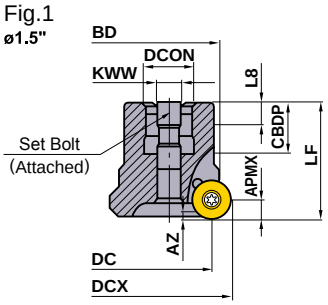
*1 Type R : Standard shank, L : Long shank, EL : Extra Long shank

*2 Clamp Torque (lbf-in) : CS250560T=8.9, CS350760T=31, TS43=31, TS54=66

● : Inventory maintained.
<10 inserts in one case>

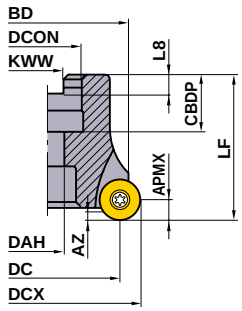


Fig.1
ø1.5"



Use the attached set bolt.

Fig.2
ø2"
ø2.5"
ø3"
ø4"



ARBOR TYPE

Right hand tool holder only.

Corner Radius	Order Number	Stock R	Number of Teeth	Dimensions (inch) DCX	DC	BD	LF	DCON	CBDP	DAH	KWW	L8	Max. Depth of cut AZ	APMX	Type (Fig.)	Insert
.250	**BRP6UPR1503X**	●	3	1.500	.996	1.228	2.000	.750	.748	–	.313	.187	.157	.240	1	RPMW120400E RPMT120400E-JS
	BRP6UPR**0204**	●	4	2.000	1.492	1.715	2.000	.750	.748	.415	.313	.187	.157	.240	2	
	BRP6UPR**2505**	●	5	2.500	1.992	2.214	2.000	.750	.748	.415	.313	.187	.157	.240	2	
	BRP6UPR**0306C**	●	6	3.000	2.492	2.706	2.000	1.000	1.024	.539	.375	.219	.157	.240	2	
	BRP6UPR**0407E**	●	7	4.000	3.492	3.696	2.500	1.500	1.181	.787	.625	.375	.157	.240	2	
.312	**BRP7UPR2504**	●	4	2.500	1.866	2.165	2.000	.750	.748	.415	.313	.187	.217	.302	2	RPMW150600E RPMT150600E-JS
	BRP7UPR**0305C**	●	5	3.000	2.366	2.649	2.000	1.000	.969	.539	.375	.219	.217	.302	2	
	BRP7UPR**0406E**	●	6	4.000	3.366	3.631	2.500	1.500	1.122	.787	.625	.375	.217	.302	2	

SPARE PARTS

Tool Holder Number	Insert Screw *	Wrench	Set Screw
BRP6UPR1503X	TS43	TKY15D	HDSU37513
BRP6UPR0204 ~ BRP6UPR0407E	TS43	TKY15D	–
BRP7UPR2504 ~ BRP7UPR0406E	TS54	TKY25D	–

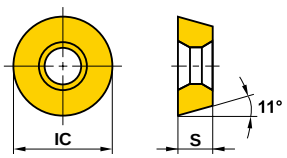
1) ✶ Clamp Torque (lbf-in) : TS43=31, TS54=66
2) Set bolt not included.

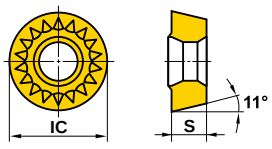
INSERTS

Work Material			F7010		VP15TF	
	P	Steel	●		●	
	M	Stainless Steel	●		●	
	K	Cast Iron			✣	
	S	Heat-resistant Alloy, Titanium Alloy			●	
	H	Hardened Materials			●	

Cutting Conditions :
● : Stable Cutting ● : General Cutting ✣ : Unstable Cutting

Shape	Order Number	Class	F7010		VP15TF		Dimensions (inch) IC	S	Geometry
	RPMW120400E	M	●		●		.500	.188	
	RPMW**150600E**	M			●		.625	.250	
JS breaker	**RPMT07T200E-JS**	M			●		.313	.109	
	RPMT**09T300E-JS**	M			●		.375	.156	
	RPMT**120400E-JS**	M			●		.500	.188	
	RPMT**150600E-JS**	M			●		.625	.250	





MILLING

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

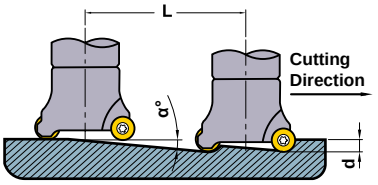
Work Material			Cutting Speed (SFM)	
			CVD	PVD
	Material	Hardness	F7010 / F7030 / F620	VP15TF / AP20M
P	Mild Steel	≤180HB	820 (660–980)	820 (660–980)
	Carbon Steel	180–280HB	590 (425–720)	590 (425–720)
	Alloy Steel	280–380HB	525 (360–620)	525 (360–620)
	Prehardened Steel	35–45HB	390 (260–460)	390 (260–460)
	High Alloy Steel	≤300HB	425 (295–525)	425 (295–525)
	Sintered Steel	45–60HRC	–	215 (155–275)
M	Stainless Steel	≤260HB	590 (425–720)	590 (425–720)
K	Gray Cast Iron	Tensile Strength≤350MPa	–	570 (425–720)
	Ductile Cast Iron	Tensile Strength 360–500MPa	–	470 (340–600)
		Tensile Strength 500–800MPa	–	360 (260–460)

FEED PER TOOTH (IPT) FOR STRAIGHT LINE (NON-RAMPING) CUTTING ONLY

Type	Depth of Cut (inch)								
	.040	.080	.120	.150	.180	.200	.240	.280	.320
BRP3U	.012	.009	.008	.006	–	–	–	–	–
BRP4U	.014	.012	.010	.010	.007	–	–	–	–
BRP6U	.020	.016	.012	.012	.011	.009	.008	–	–
BRP7U	.024	.020	.018	.016	.012	.013	.012	.010	.008

RAMPING

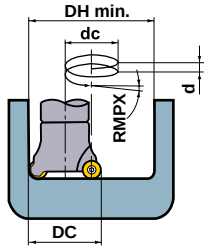
Type	Tool Diameter (inch)	Max. Ramping Angle RMPX	Tan α per inch	Min. Cutting Length According to Max. Ramping Angle **L** min. (inch)						
				d= .094"	d= .125"	d= .156"	d= .188"	d= .250"	d= .281"	d= .312"
BRP3U	.500	3.71°	.065°	1.446	1.923	2.400	–	–	–	–
	.625	12.34°	.219°	.429	.571	.712	–	–	–	–
	.750	13.50°	.240°	.392	.521	.650	–	–	–	–
	1.000	8.48°	.149°	.631	.839	1.047	–	–	–	–
BRP4U	.625	4.07°	.071°	1.324	1.761	2.197	2.648	–	–	–
	.750	8.41°	.148°	.635	.845	1.054	1.270	–	–	–
	1.000	12.98°	.231°	.407	.541	.675	.814	–	–	–
	1.250	8.18°	.144°	.653	.868	1.083	1.306	–	–	–
BRP6U	1.250	17.3°	.312°	.301	.401	.500	.603	.801	–	–
	1.500	11.78°	.209°	.450	.598	.746	.900	1.196	–	–
	2.000	7.15°	.125°	.752	1.000	1.248	1.504	2.000	–	–
	2.500	5.13°	.090°	1.044	1.389	1.733	2.089	2.778	–	–
	3.000	3.99°	.070°	1.343	1.786	2.229	2.686	3.571	–	–
	4.000	2.77°	.048°	1.958	2.604	3.250	3.917	5.208	–	–
BRP7U	2.000	11.49°	.203°	.463	.616	.768	.926	1.232	1.384	1.537
	2.500	7.88°	.138°	.681	.906	1.130	1.362	1.812	2.036	2.261
	3.000	5.99°	.105°	.895	1.190	1.486	1.790	2.381	2.676	2.971
	4.000	4.04°	.071°	1.324	1.761	2.197	2.648	3.521	3.958	4.394



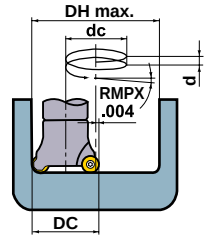
INTERPOLATING

CUTTING HOLE DIAMETER AND DEPTH OF CUT

Minimum Cutting Diameter



Maximum Cutting Diameter



Type	DC (inch)	✶1 ϕDH min.	✶2 ϕdc	Inclination Angle RMPX d=.094"	d=.156"	d=.188"	d=.250"	d=.312"	✶1 ϕDH max.	✶2 ϕdc	Inclination Angle RMPX d=.094"	d=.156"	d=.188"	d=.250"	d=.312"
BRP3U	.500	.688	.188	d=.039 → RMPX=3.778°					.922	.422	d=.078 → RMPX= 3.367°				
	.625	.938	.313	5.461°	9.015°	—	—	—	1.172	.547	3.131°	5.187°	—	—	—
	.750	1.188	.438	3.908°	6.468°	—	—	—	1.422	.672	2.549°	4.226°	—	—	—
	1.000	1.688	.688	2.490°	4.128°	—	—	—	1.922	.922	1.859°	3.083°	—	—	—
BRP4U	.625	.874	.249	d=.039 → RMPX=2.854°					1.172	.547	3.131°	5.187°	6.243°	—	—
	.750	1.124	.374	4.574°	7.563°	9.091°	—	—	1.422	.672	2.549°	4.226°	5.089°	—	—
	1.000	1.624	.624	2.745°	4.550°	5.478°	—	—	1.922	.922	1.859°	3.083°	3.714°	—	—
	1.250	2.124	.874	1.961°	3.252°	3.917°	—	—	2.422	1.172	1.462°	2.426°	2.923°	—	—
BRP6U	1.250	2.000	.750	2.285°	3.788°	4.562°	6.057°	—	2.422	1.172	1.462°	2.426°	2.923°	3.884°	—
	1.500	2.500	1.000	1.714°	2.843°	3.425°	4.550°	—	2.922	1.422	1.205°	2.000°	2.410°	3.203°	—
	2.000	3.500	1.500	1.143°	1.896°	2.285°	3.037°	—	3.922	1.922	.892°	1.480°	1.783°	2.371°	—
	2.500	4.500	2.000	.857°	1.422°	1.714°	2.279°	—	4.922	2.422	.708°	1.175°	1.415°	1.882°	—
	3.000	5.500	2.500	.686°	1.138°	1.371°	1.823°	—	5.922	2.922	.587°	.974°	1.173°	1.560°	—
	4.000	7.500	3.500	.490°	.813°	.980°	1.302°	—	7.922	3.922	.437°	.725°	.874°	1.162°	—
BRP7U	2.000	3.376	1.376	1.246°	2.067°	2.490°	3.310°	4.128°	3.922	1.922	.892°	1.480°	1.783°	2.371°	2.958°
	2.500	4.376	1.876	.914°	1.516°	1.827°	2.429°	3.030°	4.922	2.422	.708°	1.175°	1.415°	1.882°	2.348°
	3.000	5.376	2.376	.721°	1.197°	1.443°	1.918°	2.393°	5.922	2.922	.587°	.974°	1.173°	1.560°	1.947°
	4.000	7.376	3.376	.508°	.842°	1.016°	1.350°	1.685°	7.922	3.922	.437°	.725°	.874°	1.162°	1.451°

✶1 DH = Cutting Hole Diameter : ϕ (inch)
✶2 dc = Tool Pass Diameter : ϕ (inch)

BRP3U type DH min. = (DC-.156) X 2, DH max. = (DC-.039) X 2, d max. =.156 (inch)
BRP4U type DH min. = (DC-.188) X 2, DH max. = (DC-.039) X 2, d max. =.188 (inch)
BRP6U type DH min. = (DC-.250) X 2, DH max. = (DC-.039) X 2, d max. =.250 (inch)
BRP7U type DH min. = (DC-.312) X 2, DH max. = (DC-.039) X 2, d max. =.312 (inch)
dc = DH-D
✶DH min. (Minimum Cutting Diameter) DH max.(Maximum Cutting Diameter) d (Maximum Depth of Cut)

MULTI FUNCTIONAL MILLING

Roughing

BOE

P M K N S H



- 20° positive insert.
- Compatible with 8-corner use insert and round type insert.
- Multi functional milling.

Fig.1 (BOE4 type)

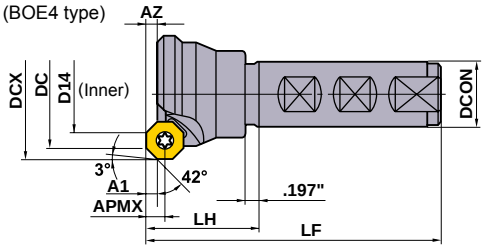
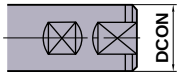


Fig.2 (BOE type)



WELDON SHANK TYPE

Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (inch)						Max. Depth of Cut			★	①②	①②
	R		DCX	DC	D14	LF	DCON	LH	A1	APMX	AZ	Insert Screw	Wrench	Insert
BOE4R202W20	●	2	1.250	.925	.516	5.022	1.250	1.772	.098	.276	.118	CS350990T	①TKY10F	
BOE4R243W20	●	3	1.500	1.177	.767	5.022	1.250	1.772	.098	.276	.118	CS350990T	①TKY10F	①OEMX12T3ETR
BOE4R323W20	●	3	2.000	1.680	1.269	5.022	1.250	1.772	.098	.276	.118	CS350990T	①TKY10F	②REMX12T3EN
BOE4R404W20	●	4	2.500	2.181	1.772	5.022	1.250	1.772	.098	.276	.118	CS350990T	①TKY10F	
BOER322W20	●	2	2.000	1.539	.996	4.053	1.250	1.772	.118	.354	.155	CS501290T	②TKY25T	
BOER403W20	●	3	2.500	2.043	1.500	4.053	1.250	1.772	.118	.354	.155	CS501290T	②TKY25T	①OEMX1705E□R1
BOER504W20	●	4	3.125	2.668	2.129	4.053	1.250	1.772	.118	.354	.155	CS501290T	②TKY25T	②REMX1705□N

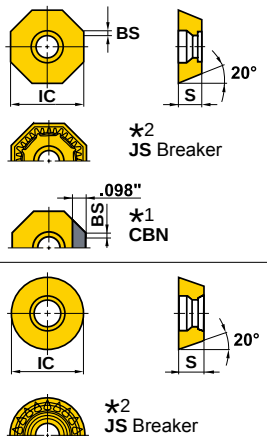
★ Clamp Torque (lbf-in) : CS350990T=22, CS501290T=66

INSERTS

Work Material		
P	Steel	● ◐ ◐ ◐
M	Stainless Steel	○ ◔ ◔ ◔
K	Cast Iron	✱ ◐
H	Hardened Materials	✱ ◐

Cutting Conditions :
● : Stable Cutting ◐ : General Cutting
✱ : Unstable Cutting
Honing :
E : Round **S** : Chamfer + Round **T** : Chamfer

Shape	Order Number	Class	Honing	Coated F7010	Coated F7030	Coated VP15TF	Cermet NX4545		CBN★1 MB835	CBN★1 MB730	Dimensions (inch) IC	S	BS	Geometry
	OEMX12T3ETR1	M	T				●		●	●	.500	.156	.039	
	OEMX12T3ETR5	M	T						●	●	.500	.156	.197	
	OEMX12T3ESR1	M	S		●						.500	.156	.039	
	★2 **OEMX12T3EER1-JS**	M	E		★						.500	.156	.039	
	OEMX1705ETR1	M	T	●		●	●				.669	.197	.055	
	OEMX1705ESR1	M	S		●						.669	.197	.055	
	★2 **OEMX1705EER1-JS**	M	E		★						.669	.197	.055	
★2 JS Breaker	★2 **OEMX1705ETR1-JS**	M	T			●					.669	.197	.055	
	★2 **REMX12T3EN-JS**	M	E		●						.500	.164	—	
	REMX1705EN	M	E		●						.679	.205	—	
★2 JS Breaker	★2 **REMX1705EN-JS**	M	E		●						.679	.205	—	



★1 Flat insert.
★2 Insert with breaker.

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case> <1 insert in one case for CBN>



Fig.1

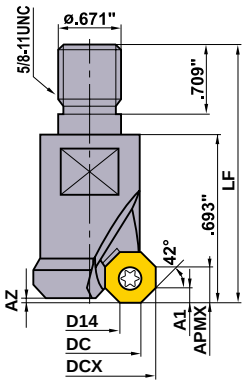


Fig.2

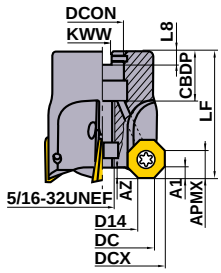


Fig.3

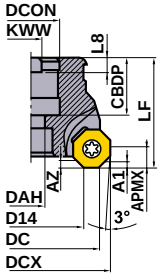
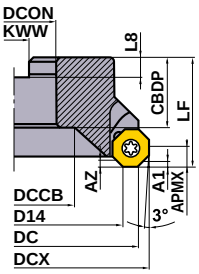


Fig.4



ARBOR TYPE

Right hand tool holder only.

Order Number	Stock R	Number of Teeth	Dimensions (inch) DCX	DC	D14	LF	DCON	CBDP	DAH	DCCB	KWW	L8	WT* (lbs)	Max. Depth of Cut A1	APMX	AZ	Type (Fig.)	Insert
BOE4R202	●	2	1.250	.925	.516	2.598	—	—	—	—	—	—	—	.098	.276	.118	1	OEMX12T3 REMX12T3
BOE4R**1503X**	●	3	1.500	1.177	.767	1.575	.750	.748	—	—	.313	.187	.5	.098	.276	.118	2	
BOE4R**0203**	●	3	2.000	1.680	1.269	1.575	.750	.748	—	—	.313	.201	.8	.098	.276	.118	2	
BOE4R**2504**	●	4	2.500	2.181	1.772	1.969	.750	.748	.415	—	.313	.201	1.3	.098	.276	.118	3	
BOE4R**0305C**	●	5	3.000	2.682	2.271	1.969	1.000	1.024	.512	—	.375	.236	2.4	.098	.276	.118	3	
BOER2503A	●	3	2.480	2.024	1.480	1.969	.750	.748	.415	—	.313	.187	1.3	.118	.354	.155	3	OEMX1705 REMX1705
BOER**0304C**	●	4	3.150	2.693	2.154	1.969	1.000	1.024	.512	—	.375	.219	3.8	.118	.354	.155	3	
BOER**0405E**	●	5	3.937	3.484	2.941	2.480	1.500	1.181	.787	—	.625	.375	6.3	.118	.354	.155	3	
BOER**0506E**	●	6	4.921	4.469	3.929	2.480	1.500	1.380	—	2.362	.625	.375	7.0	.118	.354	.155	4	
BOER**0608F**	●	8	6.300	5.846	5.307	2.480	2.000	1.496	—	3.185	.750	.437	11.4	.118	.354	.155	4	
BOER**0809F**	●	9	8.000	7.547	7.003	2.500	2.000	1.496	—	2.185	.750	.437	16.2	.118	.354	.155	4	

1) ⁎ WT : Mass
2) Set bolt not included.

SPARE PARTS

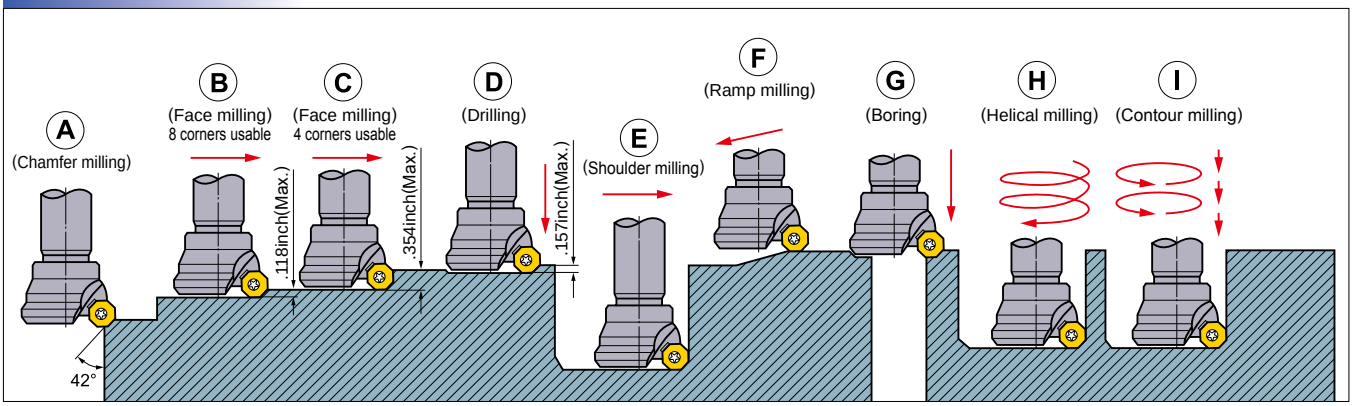
Milling Cutter No.	Insert Screw *	Wrench	Set Bolt
BOE4R202	CS350990T	①TKY10F	—
BOE4R**0203**			BOE4S06U
BOE4R**2504**			—
BOE4R**0305C**			—
BOER2503A ~ **BOER0809F**	CS501290T	②TKY25T	—

⁎ Clamp Torque (lbf-in) : CS350990T=22, CS501290T=66

MILLING

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

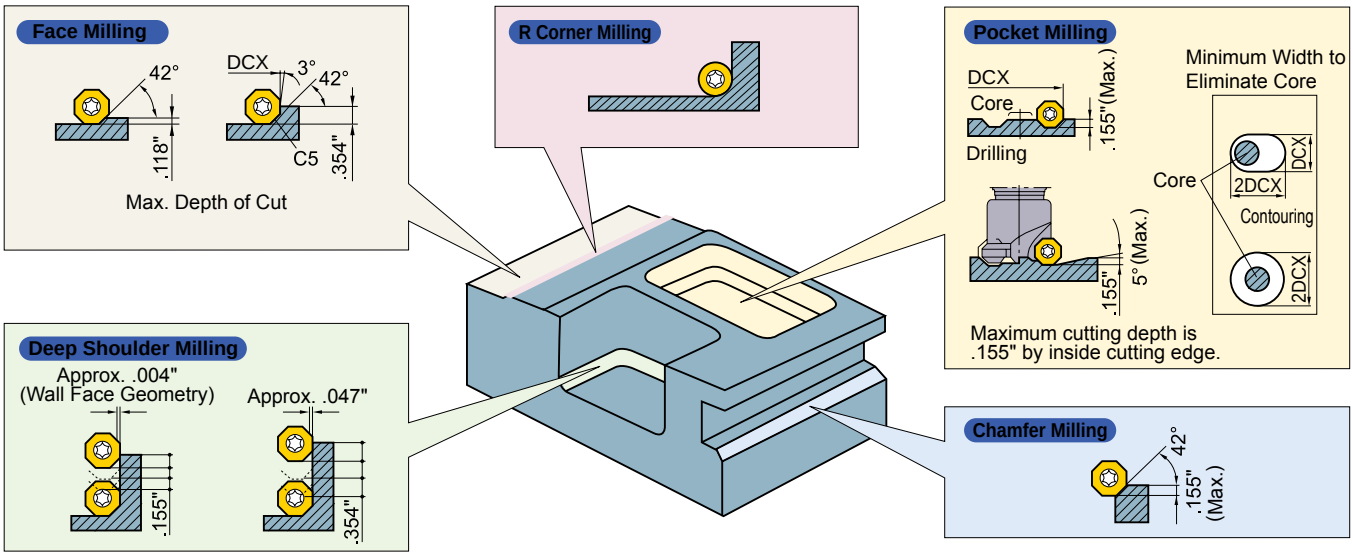


(Note) These are recommended cutting conditions when cutter diameter is less than 3.15inch. For cutters with diameter ≥ ϕ3.15inch increase cutting speed by 10%.
Above sizes are for OEMX1705 □□□□.

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Cutting Mode	Feed per Tooth (inch/tooth)
P	Mild Steel	≤180HB	**F7010**	785 (590−985)	A	.008 (.006−.010)
					B	.008 (.006−.010)
			F7030	705 (475−820)	C,E,F	.008 (.006−.010)
			VP15TF	590 (330−820)	D,G,H,I	.003 (.002−.004)
	Carbon Steel Alloy Steel	180−280HB	**F7010**	655 (460−785)	A	.008 (.006−.010)
					B	.008 (.006−.010)
			F7030	590 (390−690)	C,E,F	.008 (.006−.010)
			VP15TF	590 (330−820)	D,G,H,I	.003 (.002−.004)
		280−380HB	**F7010**	490 (330−555)	A	.008 (.006−.010)
					B	.008 (.006−.010)
			F7030	425 (295−525)	C,E,F	.008 (.006−.010)
			VP15TF	390 (260−525)	D,G,H,I	.003 (.002−.004)
	Pre-Hardened Steel	35−45HRC	**F7010**	425 (295−525)	A	.006 (.004−.008)
					B	.006 (.004−.008)
			F7030	360 (260−460)	C,E,F	.004 (.002−.006)
			VP15TF	390 (260−525)	D,G,H,I	.002 (.001−.003)
	High Alloy Steel	≤300HB	**F7010**	490 (330−555)	A	.006 (.004−.008)
					B	.006 (.004−.008)
			F7030	425 (295−525)	C,E,F	.004 (.002−.006)
			VP15TF	390 (260−525)	D,G,H,I	.002 (.001−.003)
M	Stainless Steel	≤270HB	**F7010**	655 (460−785)	A	.006 (.004−.008)
					B	.006 (.004−.008)
			F7030	590 (390−690)	C,E,F	.004 (.002−.006)
			VP15TF	490 (330−655)	D,G,H,I	.003 (.002−.004)
K	Cast Iron	Tensile Strength ≤350MPa	**VP15TF**	525 (330−720)	A	.012 (.010−.014)
					B	.010 (.008−.012)
					C,E,F	.006 (.004−.008)
					D,G,H,I	.003 (.002−.004)
			MB730	4920 (3280−9840)	B (Depth of Cut .004−.020inch)	.006 (.004−.008)
	Ductile Cast Iron	Tensile Strength 360−500MPa	**VP15TF**	525 (330−720)	A	.010 (.008−.012)
					B	.008 (.006−.010)
					C,E,F	.004 (.002−.006)
					D,G,H,I	.002 (.001−.003)
		Tensile Strength 500−800MPa	**VP15TF**	460 (295−620)	A	.010 (.008−.012)
					B	.008 (.006−.010)
					C,E,F	.004 (.002−.006)
					D,G,H,I	.002 (.001−.003)
H	Heat-Treated Steel	45−60HRC	**VP15TF**	260 (165−330)	A	.006 (.004−.008)
					B	.006 (.004−.008)
					C,E,F	.004 (.002−.005)
					D,G,H,I	.002 (.001−.002)
			MB835	490 (330−655)	B (Depth of Cut .004−.012inch)	.006 (.004−.008)

(Note 1) This list of recommended cutting conditions is for flank wear of .012 inch in 30min. cutting time.
(Note 2) More than 2 inch shank length should be clamped in the milling chuck.
(Note 3) Use peck feed when drilling. (.020inch step is recommended)
(Note 4) When chattering occurs, reduce cutting speed to 70−80%.
(Note 5) When using round inserts, make sure that the flat portion of the flank surface is secure against the insert seat wall.

APPLICATION



Above sizes are for OEMX1705□□□□.

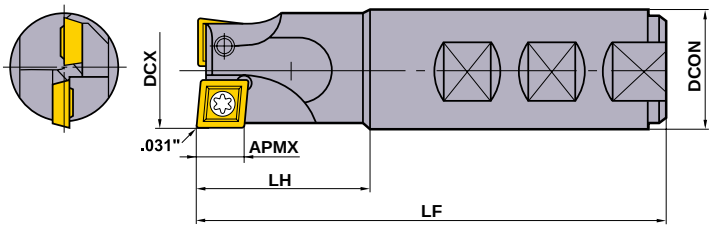
MULTI FUNCTIONAL MILLING

Roughing

ECMP

P M K N S H





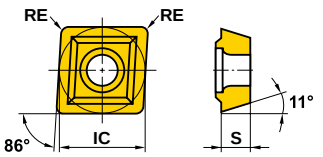
- Unique insert seat position facilitates smooth initial cutting and stable machining.
- Excellent chip disposal.
- 86°rhombic shape 11°positive insert.

Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (inch)				APMX	✶		
	R		DCX	LF	DCON	LH		Insert Screw	Wrench	Insert
ECMPR162W16	●	2	1.000	4.500	1.000	1.250	.315	TS4	TKY15R	MPMM322
ECMPR202W20	●	2	1.250	5.000	1.250	1.750	.433	TS5	TKY25R	MPMM432
ECMPR242W20	●	2	1.500	6.562	1.250	3.313	.433	TS5	TKY25R	MPMM432

✶ Clamp Torque (lbf-in) : TS4=31, TS5=66

INSERTS

Shape	Order Number	ISO Number	Class	Coated	Carbide	Dimensions (inch)			Geometry
				VP15TF	UTi20T	IC	S	RE	
	**MPMM322**	**MPMT090308**	M	★	●	.375	.125	.031	
	MPMM432	**MPMT120408**	M		●	.500	.1875	.031	

RECOMMENDED CUTTING CONDITIONS

(Note) Feed per Tooth (inch/tooth) or Feed per Revolution (inch/rev)

ECMPR162W16

	Work Material	Hardness	Grade	Outer Peripheral Edge Cutting (inch/tooth) Cutting Speed : 260–400 SFM				Bottom Cutting Edge Machining (inch/rev) (Drilling, Boring) Cutting Speed : 200–330 SFM
				Depth of Cut .080"	Depth of Cut .160"	Depth of Cut .240"	Depth of Cut .320"	
P	Mild Steel	≤180HB	**UTi20T**	.004–.010	.004–.008	.004–.006	.004–.006	.004–.006
	Carbon Steel • Alloy Steel	280–350HB	**UTi20T**	.004–.008	.004–.006	.002–.004	.002–.004	.003–.005
K	Cast Iron	Tensile Strength ≤450MPa	**UTi20T**	.004–.012	.004–.010	.004–.008	.004–.006	.004–.006

ECMPR202W20, ECMP242W20

	Work Material	Hardness	Grade	Outer Peripheral Edge Cutting (inch/tooth) Cutting Speed : 260–400 SFM					Bottom Cutting Edge Machining (inch/rev) (Drilling, Boring) Cutting Speed : 200–330 SFM
				Depth of Cut .080"	Depth of Cut .160"	Depth of Cut .240"	Depth of Cut .320"	Depth of Cut .400"	
P	Mild Steel	≤180HB	**UTi20T**	.004–.012	.004–.010	.004–.008	.004–.006	.004–.006	.005–.006
	Carbon Steel • Alloy Steel	280–350HB	**UTi20T**	.004–.010	.004–.008	.004–.006	.002–.006	.002–.004	.004–.006
K	Cast Iron	Tensile Strength ≤450MPa	**UTi20T**	.004–.016	.004–.012	.004–.010	.004–.008	.004–.008	.004–.008

PRECAUTIONS IN USING ECMP

1. Higher than recommended data may be used if depth of cut is small and peripheral cutting is operation.
2. When bottom cutting use coolant.

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

CHAMFER MILLING

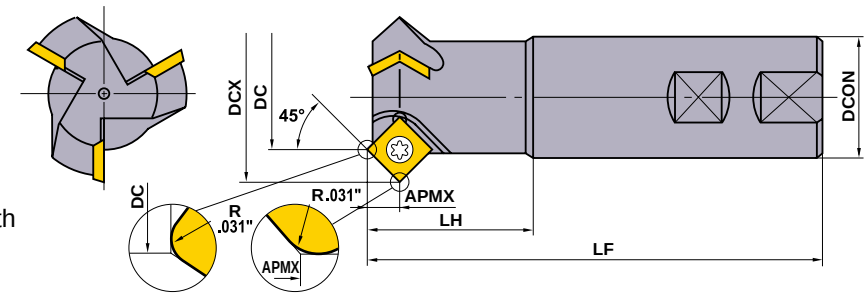
45° Roughing

CFSP

P M K N S H



- Excellent sharpness with 11°positive inserts.
- 45°chamfer series.



Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (inch)						*		
	R		DC	DCX	LF	DCON	LH	APMX	Insert Screw	Wrench	Insert
CFSPR051W16	●	1	.313	.964	4.000	1.000	1.719	.327	TS52	TKY25R	SPMW42
CFSPR**101W16**	●	1	.625	1.280	4.000	1.000	1.719	.327	TS5	TKY25R	SPMW42
CFSPR**203W20**	●	3	1.250	1.905	4.125	1.250	1.844	.327	TS5	TKY25R	SPMW42

* Clamp Torque (lbf-in) : TS52=66, TS5=66

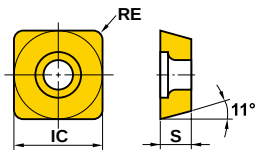
INSERTS

Work Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron

Cutting Conditions :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Shape	Order Number	ISO Number	Class	Coated			Cermet		Carbide		Dimensions (inch)			Geometry
				VP15TF	UP20M		NX2525	NX4545	UTi20T	HTi10	IC	S	RE	
	SPMW421	**SPMW120304**	M	●	●		★	★	●	●	.500	.125	.016	
	SPMW**422**	SPMW**120308**	M	●	●		★	★	●	●	.500	.125	.031	





RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed per Tooth (inch/tooth)	
					Chamfer Milling	Face Milling
P	Carbon Steel Alloy Steel	180—280HB	**UTi20T**	590 (425—720)	.016	.006
			UP20M	590 (425—720)	.016	.008
			NX2525	590 (425—720)	.016	.008
		280—350HB	**UTi20T**	330 (230—395)	.012	.006
K	Cast Iron	Tensile Strength ≤450MPa	**UTi20T**	460 (330—560)	.020	.004
			HTi10	460 (330—560)	.020	.004

MILLING

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

BALL NOSE END MILL

Finishing

Including curved faces

SRF

P M K N S H



Fig. 1

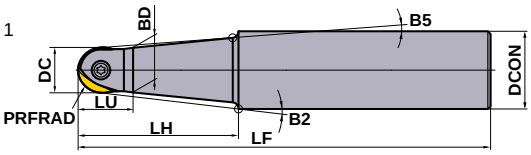


Fig. 2

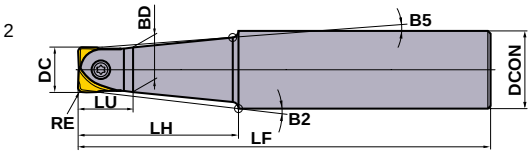


Fig. 3

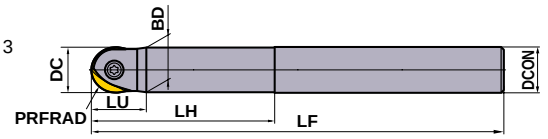


Fig. 4

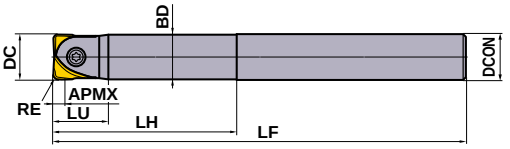


Fig. 5

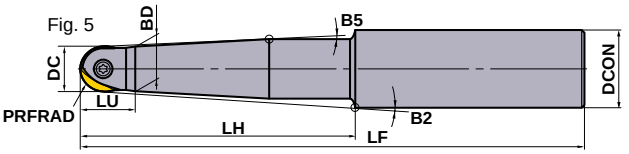
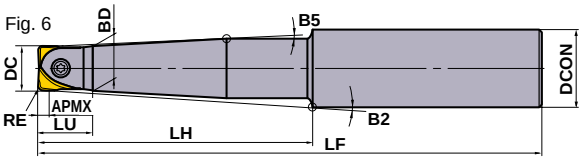


Fig. 6



Right hand tool holder only.
Refer to page K142 for APMX, PRFRAD&RE.

STEEL SHANK

Type	Order Number	Stock R	Inserts	Dimensions (inch) PRFRAD	DC	DCON	LF	BD	LH	LU	B2	B5	Fig.	* Clamp Screw	① ② Wrench	Anti-seize Lubricant
Standard	SRFU06S08M	●	SRFT0375	.1875	.375	.500	4.375	.354	1.625	512	2°30'	1°30'	1	RS3008TS	① TKY08D	MK1KS
			SRFT10	.1969	.394						2°08'	1°30'	1			
			SUFT10R□□	—	.394						2°08'	1°30'	2			
	SRFU08S10M	●	SRFT0500	.2500	.500	.625	4.750	.453	2.000	.591	2°03'	1°30'	1	RS3510T	① TKY10D	MK1KS
			SRFT12	.2362	.472						2°29'	1°30'	1			
			SUFT12R□□	—	.472						2°29'	1°30'	2			
	SRFU10S12M	●	SRFT0625	.3125	.625	.750	5.125	.606	2.000	.787	2°07'	1°30'	1	RS4015T	② TKY15T	MK1KS
			SRFT16	.3150	.630						2°02'	1°30'	1			
			SUFT16R□□	—	.630						2°02'	1°30'	2			
	SRFU12S16M	●	SRFT0750	.3750	.750	1.000	6.000	.732	2.875	.945	2°52'	1°30'	1	RS5020T	② TKY20T	MK1KS
			SRFT20	.3937	.787						2°27'	1°30'	1			
			SUFT20R□□	—	.787						2°27'	1°30'	2			
	SRFU16S20M	●	SRFT1000	.5000	1.000	1.250	7.125	.965	3.250	1.181	2°36'	1°30'	1	RS6025T	② TKY25T	MK1KS
			SRFT25	.4921	.984						2°46'	1°30'	1			
			SUFT25R□□	—	.984						2°46'	1°30'	2			
	SRFU20S20M	●	SRFT1250	.6250	1.250	1.250	8.039	1.161	4.164	1.417	—	—	3	RS8030T	② TKY30T	MK1KS
			SRFT30	.5906	1.181		8.000		4.125	1.378			3			
			SRFT32	.6299	1.260		8.039		4.164	1.417			3			
			SUFT30R□□	—	1.181		8.000		4.125	1.378			4			
Long	SRFU06S08L	●	SRFT0375	.1875	.375	.500	6.000	.354	2.500	.512	1°33'	1°30'	1	RS3008TS	① TKY08D	MK1KS
			SRFT10	.1969	.394						1°19'	1°30'	1			
			SUFT10R□□	—	.394						1°19'	1°30'	2			
	SRFU08S10L	●	SRFT0500	.2500	.500	.625	6.375	.453	2.875	.591	1°22'	1°30'	1	RS3510T	① TKY10D	MK1KS
			SRFT12	.2362	.472						1°39'	1°30'	1			
			SUFT12R□□	—	.472						1°39'	1°30'	2			
	SRFU10S12L	●	SRFT0625	.3125	.625	.750	7.125	.606	3.625	.787	1°05'	1°30'	5	RS4015T	② TKY15T	MK1KS
			SRFT16	.3150	.630						1°02'	1°30'	5			
			SUFT16R□□	—	.630						1°02'	1°30'	6			
	SRFU12S16L	●	SRFT0750	.3750	.750	1.000	8.500	.732	4.625	.945	1°41'	1°30'	1	RS5020T	② TKY20T	MK1KS
			SRFT20	.3937	.787						1°25'	1°30'	1			
			SUFT20R□□	—	.787						1°25'	1°30'	2			
	SRFU16S20L	●	SRFT1000	.5000	1.000	1.250	9.625	.965	5.750	1.181	1°22'	1°30'	1	RS6025T	② TKY25T	MK1KS
			SRFT25	.4921	.984						1°27'	1°30'	1			
			SUFT25□□	—	.984						1°27'	1°30'	2			
	SRFU20S20L	●	SRFT1250	.6250	1.250	1.250	10.539	1.161	6.664	1.417	—	—	3	RS8030T	② TKY30T	MK1KS
			SRFT30	.5906	1.181		10.500		6.625	1.378			3			
			SRFT32	.6299	1.260		10.539		6.664	1.417			3			
			SUFT30□□	—	1.181		10.500		6.625	1.378			4			

(Note) Fit inserts in the right direction. (Refer to page K144 & K145)

* Clamp Torque (lbf-in) : RS3008TS=13, RS3510T=22, RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88

● : **Inventory maintained.**

<2 inserts in one case>



Fig. 1

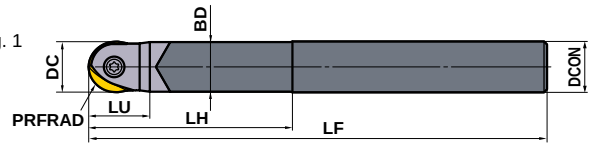
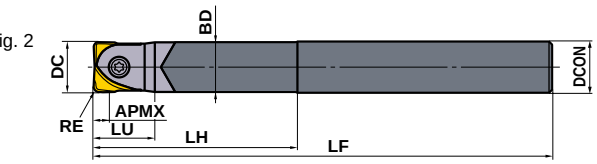


Fig. 2



CARBIDE SHANK

Right hand tool holder only.
Refer to page K142 for APMX, PRFRAD&RE.

Type	Order Number	Stock R	Inserts	Dimensions (inch) PRFRAD	DC	DCON	LF	BD	LH	LU	Fig.	* Clamp Screw	①② Wrench	Anti-seize Lubricant
Standard	**SRFU06S06MW**	●	SRFT0375	.1875	.375	.375	4.375	.354	1.625	0.512	1	RS3008TS	①TKY08D	MK1KS
			SRFT10	.1969	.394						1			
			SUFT10R○○	—	.394						2			
	SRFU**08S08MW**	●	SRFT0500	.2500	.500	.500	4.750	.453	2.000	0.591	1	RS3510T	①TKY10D	MK1KS
			SRFT12	.2362	.472						1			
			SUFT12R○○	—	.472						2			
	SRFU**10S10MW**	●	SRFT0625	.3125	.625	.625	5.250	.606	2.125	0.787	1	RS4015T	②TKY15T	MK1KS
			SRFT16	.3150	.630						1			
			SUFT16R○○	—	.630						2			
	SRFU**12S12MW**	●	SRFT0750	.3750	.750	.750	7.125	.732	4.000	0.945	1	RS5020T	②TKY20T	MK1KS
			SRFT20	.3937	.787						1			
			SUFT20R○○	—	.787						2			
	SRFU**16S16MW**	●	SRFT1000	.5000	1.000	1.000	8.000	.965	4.125	1.181	1	RS6025T	②TKY25T	MK1KS
			SRFT25	.4921	.984						1			
			SUFT25R○○	—	.984						2			
Long	**SRFU06S06LW**	●	SRFT0375	.1875	.375	.375	6.625	.354	3.125	.512	1	RS3008TS	①TKY08D	MK1KS
			SRFT10	.1969	.394						1			
			SUFT10R○○	—	.394						2			
	SRFU**08S08LW**	●	SRFT0500	.2500	.500	.500	6.625	.453	3.125	.591	1	RS3510T	①TKY10D	MK1KS
			SRFT12	.2362	.472						1			
			SUFT12R○○	—	.472						2			
	SRFU**10S10LW**	●	SRFT0625	.3125	.625	.625	8.000	.606	4.500	.787	1	RS4015T	②TKY15T	MK1KS
			SRFT16	.3150	.630						1			
			SUFT16R○○	—	.630						2			
	SRFU**12S12LW**	●	SRFT0750	.3750	.750	.750	10.000	.732	6.125	.945	1	RS5020T	②TKY20T	MK1KS
			SRFT20	.3937	.787						1			
			SUFT20R○○	—	.787						2			
	SRFU**16S16LW**	●	SRFT1000	.5000	1.000	1.000	12.000	.965	8.125	1.181	1	RS6025T	②TKY25T	MK1KS
			SRFT25	.4921	.984						1			
			SUFT25R○○	—	.984						2			

(Note) Fit inserts in the right direction. (Refer to page K144 & K145)

* Clamp Torque (lbf-in) : RS3008TS=13, RS3510T=22, RS4015T=29, RS5020T=44, RS6025T=66

INSERTS ➤ K142
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig. 1

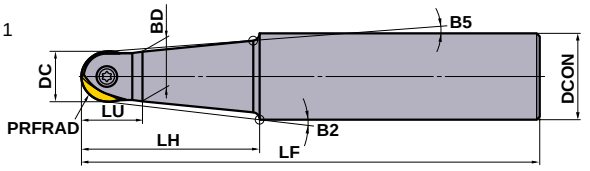


Fig. 2

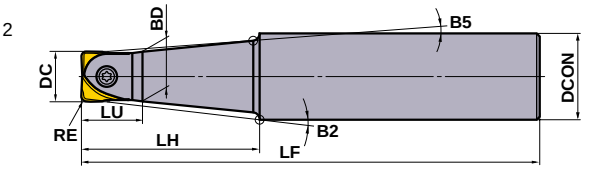


Fig. 3

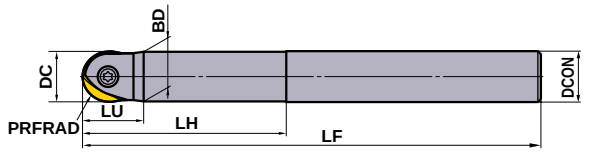


Fig. 4

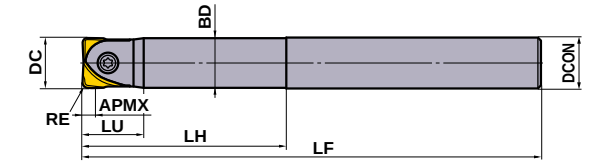


Fig. 5

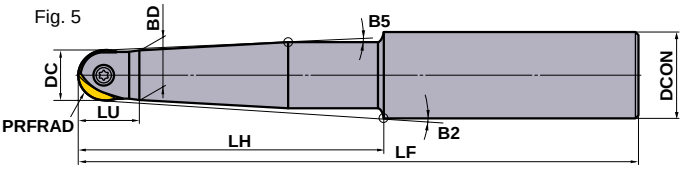
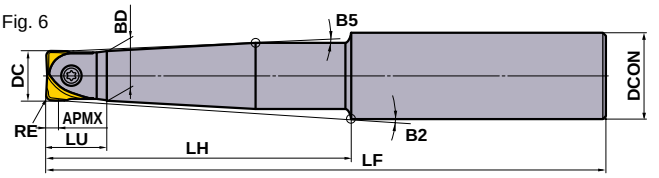


Fig. 6



METRIC Standard

STEEL SHANK

Right hand tool holder only.
Refer to page K142 for APMX, PRFRAD&RE.

Type	Order Number	Stock R	Inserts	PRFRAD	DC	DCON	LF	BD	LH	LU	B2	B5	Fig.	Clamp Screw *	Wrench ①②	Anti-seize Lubricant
Standard	SRFH10S12M	★	SRFT10	5	10	12	110	9.5	40	13	1°38′	1°30′	1	RS3008T	①TKY08D	MK1KS
			SUFT10R◌◌	—	10	12	110	9.5	40	13	1°38′	—	2			
	SRFH12S16M	★	SRFT12	6	12	16	120	11.5	50	15	2°36′	1°30′	1	RS3510T	①TKY10D	MK1KS
			SUFT12R◌◌	—	12	16	120	11.5	50	15	2°36′	—	2			
	SRFH16S20M	★	SRFT16	8	16	20	130	15.5	50	20	2°44′	1°30′	1	RS4015T	②TKY15T	MK1KS
			SUFT16R◌◌	—	16	20	130	15.5	50	20	2°44′	—	2			
	SRFH20S25M	★	SRFT20	10	20	25	150	19.5	70	24	2°23′	1°30′	1	RS5020T	②TKY20T	MK1KS
			SUFT20R◌◌	—	20	25	150	19.5	70	24	2°23′	1°30′	2			
	SRFH25S32M	★	SRFT25	12.5	25	32	180	24.5	80	30	2°58′	1°30′	1	RS6025T	②TKY25T	MK1KS
			SUFT25R◌◌	—	25	32	180	24.5	80	30	2°58′	1°30′	2			
	SRFH30S32M	★	SRFT30	15	30	32	200	29.5	100	35	—	—	3	RS8030T	②TKY30T	MK1KS
			SUFT30R◌◌	—	30	32	200	29.5	100	35	—	—	4			
	SRFH32S32M	★	SRFT32	16	32	32	200	31.5	100	35	—	—	3	RS8030T	②TKY30T	MK1KS
			SUFT32R◌◌	—	32	32	200	31.5	100	35	—	—	4			
Semi Long	SRFH10S12L	★	SRFT10	5	10	12	150	9.5	60	13	1°30′	1°30′	1	RS3008T	①TKY08D	MK1KS
			SUFT10R◌◌	—	10	12	150	9.5	60	13	1°30′	—	2			
	SRFH12S16L	★	SRFT12	6	12	16	160	11.5	70	15	1°47′	1°30′	1	RS3510T	①TKY10D	MK1KS
			SUFT12R◌◌	—	12	16	160	11.5	70	15	1°47′	—	2			
	SRFH16S20L	★	SRFT16	8	16	20	160	15.5	70	20	1°51′	1°30′	1	RS4015T	②TKY15T	MK1KS
			SUFT16R◌◌	—	16	20	160	15.5	70	20	1°51′	—	2			
	SRFH20S25L	★	SRFT20	10	20	25	180	19.5	80	24	2°03′	1°30′	1	RS5020T	②TKY20T	MK1KS
			SUFT20R◌◌	—	20	25	180	19.5	80	24	2°03′	1°30′	2			
	SRFH20S20L80	★	SRFT20	10	20	20	180	19.5	80	24	—	—	3	RS5020T	②TKY20T	MK1KS
			SUFT20R◌◌	—	20	20	180	19.5	80	24	—	—	4			
	SRFH25S32L	★	SRFT25	12.5	25	32	200	24.5	100	30	2°17′	1°30′	1	RS6025T	②TKY25T	MK1KS
			SUFT25R◌◌	—	25	32	200	24.5	100	30	2°17′	1°30′	2			
	SRFH25S25L100	★	SRFT25	12.5	25	25	200	24.5	100	30	—	—	3	RS6025T	②TKY25T	MK1KS
			SUFT25R◌◌	—	25	25	200	24.5	100	30	—	—	4			
	SRFH30S32L	★	SRFT30	15	30	32	230	29.5	130	35	—	—	3	RS8030T	②TKY30T	MK1KS
			SUFT30R◌◌	—	30	32	230	29.5	130	35	—	—	4			

(Note 1) Fit inserts in the right direction. (Refer to page K144 & K145)
(Note 2) Inch type insert can not be installed on the metric holder.
★ Clamp Torque (lbf-in) : RS3008T=13, RS3510T=22, RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88

★ : Inventory maintained in Japan.

Type	Order Number	Stock	Inserts	Dimensions (mm)									Fig.	★ Clamp Screw	①② Wrench	Anti-seize Lubricant
		R		PRFRAD	DC	DCON	LF	BD	LH	LU	B2	B5				
Long	**SRFH20S25E**	★	SRFT20	10	20	25	220	19.5	120	24	1°30′	1°30′	5	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	25	220	19.5	120	24	1°30′	1°30′	6			
	SRFH**20S20E120**	★	SRFT20	10	20	20	220	19.5	120	24	—	—	3	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	20	220	19.5	120	24	—	—	4			
	SRFH**25S32E**	★	SRFT25	12.5	25	32	250	24.5	150	30	1°30′	1°30′	5	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	32	250	24.5	150	30	1°30′	1°30′	6			
	SRFH**25S25E150**	★	SRFT25	12.5	25	25	250	24.5	150	30	—	—	3	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	25	250	24.5	150	30	—	—	4			
	SRFH**30S32E**	★	SRFT30	15	30	32	300	29.5	200	35	—	—	3	RS8030T	②TKY30T	MK1KS
			SUFT30R○○	—	30	32	300	29.5	200	35	—	—	4			

(Note 1) Fit inserts in the right direction. (Refer to page K144 & K145)
(Note 2) Inch type insert can not be installed on the metric holder.
★ Clamp Torque (lbf-in) : RS5020T=44, RS6025T=66, RS8030T=88

INSERTS ➤ K142
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig. 1

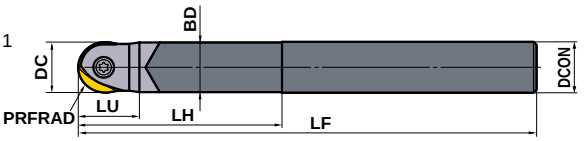
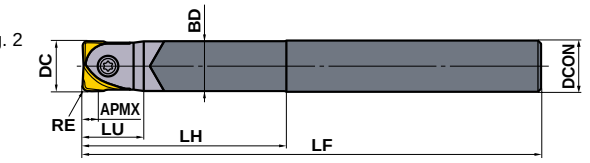


Fig. 2



METRIC Standard

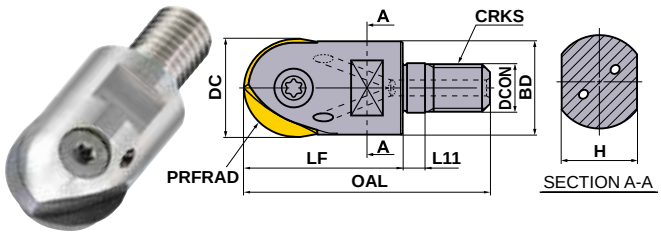
CARBIDE SHANK

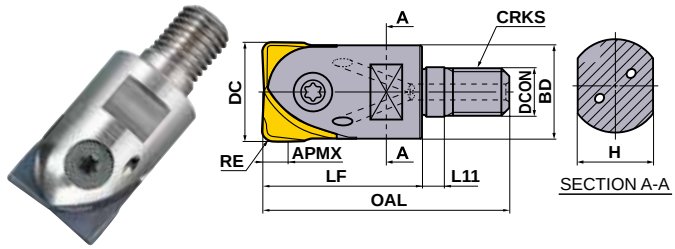
Right hand tool holder only.
Refer to page K142 for APMX, PRFRAD&RE.

Type	Order Number	Stock	Inserts	Dimensions (mm)							Fig.	* Clamp Screw	①② Wrench	Anti-seize Lubricant
		R		PRFRAD	DC	DCON	LF	BD	LH	LU				
Standard	**SRFH10S10MW**	★	SRFT10	5	10	10	110	9.5	40	13	1	RS3008T	①TKY08D	MK1KS
			SUFT10R○○	—	10	10	110	9.5	40	13	1			
	SRFH**12S12MW**	★	SRFT12	6	12	12	120	11.5	50	15	1	RS3510T	①TKY10D	MK1KS
			SUFT12R○○	—	12	12	120	11.5	50	15	1			
	SRFH**16S16MW**	★	SRFT16	8	16	16	130	15.5	50	20	1	RS4015T	②TKY15T	MK1KS
			SUFT16R○○	—	16	16	130	15.5	50	20	1			
	SRFH**20S20MW**	★	SRFT20	10	20	20	180	19.5	80	24	1	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	20	180	19.5	80	24	2			
	SRFH**25S25MW**	★	SRFT25	12.5	25	25	200	24.5	100	30	1	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	25	200	24.5	100	30	2			
	SRFH**30S32MW**	★	SRFT30	15	30	32	230	29.5	130	35	1	RS8030T	②TKY30T	MK1KS
			SRFT32	16	32	32	231	29.5	131	36				
			SUFT30R○○	—	32	32	230	29.5	130	35	2			
Long	**SRFH10S10LW**	★	SRFT10	5	10	10	150	9.5	60	13	1	RS3008T	①TKY08D	MK1KS
			SUFT10R○○	—	10	10	150	9.5	60	13	1			
	SRFH**12S12LW**	★	SRFT12	6	12	12	160	11.5	70	15	1	RS3510T	①TKY10D	MK1KS
			SUFT12R○○	—	12	12	160	11.5	70	15	1			
	SRFH**16S16LW**	★	SRFT16	8	16	16	160	15.5	70	20	1	RS4015T	②TKY15T	MK1KS
			SUFT16R○○	—	16	16	160	15.5	70	20	1			
	SRFH**16S16EW**	★	SRFT16	8	16	16	200	15.5	110	20	1	RS4015T	②TKY15T	MK1KS
	SRFH**20S20LW**	★	SRFT20	10	20	20	250	19.5	150	24	1	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	20	250	19.5	150	24	2			
	SRFH**25S25LW**	★	SRFT25	12.5	25	25	300	24.5	200	30	1	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	25	300	24.5	200	30	2			
	SRFH**30S32LW**	★	SRFT30	15	30	32	350	29.5	250	35	1	RS8030T	②TKY30T	MK1KS
			SRFT32	16	32	32	351	29.5	251	36				
			SUFT30R○○	—	30	32	350	29.5	250	35	2			

(Note 1) Fit inserts in the right direction. (Refer to page K144 & K145)
(Note 2) Inch type insert can not be installed on the metric holder.
★ Clamp Torque (lbf-in) : RS3008T=13, RS3510T=22, RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88

★ : Inventory maintained in Japan.





METRIC Standard

SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock	Coolant Hole ✶1	Insert	Dimensions (mm)									✶3 WT	✶2 Clamp Screw	Wrench	Anti-seize Lubricant
	R			PRFRAD	DC	DCON	BD	OAL	LF	L11	H	CRKS	(kg)			
SRFH16AM0830	★	Y	SRFT16	8	16	8.5	14.9	48	30	6	10	M8	0.1	RS4015T	TKY15T	MK1KS
			SUFT16R○○	—	16	8.5	14.9	48	30	6	10	M8				
SRFH**20AM1035**	★	Y	SRFT20	10	20	10.5	18.4	54	35	6	14	M10	0.1	RS5020T	TKY20T	MK1KS
			SUFT20R○○	—	20	10.5	18.4	54	35	6	14	M10				
SRFH**25AM1240**	★	Y	SRFT25	12.5	25	12.5	23.5	62	40	6	19	M12	0.1	RS6025T	TKY25T	MK1KS
			SUFT25R○○	—	25	12.5	25.5	62	40	6	19	M12				
SRFH**30AM1645**	★	Y	SRFT30	15	30	17	28.1	68	45	6	24	M16	0.2	RS8030T	TKY30T	MK1KS
			SRFT32	16	32	17	28.1	69	46	6	24	M16	0.2			
			SUFT30R○○	—	32	17	28.1	69	46	6	24	M16				

(Note 1) Fit inserts in the right direction. (Refer to page K144 & K145)
(Note 2) Inch type insert can not be installed on the metric holder.

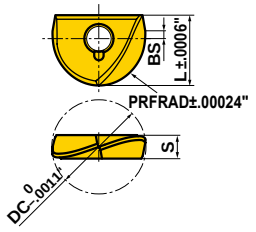
✶1 Y=Yes
✶2 Clamp Torque (lbf-in) : RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88
✶3 WT : Mass

MILLING

INSERTS ➤ K142
SCREW-IN ARBORS ➤ K162
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

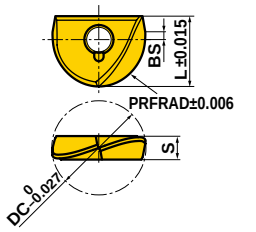
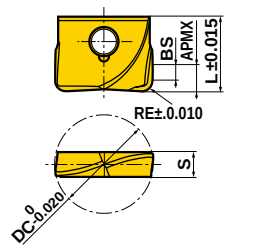
INSERTS

INCH Standard

Shape	Order Number	Coated MP8010	Coated EP6120 (NEW)	Coated VP15TF	DC	PRFRAD	RE	L	BS	S	APMX	Geometry
	SRFT0375	●	●	●	.375	.1875	—	.335	.020	.102	—	
	SRFT0500	●	●	●	.500	.2500	—	.394	.020	.118	—	
	SRFT0625	●	●	●	.625	.3125	—	.472	.039	.158	—	
	SRFT0750	●	●	●	.750	.3750	—	.591	.039	.197	—	
	SRFT1000	●	●	●	1.000	.5000	—	.728	.039	.236	—	
	SRFT1250	●	●	●	1.250	.6250	—	.925	.039	.276	—	

METRIC Standard

■ = MIRACLE SIGMA

Shape	Order Number	Coated MP8010	Coated EP6120 (NEW)	Coated VP15TF	DC	PRFRAD	RE	L	BS	S	APMX	Geometry
	SRFT10	★	★	★	10	5 (.1969")	—	8.5	0.5	2.6	—	
	SRFT12	★	★	★	12	6 (.2362")	—	10	0.5	3	—	
	SRFT16	★	★	★	16	8 (.3150")	—	12	1	4	—	
	SRFT20	★	★	★	20	10 (.3937")	—	15	1	5	—	
	SRFT25	★	★	★	25	12.5 (.4921")	—	18.5	1	6	—	
	SRFT30	★	★	★	30	15 (.5906")	—	22.5	1	7	—	
	SRFT32	★	★	★	32	16 (.6299")	—	23.5	1	7	—	
	SUFT10R05	★	★	★	10	—	0.5 (.0197")	8.5	1	2.6	1.5	
	SUFT10R10	★	★	★	10	—	1 (.0394")	8.5	1	2.6	2	
	SUFT10R20	★	★	★	10	—	2 (.0787")	8.5	1	2.6	3	
	SUFT12R05	★	★	★	12	—	0.5 (.0197")	10	1.2	3	1.7	
	SUFT12R10	★	★	★	12	—	1 (.0394")	10	1.2	3	2.2	
	SUFT12R20	★	★	★	12	—	2 (.0787")	10	1.2	3	3.2	
	SUFT12R30	★	★	★	12	—	3 (.1181")	10	1.2	3	4.2	
	SUFT16R05	★	★	★	16	—	0.5 (.0197")	12	1.6	4	2.1	
	SUFT16R10	★	★	★	16	—	1 (.0394")	12	1.6	4	2.6	
	SUFT16R15	★	★	★	16	—	1.5 (.0591")	12	1.6	4	3.1	
	SUFT16R20	★	★	★	16	—	2 (.0787")	12	1.6	4	3.6	
	SUFT16R30	★	★	★	16	—	3 (.1181")	12	1.6	4	4.6	
	SUFT20R05	★	★	★	20	—	0.5 (.0197")	15	2	5	2.5	
	SUFT20R10	★	★	★	20	—	1 (.0394")	15	2	5	3	
	SUFT20R15	★	★	★	20	—	1.5 (.0591")	15	2	5	3.5	
	SUFT20R20	★	★	★	20	—	2 (.0787")	15	2	5	4	
	SUFT20R30	★	★	★	20	—	3 (.1181")	15	2	5	5	
	SUFT25R05	★	★	★	25	—	0.5 (.0197")	18.5	2.5	6	3	
	SUFT25R10	★	★	★	25	—	1 (.0394")	18.5	2.5	6	3.5	
	SUFT25R20	★	★	★	25	—	2 (.0787")	18.5	2.5	6	4.5	
	SUFT25R30	★	★	★	25	—	3 (.1181")	18.5	2.5	6	5.5	
	SUFT30R05	★	★	★	30	—	0.5 (.0197")	22.5	3	7	3.5	
	SUFT30R10	★	★	★	30	—	1 (.0394")	22.5	3	7	4	
	SUFT30R20	★	★	★	30	—	2 (.0787")	22.5	3	7	5	
	SUFT30R30	★	★	★	30	—	3 (.1181")	22.5	3	7	6	
	SUFT32R05	★	★	★	32	—	0.5 (.0197")	23.5	3.2	7	3.7	
	SUFT32R10	★	★	★	32	—	1 (.0394")	23.5	3.2	7	4.2	
	SUFT32R20	★	★	★	32	—	2 (.0787")	23.5	3.2	7	5.2	

■ = MIRACLE SIGMA

● : Inventory maintained. ★ : Inventory maintained in Japan.
<2 inserts in one case>

RECOMMENDED CUTTING CONDITIONS FOR SRFT BALL-NOSE INSERTS

	Work Material	Hardness	Insert Grades	Cutting Speed **vc** (SFM)	Feed per Tooth **fz** (IPT)	Depth of Cut **ap** (inch)
P	Mild Steel	180HB	**EP6120**	655 (260—985)	.008 (.004—.012)	≤0.05DC
P	Carbon Steel Alloy Steel	180—280HB	**EP6120**	655 (260—985)	.008 (.004—.012)	≤0.05DC
P			**VP15TF**	655 (260—985)	.008 (.004—.012)	≤0.05DC
P		280—350HB	**EP6120**	655 (260—985)	.008 (.004—.012)	≤0.05DC
P	Pre-hardened steels	35—45HRC	**EP6120**	490 (260—655)	.008 (.004—.012)	≤0.05DC
P			**VP15TF**	490 (260—655)	.008 (.004—.012)	≤0.05DC
P	Alloy Tool Steel	350HB	**EP6120**	490 (260—655)	.008 (.004—.012)	≤0.05DC
P			**VP15TF**	490 (260—655)	.008 (.004—.012)	≤0.05DC
K	Gray Cast Iron	350MPa	**MP8010**	820 (260—1475)	.008 (.004—.012)	≤0.05DC
K	Ductile Cast Iron	450MPa	**MP8010**	655 (260—985)	.008 (.004—.012)	≤0.05DC
K		800MPa	**MP8010**	655 (260—985)	.008 (.004—.012)	≤0.05DC
N	Copper,Copper Alloys		**EP6120**	655 (260—985)	.008 (.004—.012)	≤0.05DC
H	Hardened Steel	45—55HRC	**MP8010**	330 (195—395)	.008 (.004—.012)	≤0.05DC
H		55—65HRC	**MP8010**	260 (195—395)	.008 (.004—.012)	≤0.01DC

(Note 1) The values above are for average machining conditions. The optimum values can change slightly according to the condition and rigidity of the machine and work holding. Adjust the values accordingly.
(Note 2) For end mills with a carbide shank, up to 20 percent higher cutting conditions are possible.
(Note 3) Please note the following when machining hardened steel with MP8010.
- Please shorten the overhang length as much as possible.
- Use with carbide shank recommended.
- Take special care with the depth of cut to prevent fracture.

CALCULATING ACTUAL CUTTING SPEED

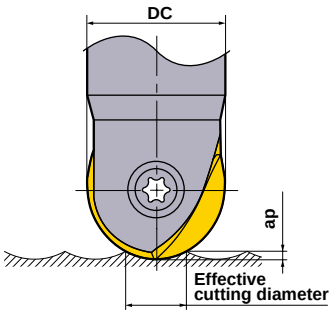
1. Effective cutting diameter = $2\sqrt{ap\ (DC-ap)}$

DC: Tool diameter (inch)
ap : Depth of Cut (inch)

2. Using ap ➡ Calculate cutting speed at the depth of cut line.

$$vc = \frac{2\pi n\sqrt{ap(DC-ap)}}{12}$$

vc : Actual cutting speed (SFM)
n : Revolution (min^{-1})



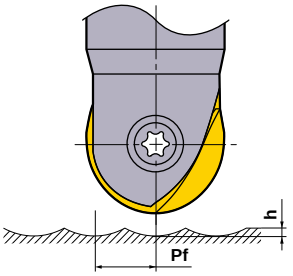
SELECTING PICK FEED

Theoretical $h = \frac{(Pf)^2}{8R}$

h : Cusp height
pf : Pick feed
PRFRAD : Ball nose or corner radius

Actual surface roughness Rz will be about 3 times worse than theoretical h.
This is because of the effect of a built-up edge.
To determine Pf, use the formula below based on a particular Rz value.

$$Pf = \sqrt{\frac{8xPRFRADxRz}{3}}$$



INSERT INSTALLATION

1. Clean the insert and the insert pocket

Thoroughly clean the insert and the insert pocket on the holder body.

2. Fitting the insert

Place the concave mark on the insert uppermost as shown with the clamp screw inserted from above. Fasten the clamp screw while firmly pressing the insert against the insert pocket wall. Use of a special anti seize lubricant MK1KS is recommended. Tighten at the recommended torque range.



RECOMMENDED CUTTING CONDITIONS FOR SUFT CORNER RADIUS INSERT

Shoulder milling(When small width of cut.*)

	Work Material	Hardness	Insert Grades	Cutting Speed **vc** (SFM)	Depth of Cut **ap** (inch)	Wide of Cut **ae** (inch)	Feed per Tooth **fz** (IPT)
P	Carbon Steel Alloy Steel	180−280HB	**VP15TF**	655 (260−985)	≤0.05DC	≤0.05DC	.008 (≤.016)
	Pre-hardened steels	≤45HRC	**VP15TF**	490 (260−655)	≤0.05DC	≤0.05DC	.006 (≤.012)
	Alloy Tool Steel	180−380HB	**VP15TF**	490 (260−655)	≤0.05DC	≤0.05DC	.006 (≤.012)
M	Stainless Steel	≤270HB	**VP15TF**	490 (330−655)	≤0.05DC	≤0.05DC	.008 (≤.016)
K	Cast Iron	Tensile Strength ≤350MPa	**MP8010**	820 (590−1475)	≤0.05DC	≤0.1DC	.012 (≤.016)
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MP8010**	655 (260−985)	≤0.05DC	≤0.1DC	.012 (≤.016)
H	Hardened Steel	45−55HRC	**MP8010**	330 (260−395)	≤0.05DC	≤0.02DC	.004 (≤.008)
	Hardened Steel	55−65HRC	**MP8010**	260 (195−330)	≤0.05DC	≤0.02DC	.004 (≤.008)

* When the pick feed direction is along the axis of the tool such as finish machining at the wall part.

Slot milling / Shoulder milling(When large width of cut.*)

	Work Material	Hardness	Insert Grades	Cutting Speed **vc** (SFM)	Depth of Cut **ap** (inch)	Wide of Cut **ae** (inch)	Feed per Tooth **fz** (IPT)
P	Carbon Steel Alloy Steel	180−280HB	**VP15TF**	655 (260−985)	≤0.02DC	≤DC	.008 (≤.016)
	Pre-hardened steels	≤45HRC	**VP15TF**	490 (260−655)	≤0.02DC	≤DC	.006 (≤.012)
	Alloy Tool Steel	180−380HB	**VP15TF**	490 (260−655)	≤0.02DC	≤DC	.006 (≤.012)
M	Stainless Steel	≤270HB	**VP15TF**	490 (330−655)	≤0.02DC	≤DC	.008 (≤.016)
K	Cast Iron	Tensile Strength ≤350MPa	**MP8010**	835 (590−1475)	≤0.03DC	≤DC	.012 (≤.016)
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MP8010**	655 (260−985)	≤0.03DC	≤DC	.012 (≤.016)
H	Hardened Steel	45−55HRC	**MP8010**	330 (260−395)	≤0.01DC	≤DC	.004 (≤.006)
	Hardened Steel	55−65HRC	**MP8010**	230 (195−330)	≤0.01DC	≤DC	.004 (≤.008)

* When the pick feed direction is along the radius of the tool such as finish face machining.

(Note 1)This cutting condition is the standard condition when using the steel standard shank type.
If vibration or chipping on cutting edge occurs, please decrease the cutting condition as width of cut, depth of cut and feed per tooth depending on the situation.

(Note 2)Recommended cutting speeds apply to tool outside diameter.
Please calculate the spindle speed of tool in the following expressions.
Spindle speed of cutting tool n(min^{-1})=12×Cutting speed vc ÷ Diameter of cutting tool DC ÷ 3.14

INSERT INSTALLATION

1. Clean the insert and insert pocket

Thoroughly clean the insert and the insert pocket on the holder body.

2. Fitting the insert

Place the concave mark on the insert uppermost as shown with the clamp screw inserted from above. Fasten the clamp screw while firmly pressing the insert against the insert pocket wall. Use of a special anti seize lubricant MK1KS is recommended. Tighten at the recommended torque range.



BALL NOSE END MILL

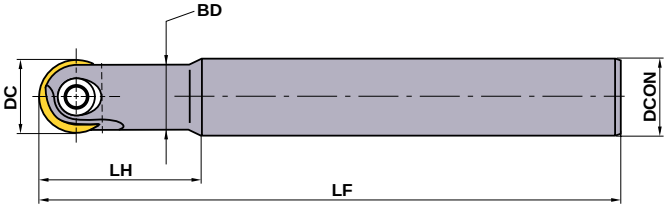
Finishing

Including curved faces

MBN

P M K N S H





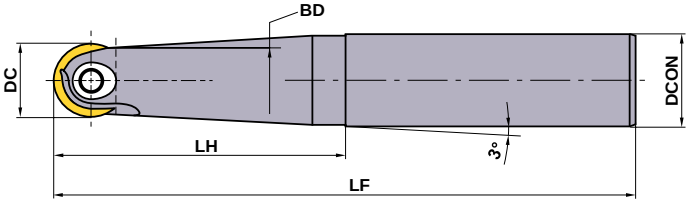
STRAIGHT MBN SERIES TOOL HOLDER

Order Number	Stock	Dimensions (inch)					* Insert Screw	Wrench	Insert
		DC	LF	DCON	LH	BD			
MBN040375SC	●	.375	3.540	.500	1.340	.335	BLS03	TKY15R	MBN0375
MBN**040500SB**	●	.500	5.910	.500	1.810	.413	BLS04	TKY20R	MBN0500
MBN**050625SB**	●	.625	6.300	.625	2.090	.551	BLS05	TKY20R	MBN0625
MBN**060750SA**	●	.750	8.270	.750	2.360	.709	BLS06	TKY20R	MBN0750
MBN**081000SA**	●	1.000	9.060	1.000	3.140	.882	BLS08	TKY30R	MBN1000
MBN**101250SB**	●	1.250	8.270	1.250	3.150	1.126	BLS12	TKY30R	MBN1250
MBN**10M300SB**	●	30mm	6.890	1.250	2.200	1.126	BLS12	TKY30R	MBNM300
MBN**10M300SC**	●	30mm	8.270	1.250	3.150	1.126	BLS12	TKY30R	MBNM300

(Note) Uses MBN style inserts only.

* Clamp Torque (lbf-in) : BLS03=27, BLS04=35, BLS05=44, BLS06=53, BLS08=58, BLS12=58





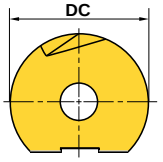
TAPERED NECK MBN SERIES TOOL HOLDER

Order Number	Stock	Dimensions (inch)					* Insert Screw	Wrench	Insert
		DC	LF	DCON	LH	BD			
MBN040312TB	●	.312	5.510	.500	1.970	.295	BLS02	TKY08D	MBN0312
MBN**040375TB**	●	.375	5.910	.500	1.380	.354	BLS03	TKY15R	MBN0375
MBN**050500TB**	●	.500	6.300	.625	2.360	.413	BLS04	TKY20R	MBN0500
MBN**060625TB**	●	.625	6.890	.750	2.640	.551	BLS05	TKY20R	MBN0625
MBN**080750TB**	●	.750	7.480	1.000	3.150	.709	BLS06	TKY20R	MBN0750
MBN**101000TB**	●	1.000	8.270	1.250	3.940	.882	BLS08	TKY30R	MBN1000
MBN**121250TB**	●	1.250	9.450	1.500	4.840	1.167	BLS12	TKY30R	MBN1250

(Note) Uses MBN style inserts only.

* Clamp Torque (lbf-in) : BLS02=18, BLS03=27, BLS04=35, BLS05=44, BLS06=53, BLS08=58, BLS12=58

INSERTS

Shape	Order Number	APL05	**DC** (inch)	Geometry
	**MBN0312001**	●	.312	
	MBN**0375001**	●	.375	
	MBN**0500001**	●	.500	
	MBN**0625001**	●	.625	
	MBN**0750001**	●	.750	
	MBN**1000001**	●	1.000	
	MBN**1250001**	●	1.250	
	MBN**M200001**	●	20mm (.7874)	
	MBN**M300001**	●	30mm (1.181)	

● : Inventory maintained.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RADIUS END MILL

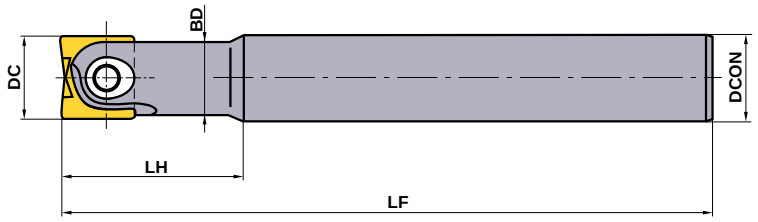
Finishing

Including curved faces

MBD/MBF

P M K N S H





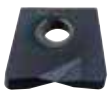
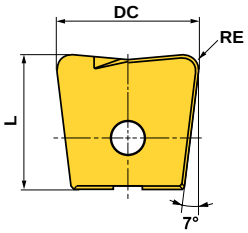
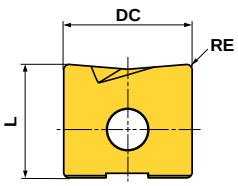
STRAIGHT NECK MBD SERIES TOOL HOLDER

Order Number	Stock	Dimensions (inch)					* Insert Screw	Wrench	Insert
		DC	LF	DCON	LH	BD			
MBD040500SB	●	.500	5.980	.500	1.890	.413	BLS04	TKY20R	MBD/F 0500
MBD050625SB	●	.625	6.380	.625	2.160	.551	BLS05	TKY20R	MBD/F 0625
MBD060750SB	●	.750	6.890	.750	2.480	.709	BLS06	TKY20R	MBD/F 0750
MBD081000SB	●	1.000	7.480	1.000	2.830	.882	BLS08	TKY30R	MBD/F 1000

(Note) Uses MBD and MBF style inserts only.

* Clamp Torque (lbf-in) : BLS04=35, BLS05=44, BLS06=53, BLS08=58

INSERTS

Shape	Order Number	APL05	**DC** (inch)	**RE** (inch)	**L** (inch)	Geometry
	**MBD0500021**	●	.500	.031	.550	***Backdraft*** 
	MBD**0500041**	●	.500	.063	.550	
	MBD**0625021**	●	.625	.031	.625	
	MBD**0625041**	●	.625	.063	.625	
	MBD**0750021**	●	.750	.031	.700	
	MBD**0750041**	●	.750	.063	.700	
	MBD**1000021**	●	1.000	.031	.925	
	MBD**1000041**	●	1.000	.063	.925	
	MBD**1000081**	●	1.000	.125	.925	
	**MBF0500021**	●	.500	.031	.550	***Flat Bottom*** 
	MBF**0500041**	●	.500	.063	.550	
	MBF**0625021**	●	.625	.031	.625	
	MBF**0625041**	●	.625	.063	.625	
	MBF**0750021**	●	.750	.031	.700	
	MBF**0750041**	●	.750	.063	.700	
	MBF**1000021**	●	1.000	.031	.925	
	MBF**1000041**	●	1.000	.063	.925	
	MBF**1000081**	●	1.000	.125	.925	

● : Inventory maintained.

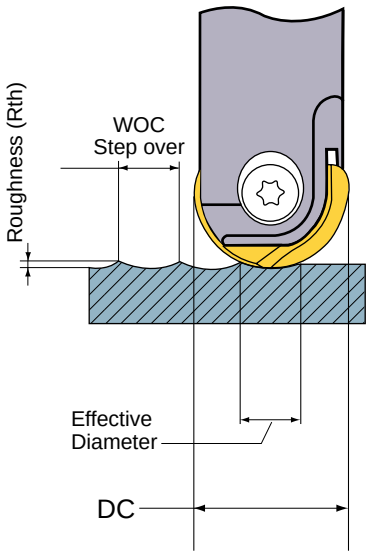
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

MBD/MBF/MBN

CALCULATED EFFECTIVE CUTTING DIAMETER FOR BALL NOSE AND FEEDRATE MULTIPLIER

Axial DOC	ϕ.3125" Ball Nose		ϕ.375" Ball Nose		ϕ.50" Ball Nose		ϕ.625" Ball Nose		ϕ.750" Ball Nose		ϕ20mm Ball Nose		ϕ1.0" Ball Nose		ϕ30mm Ball Nose		ϕ1.25" Ball Nose	
	Eff. Cutting Dia	Feed Rate Multiple	Eff. Cutting Dia	Feed Rate Multiple	Eff. Cutting Dia	Feed Rate Multiple	Eff. Cutting Dia	Feed Rate Multiple	Eff. Cutting Dia	Feed Rate Multiple	Eff. Cutting Dia	Feed Rate Multiple	Eff. Cutting Dia	Feed Rate Multiple	Eff. Cutting Dia	Feed Rate Multiple	Eff. Cutting Dia	Feed Rate Multiple
.005	.078	4.000	.086	4.200	.099	4.600	.111	5.000	.122	5.300	.125	5.390	.141	5.800	.153	6.170	.158	6.300
.010	.110	3.100	.121	3.300	.140	3.700	.157	4.000	.172	4.200	.176	4.280	.199	4.600	.216	4.900	.223	5.000
.020	.153	2.500	.169	2.700	.196	2.900	.220	3.100	.242	3.300	.248	3.400	.280	3.700	.304	3.890	.314	4.000
.050	.229	1.800	.255	2.000	.300	2.200	.339	2.300	.374	2.500	.384	2.500	.436	2.700	.475	2.870	.490	2.900
.075	.267	1.600	.300	1.700	.357	1.900	.406	2.000	.450	2.200	.462	2.190	.527	2.400	.576	2.500	.594	2.600
.100	.295	1.500	.332	1.600	.400	1.700	.458	1.800	.510	2.000	.524	1.990	.600	2.200	.657	2.280	.678	2.300
.125	.306	1.400	.354	1.400	.433	1.600	.500	1.700	.559	1.800	.575	1.850	.661	2.000	.727	2.110	.750	2.200
.156			.370	1.300	.463	1.500	.541	1.600	.609	1.700	.627	1.710	.726	1.900	.800	1.960	.826	2.000
.188			.375	1.000	.484	1.400	.573	1.500	.650	1.600	.671	1.610	.781	1.700	.864	1.840	.894	1.900
.250					.500	1.000	.612	1.400	.707	1.400	.733	1.470	.866	1.600	.964	1.680	1.000	1.700
.312							.625	1.000	.739	1.300	.770	1.360	.927	1.500	1.042	1.560	1.082	1.600
.375									.750	1.000	.787	1.280	.968	1.400	1.099	1.470	1.146	1.500
.600													1.000	1.000	1.000	1.000	1.225	1.300
.625																	1.250	1.000

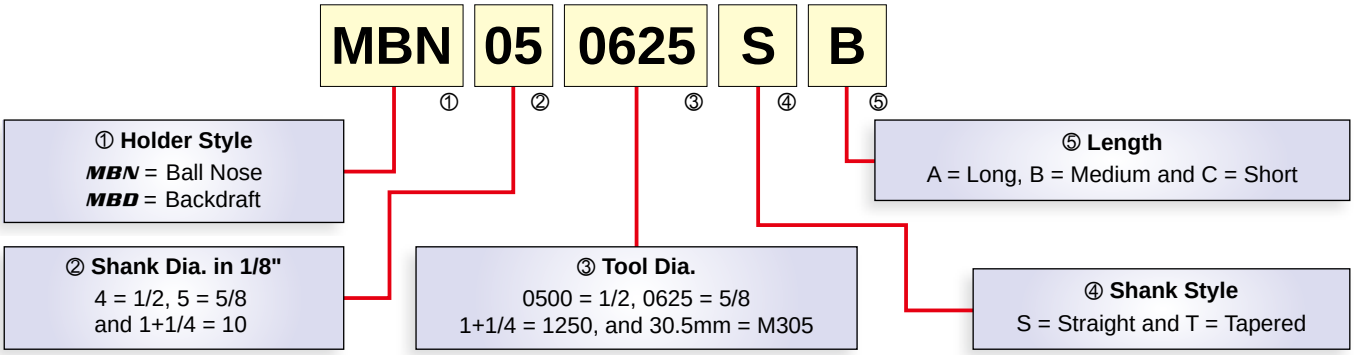
MBN insert with chipbreaker, axial depth of cut range .010" to 15% of cutter diameter. Rec. Axial DOC = .020" to .030"
MBN insert without chipbreaker depth of cut range .007" to .050". Rec. Axial = .015" to .030"
Ideal chip thickness = .005" to .008"
Excessive feed can deteriorate surface finish.



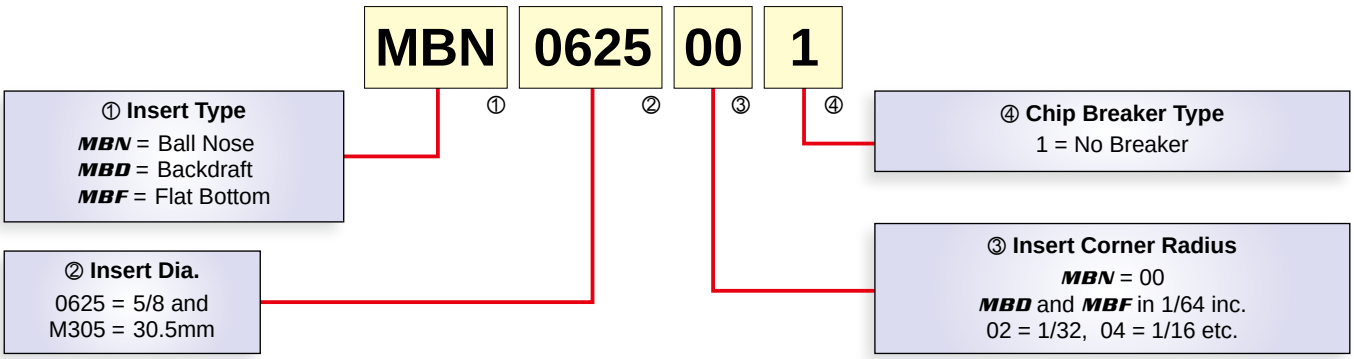
$$Rth = \frac{DC}{2} - \sqrt{\frac{DC^2 - WOC^2}{4}}$$

DC=Tool Diameter

MBN and MBD Tool Holder Descriptions



MBN, MBD and MBF Insert Descriptions



GRADE DESCRIPTIONS

APL05 A premium micrograin carbide combined with alternating layers of thermally stable TiAlN. This combination of micrograin carbide and TiAlN enables APL05 to exceed the most demanding high speed finishing requirements of the Die Mold professional.

RECOMMENDED FINISHING SPEEDS AND FEEDS

	Work Material	Hardness (BHN)	Cutting Speed (SFM)	Feed Rate (IPT)
P	Plain Carbon Steel	50—180	250—800	.004—.025
		180—330	250—800	
	Alloy Steels and Medium Carbon Tool Steels	135—330	220—650	.004—.015
		330—450	150—600	.004—.008
		450—500	400—500	.003—.006
M	Stainless Steels 200 & 300 Series	135—275	200—700	.004—.009
		135—330	230—650	.004—.011
	400 & 500 Series	330—425	180—600	.004—.008
		425—500	400—500	.003—.006
	PH Series	150—375	200—800	.004—.012
K	Gray Cast Iron	120—320	300—1000	.004—.014
	Ductile and Malleable Cast Iron	120—320	300—800	.004—.014
N	Aluminum Low Silicon	—	800—1000	.004—.020
	High Silicon	—	300—550	.003—.015
	Wood and Resins	—	1000—2400	.003—.020
	Graphite	—	800—1500	.003—.016
S	Nickel Base Alloys	140—300	80—450	.003—.008
		300—475	50—260	.003—.008
	Pure Titanium and Titanium Alloys	110—300	100—1200	.004—.010
		300—350	50—600	.004—.010
		350—440	35—300	.004—.010

BALL NOSE END MILL

Roughing

Including curved faces

SRM2

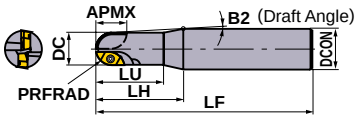
P M K N S H



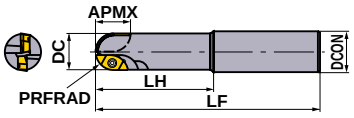
- Air / coolant through.
- Suitable for roughing to semi-finishing of small and medium molds.
- High rigidity body design.
- Low resistance chipbreaker.
- Key type clamp.
- Shrink fit ready.

Short Type

SRM210SAS2
SRM212SAS2

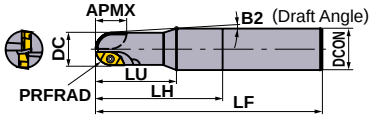


SRM216SAS2
SRM220SAS2

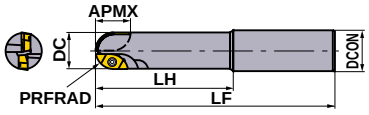


Medium Type

SRM210SAM2
SRM212SAM2

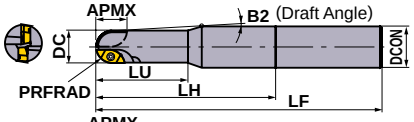


SRM216SAM2
SRM220SAM2

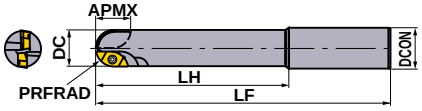


Long Type

SRM210SAL2
SRM212SAL2
SRM216SAL2

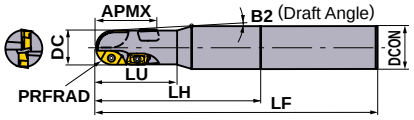


SRM220SAL2

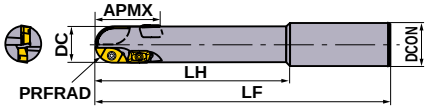


Long Edge Type

SRM212SAL4
SRM216SAL4



SRM220SAL4



Right hand tool holder only.

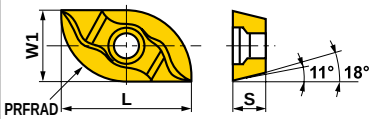
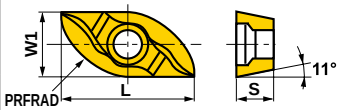
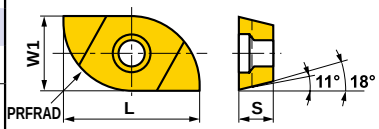
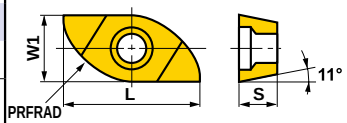
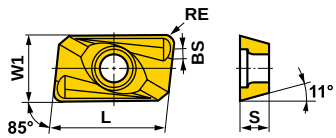
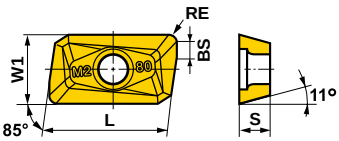
SHANK TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (inch)								Inner, Outer	Peripheral	Inner, Outer	Peripheral	Inner	Outer	Peripheral
		R		PRFRAD	DC	LF	DCON	LH	LU	APMX	B2	Insert Screw		Wrench		Insert		
Short	**SRM210SAS2**	●	2	.313	.625	4	.75	1.5	1.0	.625	3°	TS25H	—	① TKY08D	—	SRM210C-M	SRM210E-M	—
	SRM**212SAS2**	●	2	.375	.75	4	1	1.5	1.25	.750	6° 30'	TS32	—	① TKY08D	—	SRM212C SRM212C-M	SRM212E SRM212E-M	—
	SRM**216SAS2**	●	2	.500	1	4.5	1	2	—	.945	—	TS43	—	② TKY15T	—	SRM216C SRM216C-M	SRM216E SRM216E-M	—
	SRM**220SAS2**	●	2	.625	1.25	5	1.25	2	—	1.102	—	TS55	—	② TKY25T	—	SRM220C SRM220C-M	SRM220E SRM220E-M	—
Medium	**SRM210SAM2**	●	2	.313	.625	5	.75	2.5	1.0	.625	1° 30'	TS25H	—	① TKY08D	—	SRM210C-M	SRM210E-M	—
	SRM**212SAM2**	●	2	.375	.75	5	1	2.5	1.25	.750	1° 30'	TS32	—	① TKY08D	—	SRM212C SRM212C-M	SRM212E SRM212E-M	—
	SRM**216SAM2**	●	2	.500	1	5.5	1	3	—	.945	—	TS43	—	② TKY15T	—	SRM216C SRM216C-M	SRM216E SRM216E-M	—
	SRM**220SAM2**	●	2	.625	1.25	6.5	1.25	3.5	—	1.102	—	TS55	—	② TKY25T	—	SRM220C SRM220C-M	SRM220E SRM220E-M	—
Long	**SRM210SAL2**	●	2	.313	.625	6	.75	3.5	1.0	.625	1° 30'	TS25H	—	① TKY08D	—	SRM210C-M	SRM210E-M	—
	SRM**212SAL2**	●	2	.375	.75	6	1	3.5	1.50	.750	1° 30'	TS32	—	① TKY08D	—	SRM212C SRM212C-M	SRM212E SRM212E-M	—
	SRM**216SAL2**	●	2	.500	1	6.5	1.25	4	1.75	.945	1° 30'	TS43	—	② TKY15T	—	SRM216C SRM216C-M	SRM216E SRM216E-M	—
	SRM**220SAL2**	●	2	.625	1.25	8	1.25	5	—	1.102	—	TS55	—	② TKY25T	—	SRM220C SRM220C-M	SRM220E SRM220E-M	—
Long Edge	**SRM212SAL4**	●	4	.375	.75	6	1	3.5	1.50	1.180	1° 30'	TS32	TS25	① TKY08D	① TKY08D	SRM212C SRM212C-M	SRM212E SRM212E-M	APMT1135 PDER-□2
	SRM**216SAL4**	●	4	.500	1	6.5	1.25	4	1.75	1.457	1° 30'	TS43	TS25	② TKY15T	③ TKY08F	SRM216C SRM216C-M	SRM216E SRM216E-M	APMT1135 PDER-□2
	SRM**220SAL4**	●	4	.625	1.25	8	1.25	5	—	1.732	—	TS55	TS43	② TKY25T	③ TKY15F	SRM220C SRM220C-M	SRM220E SRM220E-M	APMT1604 PDER-□2

∗ Clamp Torque (lbf-in) : TS25H=8.9, TS25=8.9, TS32=8.9, TS43=31, TS55=66

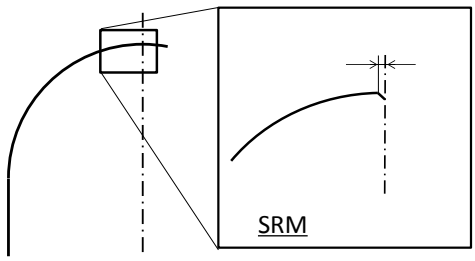
● : Inventory maintained.
<10 inserts in one case>

INSERTS

Type		Shape	Order Number	Class	Coated VP15TF		Dimensions (inch) PRFRAD	L	W1	S	BS	RE	Geometry
Inner	With Breaker		**SRM210C-M**	M	●		.313	.630	.323	.138	–	–	
			SRM212C-M	M	●		.375	.748	.385	.169	–	–	
			SRM216C-M	M	●		.500	.945	.512	.216	–	–	
			SRM220C-M	M	●		.625	1.102	.638	.275	–	–	
Outer	With Breaker		**SRM210E-M**	M	●		.313	.531	.258	.138	–	–	
			SRM212E-M	M	●		.375	.610	.315	.169	–	–	
			SRM216E-M	M	●		.500	.807	.409	.216	–	–	
			SRM220E-M	M	●		.625	.964	.520	.275	–	–	
Inner	No Breaker	Strong Cutting Edge Type 	**SRM212C**	M	●		.375	.748	.385	.169	–	–	
			SRM216C	M	●		.500	.945	.512	.216	–	–	
			SRM220C	M	●		.625	1.102	.638	.275	–	–	
Outer	No Breaker	Strong Cutting Edge Type 	**SRM212E**	M	●		.375	.610	.315	.169	–	–	
			SRM216E	M	●		.500	.807	.409	.216	–	–	
			SRM220E	M	●		.625	.964	.520	.275	–	–	
Peripheral	With Breaker	Strong Cutting Edge Type 	**APMT1135PDER-H2**	M	●		–	.433	.250	.138	.047	.031	
			APMT1604PDER-H2	M	●		–	.650	.375	.187	.055	.031	
	With Breaker	Low Resistance Type 	**APMT1135PDER-M2**	M	●		–	.433	.250	.138	.047	.031	
			APMT1604PDER-M2	M	●		–	.650	.375	.187	.055	.031	

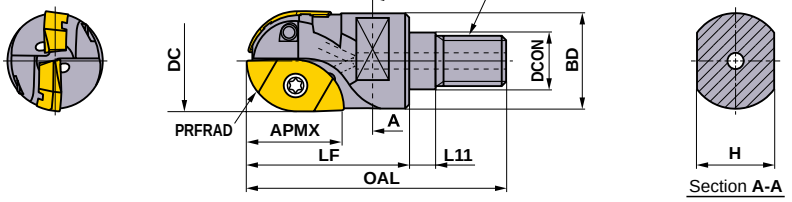
(Note) The **M** type breaker (APMT....PDER-M2) is the first recommendation for its excellent cutting performance.
Please use **H** type breakers (APMT....PDER-H2) due to cutting edge strength.

(Note) SRM tooling is designed for rough machining applications. *Programming Note: If you choose to use SRM tooling for semi-finishing applications, care must be taken when setting the tool height. The SRM insert includes a chamfer flat at the tip as illustrated. To assist with SRM programming needs, please download our CAD data from our web site; http://www.mitsubishicarbide.com/

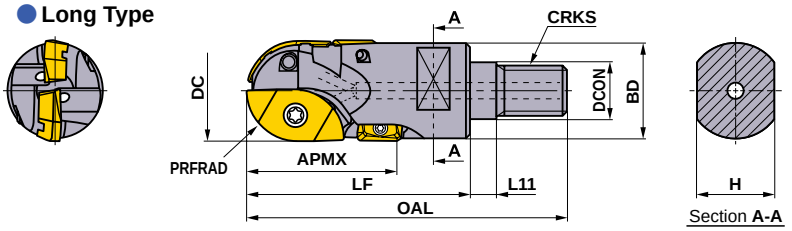




● Standard Type



● Long Type



METRIC Standard

SCREW-IN TYPE

Right hand tool holder only.

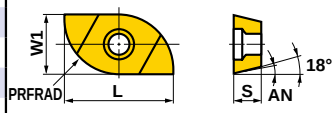
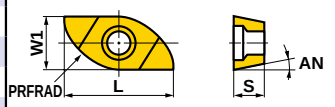
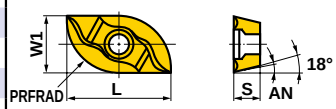
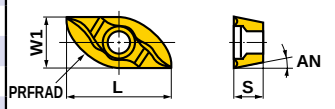
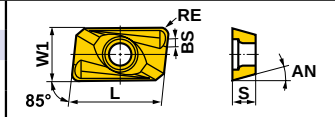
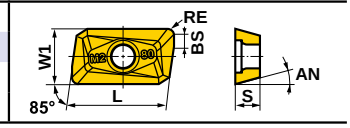
Type	Order Number	Stock R	Coolant Thru ✶3	Dimensions (mm) PRFRAD	DC	DCON	BD	OAL	LF	L11	H	CRKS ✶2	APMX	WT (kg) ✶4	✶1 Inner, Outer Insert Screw	✶1 Peripheral Insert Screw	Wrench	Inner Insert	Outer Insert	Peripheral Insert
Standard	SRM2160AM08S30	★	Y	8	16	8.5	14.6	48	30	6	10	M8	12	0.1	TS25H	—	①TKY08D	SRG16C SRM16C-M	SRG16E SRM16E-M	—
	SRM2200AM10S35	★	Y	10	20	10.5	18.6	54	35	6	14	M10	14	0.1	TS32	—	①TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	—
	SRM2250AM12S40	★	Y	12.5	25	12.5	23.5	62	40	6	19	M12	19	0.2	TS43	TS25	②TKY15T	SRG25C SRM25C-M	SRG25E SRM25E-M	—
	SRM2300AM16S45	★	Y	15	30	17	28.3	68	45	6	24	M16	24	0.2	TS55	—	②TKY15T ③TKY08F	SRG30C SRM30C-M	SRG30E SRM30E-M	—
	SRM2320AM16S45	★	Y	16	32	17	30.0	68	45	6	24	M16	28	0.2	TS55	TS43	②TKY25T ③TKY15F	SRG32C SRM32C-M	SRG32E SRM32E-M	—
Long	SRM2200AM10L45	★	Y	10	20	10.5	18.6	64	45	6	14	M10	30	0.2	TS32	TS25	①TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-□2
	SRM2250AM12L55	★	Y	12.5	25	12.5	23.5	77	55	6	19	M12	37	0.3	TS43	TS25	②TKY15T ③TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-□2
	SRM2300AM16L60	★	Y	15	30	17	28.3	83	60	6	24	M16	44	0.3	TS55	TS43	②TKY25T ③TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-□2
	SRM2320AM16L60	★	Y	16	32	17	29.0	83	60	6	24	M16	44	0.3	TS55	TS43	②TKY25T ③TKY15F	SRG32C SRM32C-M	SRG32E SRM32E-M	APMT1604 PDER-□2

✶1 Clamp Torque (lbf-in) : TS25H=8.9, TS25=8.9, TS32=8.9, TS43=31, TS55=66
✶2 Clamp Torque of the Head (lbf-ft) : M8=17.1, M10=33.8, M12=59.2, M16=66.7
✶3 Y=Yes
✶4 WT : Mass

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

INSERTS

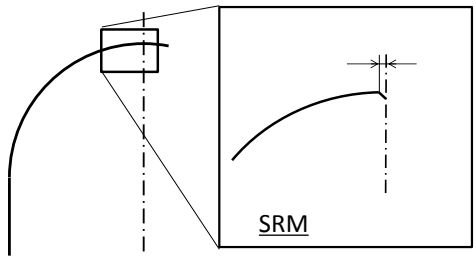
For Metric Standard

Type	Shape	Order Number	Class	Coated F7030	Coated VP15TF	PRFRAD	L	W1	S	BS	RE	AN	Geometry
Inner	Strong Cutting Edge Type 	**SRG16C**	G		★	8	16	8.2	3.5	—	—	11°	
		SRG20C	G		★	10	19	10.2	4.6	—	—	10°	
		SRG25C	G		★	12.5	24	12.8	5.5	—	—	10°	
		SRG30C	G		★	15	28	15.3	7	—	—	10°	
		SRG32C	G		★	16	28	16.3	7	—	—	10°	
Outer	Strong Cutting Edge Type 	**SRG16E**	G		★	8	13.5	6.7	3.5	—	—	11°	
		SRG20E	G		★	10	15.5	8.5	4.6	—	—	9°	
		SRG25E	G		★	12.5	20.5	10.2	5.5	—	—	9°	
		SRG30E	G		★	15	25.2	12.2	7	—	—	9°	
		SRG32E	G		★	16	26.1	13.1	7	—	—	9°	
Inner	Low Resistance Type 	**SRM16C-M**	M		★	8	16	8.2	3.5	—	—	11°	
		SRM20C-M	M		★	10	19	10.2	4.6	—	—	10°	
		SRM25C-M	M		★	12.5	24	12.8	5.5	—	—	10°	
		SRM30C-M	M		★	15	28	15.3	7	—	—	10°	
		SRM32C-M	M		★	16	28	16.3	7	—	—	10°	
Outer	Low Resistance Type 	**SRM16E-M**	M		★	8	13.5	6.7	3.5	—	—	11°	
		SRM20E-M	M		★	10	15.5	8.5	4.6	—	—	9°	
		SRM25E-M	M		★	12.5	20.5	10.2	5.5	—	—	9°	
		SRM30E-M	M		★	15	25.2	12.2	7	—	—	9°	
		SRM32E-M	M		★	16	26.1	13.1	7	—	—	9°	
Peripheral *	Strong Cutting Edge Type 	**APMT1135PDER-H2**	M	●	●	—	11	6.35	3.5	1.2	0.8	11°	
		APMT1604PDER-H2	M	●	●	—	16.5	9.525	4.76	1.4	0.8	11°	
	Low Resistance Type 	**APMT1135PDER-M2**	M	●	●	—	11	6.35	3.5	1.2	0.8	11°	
		APMT1604PDER-M2	M	●	●	—	16.5	9.525	4.76	1.4	0.8	11°	

(Low-resistance inner or outer inserts are precision M class type.)

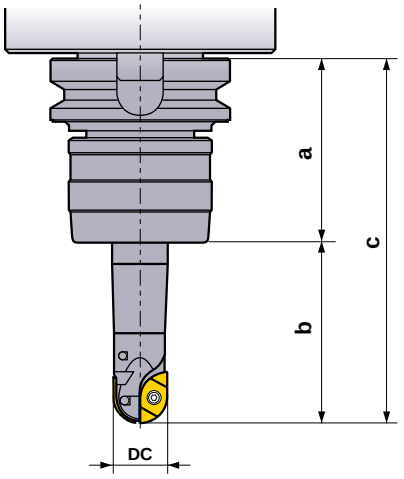
★ Selection guide for peripheral cutting edges : The first recommendation is the super sharp M breaker (APMT....PDER-M2).
When cutting edge strength is particularly important, use the H breaker (APMT....PDER-H2).

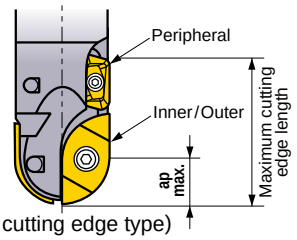
(Note) SRM tooling is designed for rough machining applications. *Programming Note: If you choose to use SRM tooling for semi-finishing applications, care must be taken when setting the tool height. The SRM insert includes a chamfer flat at the tip as illustrated. To assist with SRM programming needs, please download our CAD data from our web site; http://www.mitsubishicarbide.com/



SCREW-IN ARBORS ➤ K162
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS





(Long cutting edge type)

Tool Overhang

Recommended cutting conditions on this literature are chosen based on deflection, vibration and machined surface when using a CAT50 arbor. Conditions-**"a"** is the length from a gage line to the arbor end face, and **"b"** is the neck length (tool overhang from the arbor).

(Inch)

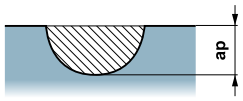
Cutting Diameter : DC	Type	a	b	c
.625"	Short	4	1.5	5.5
	Medium		2.5	6.5
	Long		3.5	7.5
.750"	Short		1.5	5.5
	Medium		2.5	6.5
	Long		3.5	7.5
1.000"	Short		2.0	6.0
	Medium		3.0	7.0
	Long		4.0	8.0
1.250"	Short		2.0	6.0
	Medium		3.5	7.5
	Long		5.0	9.0

Recommended Depth of Cut for Long Cutting Edge Type

The maximum cutting edge length of the long cutting edge type with a peripheral insert is 1.4-1.5DC. The peripheral insert is for light machining only.
Maximum ap is 0.5DC or below.

SLOT MILLING

Cutting Mode

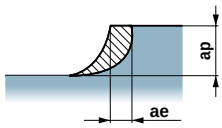


N: Spindle Speed (RPM)
F: Table Feed (IPM)

	Work Material	Hardness	Cutting Speed (SFM)	Grade	Type	ϕ.625" (ϕ16mm)			ϕ.750" (ϕ20mm)			ϕ1.000" (ϕ25mm)			ϕ1.250" (ϕ32mm)		
						N	F	ap	N	F	ap	N	F	ap	N	F	ap
P	Carbon Steel Alloy Steel	180–280HB	500 (375–667)	VP15TF	Short	3056	14	.236	2546	12	.315	1910	18	.500	1528	14	.625
					Medium	3056	14	.157	2546	12	.157	1910	18	.500	1528	14	.625
					Long	3056	14	.079	2546	12	.079	1910	18	.333	1528	14	.417
		280–350HB	458 (375–542)	VP15TF	Short	2801	13	.236	2334	11	.315	1751	17	.500	1401	13	.625
					Medium	2801	13	.157	2334	11	.157	1751	17	.500	1401	13	.625
					Long	2801	13	.079	2334	11	.079	1751	17	.333	1401	13	.417
	Pre-Hardened Steel	35–45HRC	375 (333–500)	VP15TF	Short	2292	11	.236	1910	9	.315	1432	14	.500	1146	11	.625
					Medium	2292	11	.157	1910	9	.157	1432	14	.500	1146	11	.625
					Long	2292	11	.079	1910	9	.079	1432	14	.333	1146	11	.417
	Alloy Tool Steel	≤350HB	458 (375–542)	VP15TF	Short	2801	13	.236	2334	11	.315	1751	17	.500	1401	13	.625
					Medium	2801	13	.157	2334	11	.157	1751	17	.500	1401	13	.625
					Long	2801	13	.079	2334	11	.079	1751	17	.333	1401	13	.417
M	Stainless Steel	≤270HB	500 (333–667)	VP15TF	Short	3056	14	.157	2546	12	.197	1910	18	.500	1528	14	.625
					Medium	3056	14	.118	2546	12	.118	1910	18	.500	1528	14	.625
					Long	3056	14	.079	2546	12	.059	1910	18	.333	1528	14	.417
K	Gray Cast Iron	≤350MPa	667 (500–1000)	VP15TF	Short	4074	32	.236	3395	27	.315	2546	24	.500	2037	19	.625
					Medium	4074	32	.157	3395	27	.157	2546	24	.500	2037	19	.625
					Long	4074	26	.079	3395	27	.079	2546	24	.333	2037	19	.417
	Ductile Cast Iron	≤500MPa	583 (500–750)	VP15TF	Short	3565	28	.236	2971	23	.315	2228	21	.500	1783	17	.625
					Medium	3565	28	.157	2971	23	.157	2228	21	.500	1783	17	.625
					Long	3565	22	.079	2971	23	.079	2228	21	.333	1783	17	.417
		≤800MPa	500 (500–750)	VP15TF	Short	3056	24	.236	2546	20	.315	1910	18	.500	1528	14	.625
					Medium	3056	24	.157	2546	20	.157	1910	18	.500	1528	14	.625
					Long	3056	19	.079	2546	20	.079	1910	18	.333	1528	14	.417
H	Heat Treated Steel	45–50HRC	333 (167–417)	VP15TF	Short	2037	10	.157	1698	8	.157	1273	12	.500	1019	10	.625
					Medium	2037	10	.079	1698	8	.079	1273	12	.500	1019	10	.625
					Long	2037	10	.039	1698	8	.039	1273	12	.333	1019	10	.417
		50–60HRC	188 (125–333)	VP15TF	Short	1146	5	.157	955	5	.157	716	7	.500	573	5	.625
					Medium	1146	5	.079	955	5	.079	716	7	.500	573	5	.625
					Long	1146	5	.039	955	5	.039	716	7	.333	573	5	.417

SHOULDER MILLING (Cutting Depth : Small)

Cutting Mode

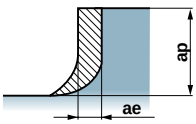


N : Spindle Speed (RPM)
F : Table Feed (IPM)

	Work Material	Hardness	Cutting Speed (SFM)	Grade	Type	ϕ.625" (ϕ16mm)				ϕ.750" (ϕ20mm)				ϕ1.000" (ϕ25mm)				ϕ1.250" (ϕ32mm)			
						N	F	ap	ae	N	F	ap	ae	N	F	ap	ae	N	F	ap	ae
P	Carbon Steel Alloy Steel	180–280HB	625 (375–750)	VP15TF	Short	3820	30	.157	.236	3183	38	.197	.315	2387	28	.250	.500	1910	23	.313	.625
					Medium	3820	24	.157	.157	3183	25	.197	.236	2387	23	.250	.400	1910	18	.313	.500
					Long	3820	18	.157	.079	3183	15	.197	.157	2387	23	.250	.300	1910	18	.313	.375
		280–350HB	500 (375–667)	VP15TF	Short	3056	19	.157	.236	2546	20	.197	.315	1910	23	.250	.500	1528	18	.313	.625
					Medium	3056	14	.157	.157	2546	16	.197	.236	1910	18	.250	.400	1528	14	.313	.500
					Long	3056	14	.157	.079	2546	12	.197	.157	1910	18	.250	.300	1528	14	.313	.375
	Pre-Hardened Steel	35–45HRC	500 (375–667)	VP15TF	Short	3056	19	.157	.236	2546	20	.197	.315	1910	23	.250	.500	1528	18	.313	.625
					Medium	3056	14	.157	.157	2546	16	.197	.236	1910	18	.250	.400	1528	14	.313	.500
					Long	3056	14	.157	.079	2546	12	.197	.157	1910	18	.250	.300	1528	14	.313	.375
	Alloy Tool Steel	≤350HB	500 (375–542)	VP15TF	Short	3056	19	.157	.236	2546	20	.197	.315	1910	23	.250	.500	1528	18	.313	.625
					Medium	3056	14	.157	.157	2546	16	.197	.236	1910	18	.250	.400	1528	14	.313	.500
					Long	3056	14	.157	.079	2546	12	.197	.157	1910	18	.250	.300	1528	14	.313	.375
M	Stainless Steel	≤270HB	625 (333–667)	VP15TF	Short	3820	18	.157	.236	3183	20	.197	.315	2387	28	.250	.500	1910	23	.313	.625
					Medium	3820	18	.157	.157	3183	15	.197	.236	2387	23	.250	.400	1910	18	.313	.500
					Long	3820	18	.157	.079	3183	15	.197	.157	2387	23	.250	.300	1910	18	.313	.375
K	Gray Cast Iron	≤350MPa	625 (500–1000)	VP15TF	Short	3820	60	.157	.315	3183	63	.197	.394	2387	32	.250	.500	1910	26	.313	.625
					Medium	3820	45	.157	.236	3183	50	.197	.315	2387	23	.250	.400	1910	18	.313	.500
					Long	3820	36	.157	.157	3183	38	.197	.236	2387	23	.250	.300	1910	18	.313	.375
	Ductile Cast Iron	≤500MPa	625 (500–750)	VP15TF	Short	3820	60	.157	.315	3183	63	.197	.394	2387	28	.250	.500	1910	23	.313	.625
					Medium	3820	45	.157	.236	3183	50	.197	.315	2387	23	.250	.400	1910	18	.313	.500
					Long	3820	36	.157	.157	3183	38	.197	.236	2387	23	.250	.300	1910	18	.313	.375
		≤800MPa	583 (500–750)	VP15TF	Short	3565	56	.157	.315	2971	58	.197	.394	2228	26	.250	.500	1783	21	.313	.625
					Medium	3565	42	.157	.236	2971	47	.197	.315	2228	21	.250	.400	1783	17	.313	.500
					Long	3565	34	.157	.157	2971	35	.197	.236	2228	21	.250	.300	1783	17	.313	.375
H	Heat Treated Steel	45–50HRC	333 (167–417)	VP15TF	Short	2037	10	.157	.157	1698	8	.197	.197	1273	15	.250	.250	1019	12	.313	.313
					Medium	2037	10	.157	.079	1698	8	.197	.118	1273	12	.250	.200	1019	10	.313	.250
					Long	2037	10	.157	.039	1698	8	.197	.079	1273	12	.250	.150	1019	10	.313	.188
		50–60HRC	188 (125–333)	VP15TF	Short	1146	5	.157	.157	955	5	.197	.197	716	8	.250	.250	573	7	.313	.313
					Medium	1146	5	.157	.079	955	5	.197	.118	716	7	.250	.200	573	5	.313	.250
					Long	1146	5	.157	.039	955	5	.197	.079	716	7	.250	.150	573	5	.313	.188

SHOULDER MILLING (Cutting Depth : Large)

Cutting Mode



N : Spindle Speed (RPM)
F : Table Feed (IPM)

★Machining Stainless Steels

Down cutting (Climb milling) is preferred.

	Work Material	Hardness	Cutting Speed (SFM)	Grade	Type	ϕ.625" (ϕ16mm)				ϕ.750" (ϕ20mm)				ϕ1.000" (ϕ25mm)				ϕ1.250" (ϕ32mm)			
						N	F	ap	ae	N	F	ap	ae	N	F	ap	ae	N	F	ap	ae
P	Carbon Steel Alloy Steel	180–280HB	625 (375–750)	VP15TF	Short	3820	24	.315	.157	3183	30	.394	.157	2387	28	.500	.250	1910	23	.625	.313
					Medium	3820	18	.315	.118	3183	20	.394	.118	2387	23	.500	.250	1910	18	.625	.313
					Long	3820	18	.315	.079	3183	15	.394	.079	2387	23	.500	.200	1910	18	.625	.250
		280–350HB	500 (375–667)	VP15TF	Short	3056	14	.315	.157	2546	20	.394	.157	1910	23	.500	.250	1528	18	.625	.313
					Medium	3056	14	.315	.118	2546	12	.394	.118	1910	18	.500	.250	1528	14	.625	.313
					Long	3056	14	.315	.079	2546	12	.394	.079	1910	18	.500	.200	1528	14	.625	.250
	Pre-Hardened Steel	35–45HRC	500 (375–667)	VP15TF	Short	3056	14	.315	.157	2546	20	.394	.157	1910	23	.500	.250	1528	18	.625	.313
					Medium	3056	14	.315	.118	2546	12	.394	.118	1910	18	.500	.250	1528	14	.625	.313
					Long	3056	14	.315	.079	2546	12	.394	.079	1910	18	.500	.200	1528	14	.625	.250
	Alloy Tool Steel	≤350HB	500 (375–542)	VP15TF	Short	3056	14	.315	.157	2546	20	.394	.157	1910	23	.500	.250	1528	18	.625	.313
					Medium	3056	14	.315	.118	2546	12	.394	.118	1910	18	.500	.250	1528	14	.625	.313
					Long	3056	14	.315	.079	2546	12	.394	.079	1910	18	.500	.200	1528	14	.625	.250
M	Stainless Steel	≤270HB	625 (333–667)	VP15TF	Short	3820	18	.315	.157	3183	20	.394	.157	2387	28	.500	.333	1910	23	.625	.417
					Medium	3820	18	.315	.118	3183	15	.394	.118	2387	23	.500	.267	1910	18	.625	.333
					Long	3820	18	.315	.079	3183	15	.394	.079	2387	23	.500	.200	1910	18	.625	.250
K	Gray Cast Iron	≤350MPa	625 (500–1000)	VP15TF	Short	3820	45	.315	.315	3183	50	.394	.315	2387	32	.500	.333	1910	26	.625	.417
					Medium	3820	36	.315	.197	3183	38	.394	.157	2387	23	.500	.267	1910	18	.625	.417
					Long	3820	30	.315	.118	3183	30	.394	.079	2387	23	.500	.200	1910	18	.625	.333
	Ductile Cast Iron	≤500MPa	625 (500–750)	VP15TF	Short	3820	45	.315	.315	3183	50	.394	.315	2387	28	.500	.333	1910	23	.625	.417
					Medium	3820	36	.315	.197	3183	38	.394	.157	2387	23	.500	.267	1910	18	.625	.417
					Long	3820	30	.315	.118	3183	30	.394	.079	2387	23	.500	.200	1910	18	.625	.333
		≤800MPa	583 (500–750)	VP15TF	Short	3565	42	.315	.315	2971	47	.394	.315	2228	26	.500	.333	1783	21	.625	.417
					Medium	3565	34	.315	.197	2971	35	.394	.157	2228	21	.500	.267	1783	17	.625	.417
					Long	3565	28	.315	.118	2971	28	.394	.079	2228	21	.500	.200	1783	17	.625	.333
H	Heat Treated Steel	45–50HRC	333 (167–417)	VP15TF	Short	2037	10	.315	.079	1698	8	.394	.118	1273	15	.500	.200	1019	12	.625	.250
					Medium	2037	10	.315	.039	1698	8	.394	.079	1273	12	.500	.160	1019	10	.625	.200
					Long	2037	10	.315	.039	1698	8	.394	.039	1273	12	.500	.120	1019	10	.625	.150
		50–60HRC	188 (125–333)	VP15TF	Short	1146	5	.315	.079	955	5	.394	.118	716	8	.500	.200	573	7	.625	.250
					Medium	1146	5	.315	.039	955	5	.394	.079	716	7	.500	.160	573	5	.625	.200
					Long	1146	5	.315	.039	955	5	.394	.039	716	7	.500	.120	573	5	.625	.150

BALL NOSE END MILL

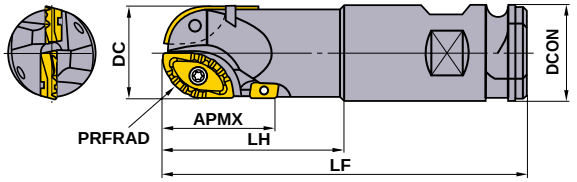
Roughing

SRM2 Ø40(1.575") Ø50(1.969")

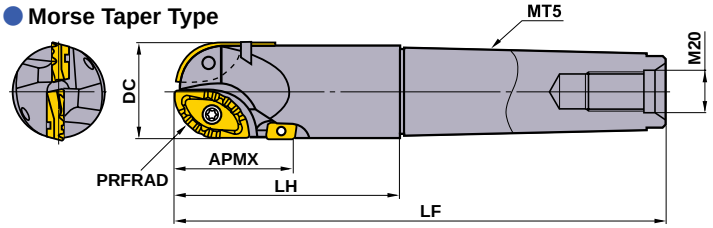
P M K N S H



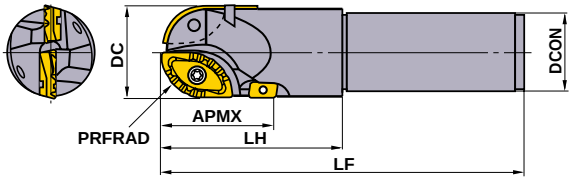
Combination Type



Morse Taper Type



Straight Type



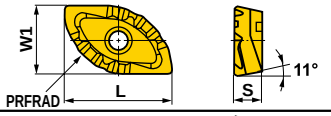
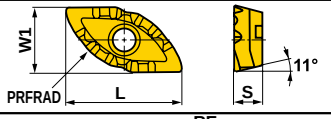
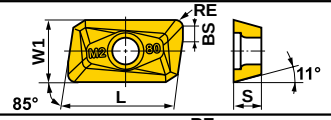
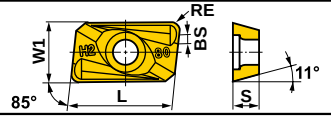
METRIC Standard

Right hand tool holder only.

Type		Order Number	Stock R	Number of Flutes	Dimensions (inch) PRFRAD	DC	DCON	LF	LH	APMX	Inner, Outer Insert Screw	Peripheral Insert Screw	Inner, Outer Wrench	Peripheral Wrench	Inner Insert	Outer Insert	Peripheral Insert
Combination	Standard	SRM2400WNLS	★	2	.787	1.575	2.000	7.874	4.724	2.126	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-□2
		SRM2500WNLS	★	2	.984	1.969	2.000	7.874	4.724	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
	Long	SRM2400WNLM	★	2	.787	1.575	2.000	9.843	6.693	2.126	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-□2
		SRM2500WNLM	★	2	.984	1.969	2.000	9.843	6.693	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
	Extra Long	SRM2500WNLL	★	2	.984	1.969	2.000	11.811	8.661	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
		SRM2500WNLX	★	2	.984	1.969	2.000	13.780	10.630	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
Straight	Standard	SRM2400SNLS	★	2	.787	1.575	1.654	7.874	3.937	2.126	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-□2
		SRM2500SNLS	★	2	.984	1.969	1.654	7.874	3.937	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
	Long	SRM2400SNLM	★	2	.787	1.575	1.654	9.843	5.906	2.126	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-□2
		SRM2500SNLM	★	2	.984	1.969	1.654	9.843	3.937	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
Morse Taper	Standard	SRM2500MNLS	★	2	.984	1.969	—	10.079	4.724	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
	Long	SRM2500MNLM	★	2	.984	1.969	—	11.260	5.906	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2

★ Clamp Torque (lbf-in) : TS43=31, TS6=89, TS6S=89

INSERTS

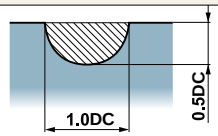
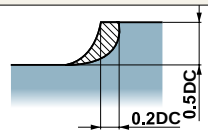
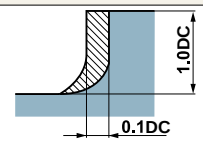
Application	Shape	Order Number	Class	Coated VP15TF	VP20RT	VP30RT	Dimensions (inch) PRFRAD	L	W1	S	BS	RE	Geometry
Inner		★SRG40C	G	★	★	★	.787	1.417	.807	.315	—	—	
		★SRG50C	G	★	★	★	.984	1.575	1.024	.335	—	—	
Outer		★SRG40E	G	★	★	★	.787	1.260	.654	.315	—	—	
		★SRG50E	G	★	★	★	.984	1.409	.787	.335	—	—	
Peripheral		APMT1604PDER-M2	M	●			—	.650	.375	.187	.055	.031	
	Strong Cutting Edge Type 	APMT1604PDER-H2	M	●			—	.650	.375	.187	.055	.031	

★ 2 inserts in one case.

● : Inventory maintained. ★ : Inventory maintained in Japan.

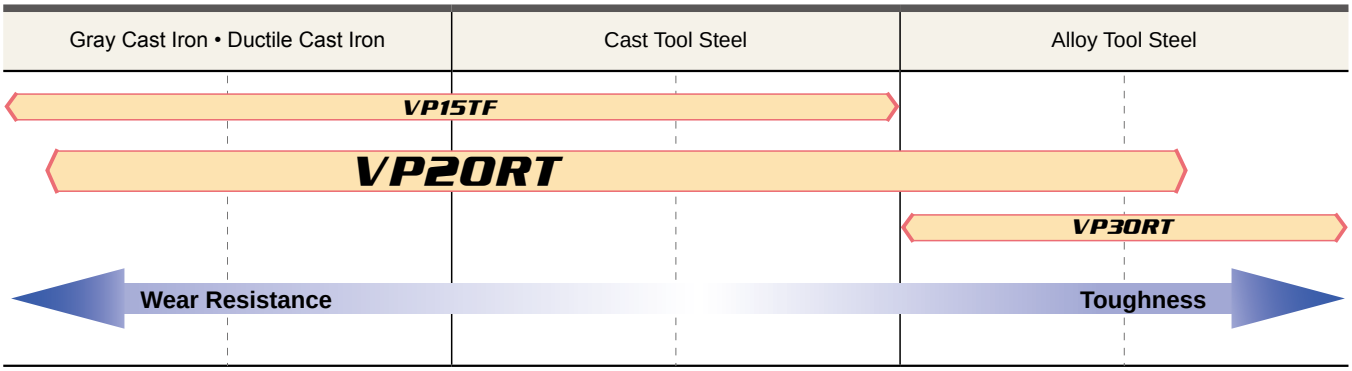
<10 inserts in one case>

RECOMMENDED CUTTING CONDITIONS

Cutting Mode	A : Slot Milling	B : Shoulder Milling (Standard Type)	C : Shoulder Milling (Long Cutting Edge Type)
			

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed per Tooth (IPR)	Cutting Mode
P	Alloy Tool Steel	≤250HB	**VP20RT VP30RT**	655 (525—820)	.008 (.004—.012)	A
					.008 (.004—.016)	B
					.012 (.004—.016)	C
	Cast Tool Steel	≤230HB	**VP15TF VP20RT**	655 (525—985)	.008 (.004—.012)	A
					.012 (.004—.018)	B
					.008 (.004—.016)	C
K	Ductile Cast Iron	Tensile Strength ≤540MPa	**VP15TF VP20RT**	655 (525—985)	.010 (.004—.016)	A
					.010 (.004—.018)	B
					.014 (.004—.018)	C
	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF VP20RT**	655 (525—985)	.010 (.004—.016)	A
					.014 (.004—.018)	B
					.010 (.004—.016)	C

GRADE APPLICATION GUIDE



SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

VERTICAL FEED MILLING

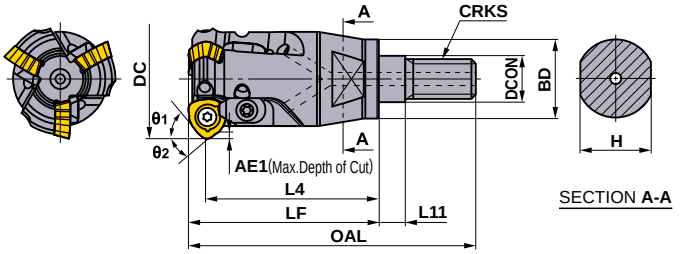
Roughing

PMC

P M K N S H



- For under-cutting trimmed part of press mold.
- 2 directional cutting with large overhang.
- Suitable for automated 3 axis programming.



SECTION A-A

Right hand tool holder only.

Order Number	Stock R	Coolant Hole *1	Number of Teeth	Dimensions (mm) DC	DCON	BD	OAL	LF	L4	L11	H	CRKS *2	AE1	θ1	θ2	*3 WT (kg)	Insert	Shank Arbor
PMC08R252AM1035	★	Y	2	25	10.5	18	58.7	39.7	35	6	14	M10	1.5	40.5°	35°	0.1	JOM□080320 ZZSR-□□	SC20M10S □□□□W
PMC09R323AM1245	★	Y	3	32	12.5	21	72.5	50.5	45	6	19	M12	3	40.5°	35°	0.2	JDM□09T320 ZDSR-□□	SC25M12S □□□□W
PMC12R403AM1645	★	Y	3	40	17	29	74.4	51.4	45	6	24	M16	3.5	42°	35°	0.3	JDM□120420 ZDSR-□□	SC32M16S □□□□W

*1 Y=Yes *2 Clamp Torque of the Head(lbf-ft) : M10=33.8, M12=59.2, M16=66.7 *3 WT : Mass

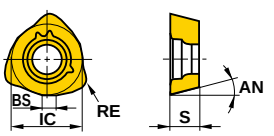
SPARE PARTS

Order Number	* Clamp Bridge Screw	Clamp Bridge	* Clamp Screw	Spring	Wrench	Anti-seize Lubricant
PMC08R252AM1035	TS33	AMS3	AJS3010T10	ASS2	②TKY08D ①TKY10R	MK1KS
PMC09R323AM1245	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	MK1KS
PMC12R403AM1645	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	MK1KS

* Clamp Torque (lbf-in) : TS33=8.9, TS351=22, TS43=31, AJS3010T10=22, AJS4012T15=31

INSERTS

Shape	Order Number	Class	Coated FH7020	VP15TF	VP30RT	Dimensions (mm) AN	IC	S	BS	RE	PMC holder	Geometry
FT Breaker	**JOMW080320ZZSR-FT**	M	●	●	●	13°	8	3.18	1.4	2	PMC08R252AM1035	
	JDMW09T320ZDSR-FT	M	●	●	●	15°	9.525	3.97	1.8	2	PMC09R323AM1245	
	JDMW120420ZDSR-FT	M	●	●	●	15°	12	4.76	2.5	2	PMC12R403AM1645	
ST Breaker	**JDMT120420ZDSR-ST**	M	●	●	●	15°	12	4.76	2.5	2	PMC12R403AM1645	
JM Breaker	**JOMT080320ZZSR-JM**	M	●	●	●	13°	8	3.18	1.4	2	PMC08R252AM1035	
	JDMT09T320ZDSR-JM	M	●	●	●	15°	9.525	3.97	1.8	2	PMC09R323AM1245	
	JDMT120420ZDSR-JM	M	●	●	●	15°	12	4.76	2.5	2	PMC12R403AM1645	



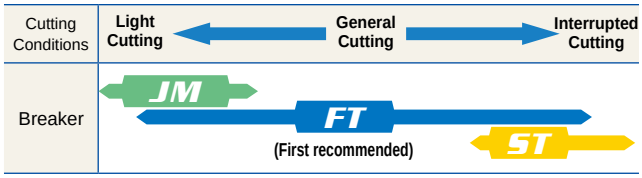
● : Inventory maintained. ★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

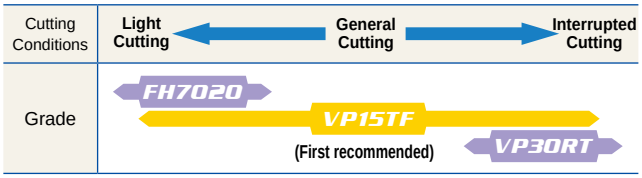
	Work Material	Hardness	Grade	Breaker	Cutting Dia. (mm)	Number of Teeth	Cutting Speed (SFM)	Feed per Tooth (inch/tooth)	Width of Cut (inch)	Pick Feed (inch)
P	Carbon Steel Alloy Steel	≤180HB	**VP15TF**	**FT**	ϕ40	3	820 (655—985)	—.024	—.059	—.236
					ϕ32	3	655 (490—720)	—.022	—.047	—.197
					ϕ25	2	655 (490—720)	—.022	—.039	—.197
	Hardening Tool Steel for Cold Work Dies	≤300HB	**VP15TF**	**FT**	ϕ40	3	820 (655—985)	—.022	—.059	—.197
					ϕ32	3	590 (490—655)	—.020	—.047	—.118
					ϕ25	2	590 (490—655)	—.020	—.039	—.118
	Alloy Tool Steel	≤300HB	**VP15TF**	**FT**	ϕ40	3	655 (330—985)	—.022	—.059	—.197
					ϕ32	3	490 (260—655)	—.020	—.047	—.118
					ϕ25	2	490 (260—655)	—.020	—.039	—.118
K	Cast Iron	Tensile Strength ≤350MPa	**VP15TF**	**FT**	ϕ40	3	820 (655—985)	—.024	—.059	—.236
					ϕ32	3	655 (490—720)	—.022	—.047	—.197
					ϕ25	2	655 (490—720)	—.022	—.039	—.197
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF**	**FT**	ϕ40	3	820 (655—985)	—.024	—.059	—.236
					ϕ32	3	655 (490—720)	—.022	—.047	—.197
					ϕ25	2	655 (490—720)	—.022	—.039	—.197

(Note 1) The above cutting conditions are general guide lines. Adjustments maybe necessary depending on machine rigidity, workpiece geometry and clamping.
(Note 2) A carbide shank extension is recommended to prevent vibrations.

Application of Breakers



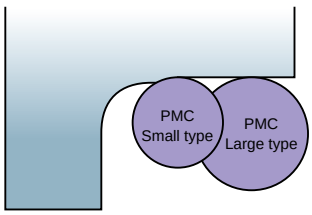
Application of Insert Grades

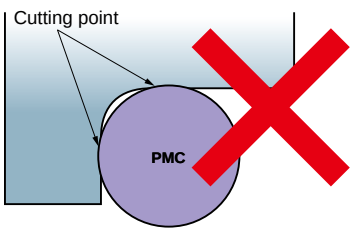


NOTES ON MACHINING METHODS

●How to choose an appropriate diameter tool.

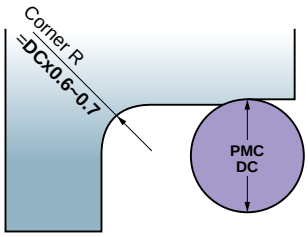
Machine plain surfaces with a larger tool and corner radii with smaller diameter cutters.





●Relation of the cutter diameter and corner R size of work piece

A guide for the smallest possible workpiece radius that can be machined is from 0.6—0.7 x diameter of the tool.



Tool diameter **DC**(mm)	Corner R (inch)
ϕ25	R≥.689
ϕ32	R≥.866
ϕ40	R≥.945

* Adjust cutting conditions according to the set up.
* Smaller workpiece corner radii (only >0.5 x cutter ϕ) may be possible by reducing the width of cut, speed and pick feed.

SCREW-IN ARBORS ➤ K162
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

VERTICAL FEED MILLING

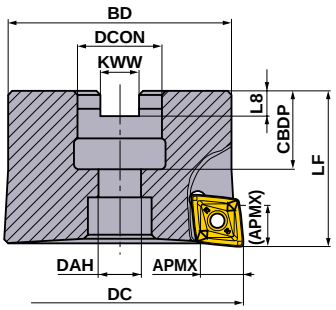
Roughing

PMR

P M K N S H



- 1 directional cutting with large overhang.
- Unique shape of curved edge gives high rigidity and low resistance.



Right hand tool holder only.

	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	DCON	CBDP	DAH	BD	KWW	L8	APMX	Insert
Metric	PMR405003A22R	★	3	50	40	22	20	11	45	10.4	6.3	11	CPMT1205ZPEN-M2/3
	PMR406304A22R	★	4	63	40	22	20	11	57	10.4	6.3	11	CPMT1205ZPEN-M2/3
	PMR408005A27R	★	5	80	50	27	23	13	73	12.4	7	11	CPMT1205ZPEN-M2/3
Inch	PMR405003BR	★	3	50	40	22.225	19	11	45	8.4	5	11	CPMT1205ZPEN-M2/3
	PMR406304BR	★	4	63	40	22.225	19	11	57	8.4	5	11	CPMT1205ZPEN-M2/3
	PMR408005DR	★	5	80	63	31.75	32	17	73	12.7	8	11	CPMT1205ZPEN-M2/3

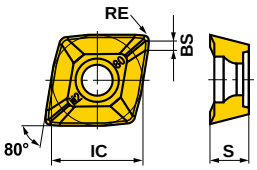


SPARE PARTS

Order Number	Shim	Shim Screw *	Insert Screw *	Wrench (Insert)	Wrench (Shim)	Set Bolt
PMR405003A22R	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
PMR406304A22R	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
PMR408005A27R	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC12040
PMR405003BR	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
PMR406304BR	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
PMR408005DR	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC16040

★ Clamp Torque (lbf-in) : WCS503507H=44, TPS35=31

INSERTS

Shape	Order Number	Class	Coated VP15TF	Dimensions (mm) IC	S	BS	RE	Geometry
	CPMT1205ZPEN-M2	M	●	12.7	5.56	1.4	0.8	
	CPMT1205ZPEN-M3	M	★	12.7	5.56	1.4	1.2	

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed per Tooth (inch/tooth)	pf (mm)
P	Carbon Steel Alloy Steel	180−280HB	VP15TF	590 (490−655)	.008 (.004−.012)	≤.5DC
		280−380HB				
K	Gray Cast Iron	Tensile Strength ≤350MPa	VP15TF	590 (490−655)	.008 (.004−.012)	≤.5DC
	Ductile Cast Iron	Tensile Strength 360−500MPa	VP15TF	490 (390−555)	.008 (.004−.012)	≤.5DC
		Tensile Strength 500−800MPa	VP15TF	390 (330−490)	.008 (.004−.012)	≤.5DC

(Note 1) The above conditions are suitable for general machining purposes, it is possible to use conditions that are different from the above.
(Note 2) For horizontal feed machining, please reduce the feed rate by 20−40%.
(Note 3) If vibration occurs when machining, please reduce the depth of cut, cutting speed by 20−50%.

● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

ARBORS ➤ K162

VERTICAL FEED MILLING

Finishing

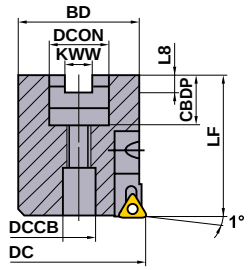
PMF

P M K N S H

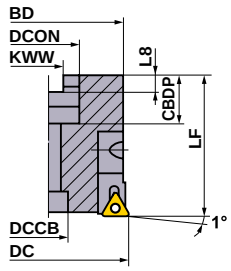


- 2 directional cutting with large overhang.
- No burring so no need for hand finishing.
- High precision multi directional insert ensures highly accurate surfaces.

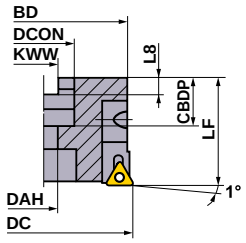
ø50



ø63



ø80



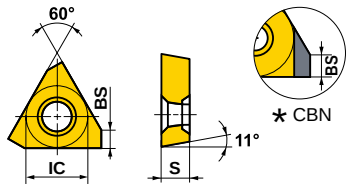
METRIC Standard

Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (mm)									Max. Allowable Revolution (min^{-1})		Cartridge	Insert Screw ✶2	Radial Screw	Set Bolt (Cartridge) ✶2	Wrench	Wrench	Set Bolt ①②	Insert
	R		DC	LF	DCON	CBDP	DAH	DCCB	KWW	L8	BD	Balance Unknown	G40 ✶1 Balanced								
PMF05004A22R	●	4	50	63	22	20	—	12	10.4	6.3	48	6300	12700	PMFA13R	TS254	TSS04005	HBH06012	TKY08F	HKY40R HKY50R	①HDS10031	TPEW 1303 ZP□R2
PMF06306A22R	●	6	63	63	22	20	—	18	10.4	6.3	60	5000	10100	PMFA13R	TS254	TSS04005	HBH06012	TKY08F	HKY40R	②HSC10050	
PMF08008A27R	●	8	80	50	27	23	13.5	—	12.4	7	75	3900	7900	PMFA13R	TS254	TSS04005	HBH06012	TKY08F	HKY40R	②HSC12035	

✶1 You need to balance the tool and holder together so that it confirms to G40 or higher standards.
✶2 Clamp Torque (lbf-in) : TS254=8.9, HBH06012=8.5

INSERTS

Shape	Order Number	Class	Coated VP15TF	Coated AP10H		CBN MB710		Dimensions (mm) IC	S	BS	Geometry
	TPEW1303ZPER2	E	●	●				7.94	3.18	2	
	TPEW1303ZPTR2	E				●		7.94	3.18	2	

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed per Tooth (inch/tooth)
P	Carbon Steel Alloy Steel	180—280HB	VP15TF	820 (490—1150)	.004 (.0019—.006)
		280—380HB	VP15TF	655 (330—985)	
K	Gray Cast Iron	Tensile Strength ≤350MPa	AP10H	1150 (655—1640)	.004 (.0019—.006)
			MB710	4920 (3280—6560)	

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed per Tooth (inch/tooth)
K	Dactile Cast Iron	Tensile Strength ≤500MPa	AP10H	820 (490—1150)	.004 (.002—.006)
			MB710	3280 (2625—3940)	
		Tensile Strength ≤800MPa	AP10H	655 (330—985)	.004 (.002—.006)
			MB710	3280 (2625—3940)	

(Note 1) Recommended radial depth of cut is .004" to .008"(1—2mm).
(Note 2) Up and down vertical cutting is recommended for efficiency.
(Note 3) For crossfeed cutting, feed per tooth should be reduced to less than .002(inch/tooth).

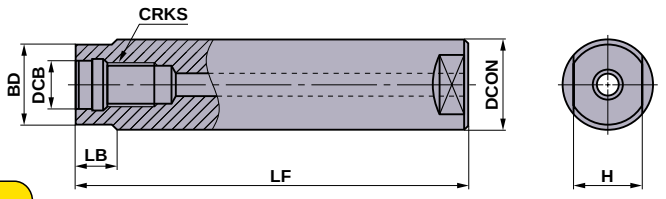
● : Inventory maintained.
<10 inserts in one case> <1 insert in one case for CBN>

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

SCREW-IN ARBORS

STRAIGHT SHANK ARBOR

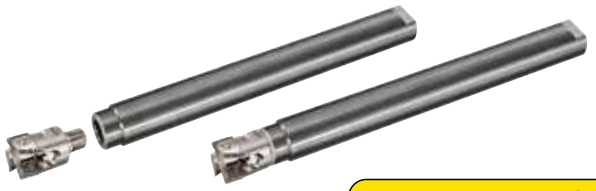


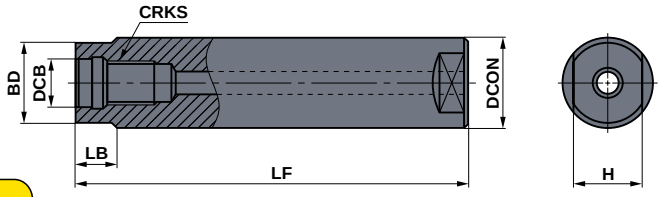


STEEL SHANK TYPE

METRIC Standard

Type	Order Number	Stock	Coolant Thru ★1	Dimensions (mm)							WT ★2 (kg)
				DCB	DCON	BD	LF	LB	H	CRKS	
Steel Shank	SC16M08S100S	★	Y	8.5	16	14.5	100	10	10	M8	0.1
	SC16M08S200L	★	Y	8.5	16	14.5	200	10	10	M8	0.3
	SC20M10S120S	★	Y	10.5	20	18.5	120	10	14	M10	0.3
	SC20M10S220L	★	Y	10.5	20	18.5	220	10	14	M10	0.5
	SC25M12S125S	★	Y	12.5	25	23.5	125	10	19	M12	0.4
	SC25M12S245L	★	Y	12.5	25	23.5	245	10	19	M12	0.8
	SC32M16S140S	★	Y	17	32	28.5	140	15	24	M16	0.8
	SC32M16S280L	★	Y	17	32	28.5	280	15	24	M16	1.6





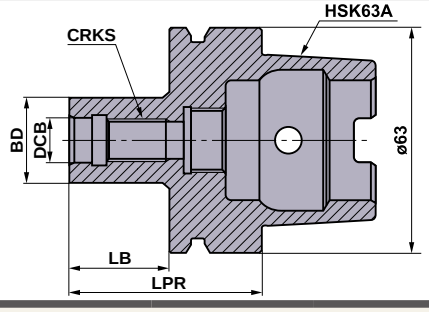
CARBIDE SHANK TYPE

METRIC Standard

Type	Order Number	Stock	Coolant Thru ★1	Dimensions (mm)							WT ★2 (kg)
				DCB	DCON	BD	LF	LB	H	CRKS	
Carbide Shank	SC16M08S100SW	★	Y	8.5	16	14.5	100	10	10	M8	0.2
	SC16M08S200LW	★	Y	8.5	16	14.5	200	10	10	M8	0.5
	SC20M10S120SW	★	Y	10.5	20	18.5	120	10	14	M10	0.5
	SC20M10S220LW	★	Y	10.5	20	18.5	220	10	14	M10	0.9
	SC25M12S125SW	★	Y	12.5	25	23.5	125	10	19	M12	0.8
	SC25M12S245LW	★	Y	12.5	25	23.5	245	10	19	M12	1.5
	SC32M16S140SW	★	Y	17	32	28.5	140	15	24	M16	1.4
	SC32M16S280LW	★	Y	17	32	28.5	280	15	24	M16	2.8

HSK SHANK ARBOR





HSK63A SHANK ARBOR

METRIC Standard

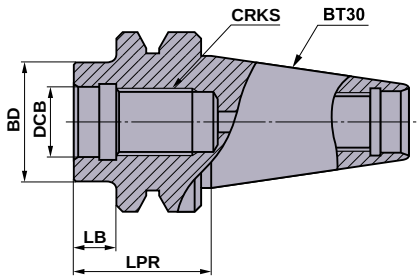
Order Number	Stock	Coolant Thru ★1	Dimensions (mm)					WT ★2 (kg)
			DCB	BD	LPR	LB	CRKS	
SC16M08S22-HSK63A	★	Y	8.5	14.5	48	22	M8	0.7
SC20M10S24-HSK63A	★	Y	10.5	18.5	50	24	M10	0.7
SC25M12S27-HSK63A	★	Y	12.5	23.5	53	27	M12	0.7
SC32M16S28-HSK63A	★	Y	17.0	28.5	54	28	M16	0.8

★1 Y=Yes ★2 WT : Mass

★ : Inventory maintained in Japan.

BT SHANK ARBOR





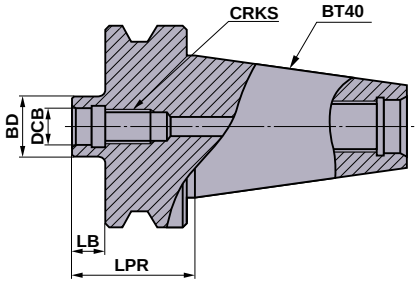
BT30 SHANK ARBOR

METRIC Standard

Order Number	Stock	Coolant Thru ✶1	Dimensions (mm)					WT (kg) ✶2
			DCB	BD	LPR	LB	CRKS	
SC16M08S10-BT30	★	Y	8.5	14.5	32	10	M8	0.4
SC20M10S10-BT30	★	Y	10.5	18.5	32	10	M10	0.4
SC25M12S10-BT30	★	Y	12.5	23.5	32	10	M12	0.4
SC32M16S10-BT30	★	Y	17.0	28.5	32	10	M16	0.4

✶1 Y=Yes ✶2 WT : Mass





BT40 SHANK ARBOR

METRIC Standard

Order Number	Stock	Coolant Thru ✶1	Dimensions (mm)					WT (kg) ✶2
			DCB	BD	LPR	LB	CRKS	
SC16M08S10-BT40	★	Y	8.5	14.5	37	10	M8	1.0
SC20M10S10-BT40	★	Y	10.5	18.5	37	10	M10	1.0
SC25M12S10-BT40	★	Y	12.5	23.5	37	10	M12	1.0
SC32M16S10-BT40	★	Y	17.0	28.5	37	10	M16	1.0

✶1 Y=Yes ✶2 WT : Mass

HOW TO INSTALL THE SCREW-IN HEAD

①Thoroughly clean the clamp section of the head and the arbor with an air blower or brush before installation.

②Tighten the head at the recommended torque and ensure that there is no gap between the head and arbor.



Screw Size	Recommended Torque (lbf-ft)	Wrench Size (mm)
M8	17.1	10
M10	33.8	14
M12	59.2	19
M16	66.7	24

- Cutting tools become extremely hot during cutting. Never touch them with bare hands after operation as this may produce risk of injuries or burns.
- Do not handle the cutting tools with bare hands as this may cause injuries.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

MAXIMUM SPINDLE SPEED FOR CUTTER

Diameter	WSX445		ASX445		AHX640S		AHX640W		AOX445	
	Max. Spindle Speed (min^{-1})	Clamp Torque (lbf-in)	Max. Spindle Speed (min^{-1})	Clamp Torque (lbf-in)	Max. Spindle Speed (min^{-1})	Clamp Torque (lbf-in)	Max. Spindle Speed (min^{-1})	Clamp Torque (lbf-in)	Max. Spindle Speed (min^{-1})	Clamp Torque (lbf-in)
1.5"	19000	31								
2.0"	17000	31	18000	31					13000	71
2.5"	15000	31	16000	31	11800	44.3			12000	71
3.0"	14000	31	14000	31	10000	44.3	9200	53	11000	71
4.0"	12000	31	13000	31	8600	44.3	7700	53	9300	71
5.0"	11000	31	12000	31	7300	44.3	6500	53	8300	71
6.0"	9500	31	10000	31	6400	44.3	5500	53	7200	71
8.0"	8500	31	9000	31	5000	44.3	4000	53	6400	71
10.0"			8000	31			2800	53		
12.0"							1900	53		

Diameter	ASX400		AXD4000		AXD7000		BXD4000		PMF	
	Max. Spindle Speed (min^{-1})	Clamp Torque (lbf-in)	Max. Spindle Speed (min^{-1})	Clamp Torque (lbf-in)	Max. Spindle Speed (min^{-1})	Clamp Torque (lbf-in)	Max. Spindle Speed (min^{-1})	Clamp Torque (lbf-in)	Max. Spindle Speed (min^{-1})	Clamp Torque (lbf-in)
1.0"			49000	13.3			38000	35		
1.25"			48000	13.3	41000	31	33000	35		
1.5"			41000	13.3	36000	31	29000	35		
2.0"	18000	31	35000	13.3	30000	31	24000	35	12700	8.9
2.5"	16000	31	30000	13.3	25000	31	21000	35	10100	8.9
3.0"	14000	31	27000	13.3	23000	31	19000	35	7900	8.9
4.0"	13000	31	23000	13.3	19000	31	16000	35		
5.0"	12000	31	20000	13.3	16000	31				
6.0"	10000	31								
8.0"	9000	31								
10.0"	8000	31								
12.0"										

All values shown on this chart are based on the insert being properly seated in pocket and torqued to the recommended values.
(Note) You need to balance the tool and holder together so that it confirms to G40 or higher standards.

Memo

GUIDE TO DRILLING TOOLS

●Section organization

①Organized according to cutting mode for drilling. (Refer to DRILL LIST.)

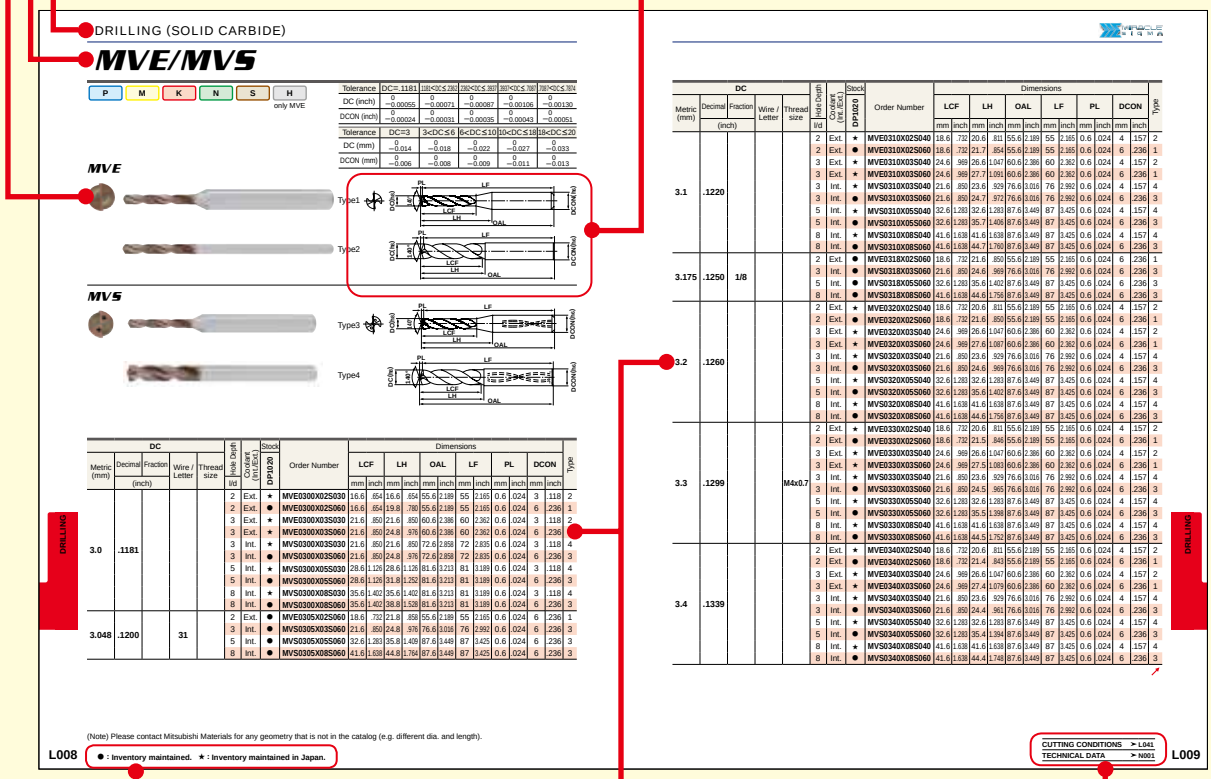


PHOTO OF PRODUCT

PRODUCT TYPE

PRODUCT SECTION

GEOMETRY

PRODUCT STANDARDS
indicates diameters, order numbers, stock status, numbers of teeth, dimensions, and spare parts for the title product.

PAGE REFERENCE
·TECHNICAL DATA
indicates the reference pages, including the above, on the right hand page of each double-page spread.

LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

●To Order: For solid-carbide drill or brazed drill, please specify order number and grade.
For indexable type drill, please specify order number for drill.
For indexable type drill insert, please specify insert number and insert grade.

DRILLING TOOLS

DRILL SELECTION CHART ····· L002

DRILL STANDARD

●SOLID CARBIDE TYPE

MVE/MVS DRILLS ····· L006
MWE/MWS DRILLS ····· L046
MMS DRILLS ····· L098
MHS DRILLS ····· L110
MNS DRILLS ····· L130
MAE/MAS DRILLS ····· L140
MSE DRILLS ····· L148
MSP DRILLS ····· L151
MICRO-MZE/MZS DRILLS ····· L154
MICRO-MGS DRILLS (SOLID GUN DRILLS) ····· L162
MHE (DRILLS FOR WHEEL HUB) ····· L165
MCS DRILLS ····· L166

●INDEXABLE TYPE

MVX DRILLS ····· L168
TAF DRILLS ····· L182
STAW DRILLS ····· L192
TAW DRILLS ····· L202

●BRAZED TYPE

BRA DRILLS ····· L216
BRS DRILLS ····· L218

*Arranged by Alphabetical order

L216 **BRA (INCH)**
L218 **BRS (INCH)**
L142 **MAE (METRIC)**
L140 **MAS (INCH)**
L142 **MAS (METRIC)**
L166 **MCS (INCH)**
L163 **MGD (INCH)**
L162 **MGS (METRIC)**
L165 **MHE**
L110 **MHS (METRIC)**
L098 **MMS (INCH/METRIC)**
L130 **MNS (METRIC)**
L148 **MSE (METRIC)**
L151 **MSP (METRIC)**
L008 **MVE (INCH/METRIC)**
L008 **MVS (INCH/METRIC)**
L006 **MVS (MICRO, METRIC)**
L168 **MVX (INCH)**
L172 **MVX (METRIC)**
L046 **MWE (INCH/METRIC)**
L046 **MWS (INCH/METRIC)**
L154 **MZE (MICRO, INCH)**
L156 **MZE (MICRO, METRIC)**
L192 **STAW (METRIC)**
L182 **TAF (INCH)**
L185 **TAF (METRIC)**
L202 **TAW (INCH)**
L208 **TAW (METRIC)**

Note: Dimension symbols conforming to ISO13399. See pages PR3-PR6 for details.

DRILL SELECTION CHART

Drill Structure	Category	Drill Type	Product Code	Coolant	LU INCH	LU METRIC	Range of Size	Work Material P Carbon Steel Alloy Steel	Work Material M Stainless Steel	Work Material K Cast Iron	Work Material N Light Alloy	Work Material S Heat-resistant Alloy	Work Material H Hardened Steel	Page Dimensions	Page Cutting Conditions	Shape
Solid Carbide	For Micro Size Hole (≤ϕ.1200", ϕ2.95mm)	New Generation for small diameter	NEW MVS MIRACLE SIGMA	Internal	—	2 7 12 20 25 30	**METRIC** ϕ1.0—ϕ2.9 mm	◎	◎	◎	○	○		L006	L043	
		General Use	MWS	Internal	1 5 12	1 5 12 20 25 30	**INCH** ϕ.0200"—ϕ.1200" **METRIC** ϕ0.5—ϕ2.95 mm	◎	◎	◎	○	○		L047	L090	
			MZE	External	2	2 3	**INCH** ϕ.0394"—ϕ.1200" **METRIC** ϕ1.0—ϕ2.9 mm	◎	○	◎	○	○	○	L154 L156	L159	
			MZS	Internal	5	3 5	**INCH** ϕ.0394"—ϕ.1200" **METRIC** ϕ1.0—ϕ2.9 mm	◎	◎	◎	○	○		L154 L156	L161	
			MSE	External	—	5	**METRIC** ϕ0.1—ϕ0.99 mm	◎	○	◎	○	○	○	L148	L149	
		Starter Drill for MSE Type	MSP	External	—	—	**METRIC** ϕ0.1—ϕ3.0 mm	◎	◎	◎	◎	○	◎	L151	L151	
	For General Size Hole (≥ϕ.1200", ϕ3.0mm)	New Generation	MVE MIRACLE SIGMA	External	2 3	2 3	**INCH** ϕ.1200"—ϕ.7874" **METRIC** ϕ3.0—ϕ20.0 mm	◎	○	◎	○	○	○	L008	L041	
			MVS MIRACLE SIGMA	Internal	3 5 8	3 5 8	**INCH** ϕ.1200"—ϕ.7874" **METRIC** ϕ3.0—ϕ20.0 mm	◎	◎	◎	○	○		L008	L043	
		General Use	MWE	External	—	2 3	**METRIC** ϕ3.0—ϕ20.0 mm	◎	○	◎	○	○	○	L057	L088	
			MWS	Internal	5 8	3 5 8	**INCH** ϕ.1250"—ϕ.7874" **METRIC** ϕ3.0—ϕ25.0 mm	◎	◎	◎	○	○		L057 L057	L090	

Drill Structure	Category	Drill Type	Product Code	Coolant	LU		Range of Size	Work Material						Page		Shape
					INCH	METRIC		P Carbon Steel Alloy Steel	M Stainless Steel	K Cast Iron	N Light Alloy	S Heat-resistant Alloy	H Hardened Steel	Dimensions	Cutting Conditions	
Solid Carbide	For Deep Hole (≥ l/d 10)	MWS Super Long Type	MWS	Internal	15 20 25 30	10 15 20 25 30	**INCH** ϕ.1250"−ϕ.5000" **METRIC** ϕ3.0−ϕ14.0 mm	◎	◎	◎	○	○		L057 L057	L092	
		Solid Gun Drill	MGS	Internal	–	20 – 80	**METRIC** ϕ0.7−ϕ3.0 mm	◎	◎	◎	◎	○	○	L162	L163	
	For Stainless Steel	2 coolant holes	MMS	Internal	–	3 5	**METRIC** ϕ3.0−ϕ20.0 mm		◎					L098	L107	
	For Aluminum or Cast Iron	Helix Angle (10°)	MAE	External	–	3	**METRIC** ϕ3.0−ϕ16.0 mm			○	◎			L142	L147	
			MAS	Internal	3	3 6	**INCH** ϕ.1250"−ϕ.7812" **METRIC** ϕ3.0−ϕ16.0 mm			○	◎			L140 L142	L141 L147	
		4 coolant holes	MNS	Internal	–	5 10 20 30	**METRIC** ϕ3.0−ϕ14.0 mm				◎			L130	L135	
	For Hardened Steel	General Use	MHS	Internal	–	1 – 30	**METRIC** ϕ0.95−ϕ12.0 mm	○	○			○	◎	L110	L126	
	For Wheel Hub	Low Cutting Resistance	MHE	External	1	–	**INCH** ϕ.3937"−ϕ.5906"	◎						L165	L165	
	For CFRP	CVD Diamond Coating	MCS	Internal	–	3	**INCH** ϕ.1719"−ϕ.5010"	For CFRP						L166	L167	

DRILL SELECTION CHART

Drill Structure	Category	Drill Type	Product Code	Coolant	LU		Range of Size	Work Material						Page		Shape
					INCH	METRIC		P Carbon Steel Alloy Steel	M Stainless Steel	K Cast Iron	N Light Alloy	S Heat-resistant Alloy	H Hardened Steel	Dimensions	Cutting Conditions	
Indexable	For General Use	Indexable Head	STAW	Internal	–	1.5 3 5 8	**METRIC** ϕ10.0—ϕ18.4 mm	◎	○	◎	○			L192	L200	
			TAW	Internal	3 5 8	3 5 8	**INCH** ϕ.5625"—ϕ1.1875" **METRIC** ϕ18.5—ϕ30.0 mm	◎	◎	◎				L202 L208	L210	
		Multi-corner Insert	TAF	Internal	2 3 4	2 3 4	**INCH** ϕ.4680"—ϕ2.2500" **METRIC** ϕ12.0—ϕ56.0 mm	◎	◎	◎	◎			L182 L185	L190	
	New Generation		MVX	Internal	2 – 6	2 – 6	**INCH** ϕ.6870"—ϕ2.5000" **METRIC** ϕ17.0—ϕ63.0 mm	◎	○	◎				L168 L172	L180	
Brazed	For General Use	New Point Type	BRA	Internal	3	3	**INCH** ϕ.3125"—ϕ1.2500" **METRIC** ϕ8.0—ϕ30.0 mm	◎	○	○				L216 L217	L217	
		High Helix (30°)	BRS	Internal	3	3	**INCH** ϕ.5000"—ϕ1.1875" **METRIC** ϕ14.0—ϕ30.0 mm	◎	◎	○				L218 L219	L219	

Memo

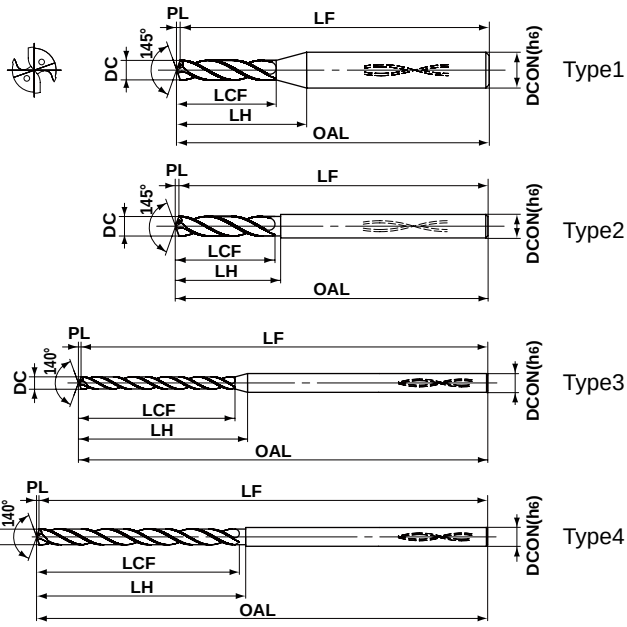
MICRO-MVS

- Straight cutting edge profile improves both chip evacuation and cutting edge strength.
- Double margin offers excellent straightness and high precision.

P M K N S H

Tolerance		1≤DC≤2.9
DC (mm)	MVS-X02-	+0.014 0
	Other than MVS-X02	0 −0.014
DCON (mm)	MVS	0 −0.006





(Internal coolant)

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
1.0	2	●	MVS0100X02S030	5.2	8.9	55.2	55	0.2	3	1
	7	●	MVS0100X07S030	10.2	14.2	55.2	55	0.2	3	3
	12	●	MVS0100X12S030	15.2	19.2	55.2	55	0.2	3	3
	20	●	MVS0100X20S030	24.2	28.2	60.2	60	0.2	3	3
	25	●	MVS0100X25S030	28.2	32.2	66.2	66	0.2	3	3
	30	●	MVS0100X30S030	33.2	37.2	72.2	72	0.2	3	3
1.1	2	●	MVS0110X02S030	5.6	9.1	55.2	55	0.2	3	1
	7	●	MVS0110X07S030	11.2	15.2	55.2	55	0.2	3	3
	12	●	MVS0110X12S030	17.2	21.2	55.2	55	0.2	3	3
	20	●	MVS0110X20S030	25.2	29.2	60.2	60	0.2	3	3
	25	●	MVS0110X25S030	31.2	34.2	66.2	66	0.2	3	3
	30	●	MVS0110X30S030	36.2	40.2	72.2	72	0.2	3	3
1.2	2	●	MVS0120X02S030	6.2	9.6	55.2	55	0.2	3	1
	7	●	MVS0120X07S030	12.2	15.2	55.2	55	0.2	3	3
	12	●	MVS0120X12S030	18.2	21.2	55.2	55	0.2	3	3
	20	●	MVS0120X20S030	28.2	31.2	60.2	60	0.2	3	3
	25	●	MVS0120X25S030	34.2	37.2	66.2	66	0.2	3	3
	30	●	MVS0120X30S030	40.2	43.2	72.2	72	0.2	3	3
1.3	2	●	MVS0130X02S030	6.6	9.8	55.2	55	0.2	3	1
	7	●	MVS0130X07S030	13.2	16.2	55.2	55	0.2	3	3
	12	●	MVS0130X12S030	20.2	23.2	55.2	55	0.2	3	3
	20	●	MVS0130X20S030	30.2	33.2	68.2	68	0.2	3	3
	25	●	MVS0130X25S030	36.2	40.2	74.2	74	0.2	3	3
	30	●	MVS0130X30S030	43.2	46.2	82.2	82	0.2	3	3

(Internal coolant)

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
1.4	2	●	MVS0140X02S030	7.2	10.2	55.2	55	0.2	3	1
	7	●	MVS0140X07S030	14.3	17.3	55.3	55	0.3	3	3
	12	●	MVS0140X12S030	21.3	24.3	55.3	55	0.3	3	3
	20	●	MVS0140X20S030	32.3	35.3	68.3	68	0.3	3	3
	25	●	MVS0140X25S030	39.3	42.3	74.3	74	0.3	3	3
	30	●	MVS0140X30S030	46.3	49.3	82.3	82	0.3	3	3
1.5	2	●	MVS0150X02S030	7.6	10.4	55.2	55	0.2	3	1
	7	●	MVS0150X07S030	15.3	18.3	55.3	55	0.3	3	3
	12	●	MVS0150X12S030	23.3	26.3	55.3	55	0.3	3	3
	20	●	MVS0150X20S030	35.3	37.3	68.3	68	0.3	3	3
	25	●	MVS0150X25S030	42.3	45.3	74.3	74	0.3	3	3
	30	●	MVS0150X30S030	50.3	52.3	82.3	82	0.3	3	3
1.6	2	●	MVS0160X02S030	8.3	10.9	68.3	68	0.3	3	1
	7	●	MVS0160X07S030	16.3	19.3	68.3	68	0.3	3	3
	12	●	MVS0160X12S030	24.3	27.3	68.3	68	0.3	3	3
	20	●	MVS0160X20S030	37.3	39.3	78.3	78	0.3	3	3
	25	●	MVS0160X25S030	45.3	47.3	86.3	86	0.3	3	3
	30	●	MVS0160X30S030	53.3	55.3	95.3	95	0.3	3	3
1.7	2	●	MVS0170X02S030	8.7	11.1	68.3	68	0.3	3	1
	7	●	MVS0170X07S030	17.3	19.3	68.3	68	0.3	3	3
	12	●	MVS0170X12S030	26.3	28.3	68.3	68	0.3	3	3
	20	●	MVS0170X20S030	39.3	42.3	78.3	78	0.3	3	3
	25	●	MVS0170X25S030	48.3	50.3	86.3	86	0.3	3	3
	30	●	MVS0170X30S030	56.3	59.3	95.3	95	0.3	3	3

(Note) The coolant hole of ø5.9mm or less will be round shape.

● : **Inventory maintained.**

(Internal coolant)

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
1.8	2	●	MVS0180X02S030	9.3	11.5	68.3	68	0.3	3	1
	7	●	MVS0180X07S030	18.3	20.3	68.3	68	0.3	3	3
	12	●	MVS0180X12S030	27.3	29.3	68.3	68	0.3	3	3
	20	●	MVS0180X20S030	41.3	44.3	84.3	84	0.3	3	3
	25	●	MVS0180X25S030	50.3	53.3	94.3	94	0.3	3	3
	30	●	MVS0180X30S030	59.3	62.3	102.3	102	0.3	3	3
1.9	2	●	MVS0190X02S030	9.7	11.8	68.3	68	0.3	3	1
	7	●	MVS0190X07S030	19.3	21.3	68.3	68	0.3	3	3
	12	●	MVS0190X12S030	29.3	31.3	68.3	68	0.3	3	3
	20	●	MVS0190X20S030	44.3	46.3	84.3	84	0.3	3	3
	25	●	MVS0190X25S030	53.3	55.3	94.3	94	0.3	3	3
	30	●	MVS0190X30S030	63.3	65.3	102.3	102	0.3	3	3
2.0	2	●	MVS0200X02S030	10.3	12.2	68.3	68	0.3	3	1
	7	●	MVS0200X07S030	20.4	22.4	68.4	68	0.4	3	3
	12	●	MVS0200X12S030	30.4	32.4	68.4	68	0.4	3	3
	20	●	MVS0200X20S030	46.4	48.4	84.4	84	0.4	3	3
	25	●	MVS0200X25S030	56.4	58.4	94.4	94	0.4	3	3
	30	●	MVS0200X30S030	66.4	68.4	102.4	102	0.4	3	3
2.1	2	●	MVS0210X02S030	10.7	12.4	74.3	74	0.3	3	1
	7	●	MVS0210X07S030	21.4	23.4	74.4	74	0.4	3	3
	12	●	MVS0210X12S030	32.4	34.4	74.4	74	0.4	3	3
	20	●	MVS0210X20S030	48.4	50.4	94.4	94	0.4	3	3
	25	●	MVS0210X25S030	59.4	60.4	107.4	107	0.4	3	3
	30	●	MVS0210X30S030	69.4	71.4	118.4	118	0.4	3	3
2.2	2	●	MVS0220X02S030	11.3	12.8	74.3	74	0.3	3	1
	7	●	MVS0220X07S030	22.4	23.4	74.4	74	0.4	3	3
	12	●	MVS0220X12S030	33.4	34.4	74.4	74	0.4	3	3
	20	●	MVS0220X20S030	51.4	52.4	94.4	94	0.4	3	3
	25	●	MVS0220X25S030	62.4	63.4	107.4	107	0.4	3	3
	30	●	MVS0220X30S030	73.4	74.4	118.4	118	0.4	3	3
2.3	2	●	MVS0230X02S030	11.8	13.1	74.4	74	0.4	3	1
	7	●	MVS0230X07S030	23.4	24.4	74.4	74	0.4	3	3
	12	●	MVS0230X12S030	35.4	36.4	74.4	74	0.4	3	3
	20	●	MVS0230X20S030	53.4	54.4	94.4	94	0.4	3	3
	25	●	MVS0230X25S030	64.4	66.4	107.4	107	0.4	3	3
	30	●	MVS0230X30S030	76.4	77.4	118.4	118	0.4	3	3
2.4	2	●	MVS0240X02S030	12.4	13.5	74.4	74	0.4	3	1
	7	●	MVS0240X07S030	24.4	25.4	74.4	74	0.4	3	3
	12	●	MVS0240X12S030	36.4	37.4	74.4	74	0.4	3	3
	20	●	MVS0240X20S030	55.4	56.4	94.4	94	0.4	3	3
	25	●	MVS0240X25S030	67.4	68.4	107.4	107	0.4	3	3
	30	●	MVS0240X30S030	79.4	80.4	118.4	118	0.4	3	3
2.5	2	●	MVS0250X02S030	12.8	13.7	74.4	74	0.4	3	1
	7	●	MVS0250X07S030	25.5	26.5	74.5	74	0.5	3	3
	12	●	MVS0250X12S030	38.5	39.5	74.5	74	0.5	3	3
	20	●	MVS0250X20S030	58.5	59.5	94.5	94	0.5	3	3
	25	●	MVS0250X25S030	70.5	71.5	107.5	107	0.5	3	3
	30	●	MVS0250X30S030	83.5	84.5	118.5	118	0.5	3	3

(Note) The coolant hole of ø5.9mm or less will be round shape.

(Internal coolant)

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
2.6	2	●	MVS0260X02S030	13.4	13.4	81.4	81	0.4	3	2
	7	●	MVS0260X07S030	26.5	26.5	81.5	81	0.5	3	4
	12	●	MVS0260X12S030	39.5	39.5	81.5	81	0.5	3	4
	20	●	MVS0260X20S030	60.5	60.5	103.5	103	0.5	3	4
	25	●	MVS0260X25S030	73.5	73.5	117.5	117	0.5	3	4
	30	●	MVS0260X30S030	86.5	86.5	132.5	132	0.5	3	4
2.7	2	●	MVS0270X02S030	13.8	13.8	81.4	81	0.4	3	2
	7	●	MVS0270X07S030	27.5	27.5	81.5	81	0.5	3	4
	12	●	MVS0270X12S030	41.5	41.5	81.5	81	0.5	3	4
	20	●	MVS0270X20S030	62.5	62.5	103.5	103	0.5	3	4
	25	●	MVS0270X25S030	76.5	76.5	117.5	117	0.5	3	4
	30	●	MVS0270X30S030	89.5	89.5	132.5	132	0.5	3	4
2.8	2	●	MVS0280X02S030	14.4	14.4	81.4	81	0.4	3	2
	7	●	MVS0280X07S030	28.5	28.5	81.5	81	0.5	3	4
	12	●	MVS0280X12S030	42.5	42.5	81.5	81	0.5	3	4
	20	●	MVS0280X20S030	64.5	64.5	103.5	103	0.5	3	4
	25	●	MVS0280X25S030	78.5	78.5	117.5	117	0.5	3	4
	30	●	MVS0280X30S030	92.5	92.5	132.5	132	0.5	3	4
2.9	2	●	MVS0290X02S030	14.9	14.9	81.5	81	0.5	3	2
	7	●	MVS0290X07S030	29.5	29.5	81.5	81	0.5	3	4
	12	●	MVS0290X12S030	44.5	44.5	81.5	81	0.5	3	4
	20	●	MVS0290X20S030	67.5	67.5	103.5	103	0.5	3	4
	25	●	MVS0290X25S030	81.5	81.5	117.5	117	0.5	3	4
	30	●	MVS0290X30S030	96.5	96.5	132.5	132	0.5	3	4

CUTTING CONDITIONS ➤ L043
TECHNICAL DATA ➤ N001

MVE/MVS

P M K N S H

only MVE

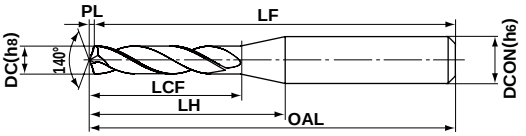
Tolerance	DC=.1181	.1181<DC≤.2362	.2362<DC≤.3937	.3937<DC≤.7087	.7087<DC≤.7874
DC (inch)	0 −0.00055	0 −0.00071	0 −0.00087	0 −0.00106	0 −0.00130
DCON (inch)	0 −0.00024	0 −0.00031	0 −0.00035	0 −0.00043	0 −0.00051

Tolerance	DC=3	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤20
DC (mm)	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
DCON (mm)	0 −0.006	0 −0.008	0 −0.009	0 −0.011	0 −0.013

MVE

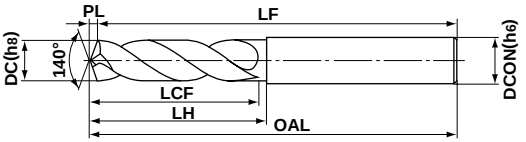


Type1





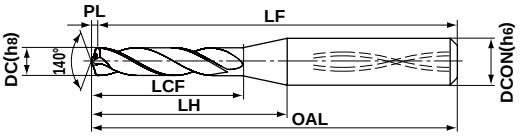
Type2



MVS

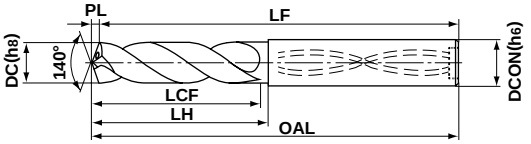


Type3





Type4



DC: Metric (mm)	DC: Decimal (inch)	DC: Fraction (inch)	Wire / Letter	Thread size	Hole Depth l/d	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions LCF mm	LCF inch	LH mm	LH inch	OAL mm	OAL inch	LF mm	LF inch	PL mm	PL inch	DCON mm	DCON inch	Type
3.0	.1181				2	Ext.	★	MVE0300X02S030	16.6	.654	16.6	.654	55.6	2.189	55	2.165	0.6	.024	3	.118	2
					2	Ext.	●	MVE0300X02S060	16.6	.654	19.8	.780	55.6	2.189	55	2.165	0.6	.024	6	.236	1
					3	Ext.	★	MVE0300X03S030	21.6	.850	21.6	.850	60.6	2.386	60	2.362	0.6	.024	3	.118	2
					3	Ext.	★	MVE0300X03S060	21.6	.850	24.8	.976	60.6	2.386	60	2.362	0.6	.024	6	.236	1
					3	Int.	★	MVS0300X03S030	21.6	.850	21.6	.850	72.6	2.858	72	2.835	0.6	.024	3	.118	4
					3	Int.	●	MVS0300X03S060	21.6	.850	24.8	.976	72.6	2.858	72	2.835	0.6	.024	6	.236	3
					5	Int.	★	MVS0300X05S030	28.6	1.126	28.6	1.126	81.6	3.213	81	3.189	0.6	.024	3	.118	4
					5	Int.	●	MVS0300X05S060	28.6	1.126	31.8	1.252	81.6	3.213	81	3.189	0.6	.024	6	.236	3
					8	Int.	★	MVS0300X08S030	35.6	1.402	35.6	1.402	81.6	3.213	81	3.189	0.6	.024	3	.118	4
					8	Int.	●	MVS0300X08S060	35.6	1.402	38.8	1.528	81.6	3.213	81	3.189	0.6	.024	6	.236	3
3.048	.1200		31		2	Ext.	●	MVE0305X02S060	18.6	.732	21.8	.858	55.6	2.189	55	2.165	0.6	.024	6	.236	1
					3	Int.	●	MVS0305X03S060	21.6	.850	24.8	.976	76.6	3.016	76	2.992	0.6	.024	6	.236	3
					5	Int.	●	MVS0305X05S060	32.6	1.283	35.8	1.409	87.6	3.449	87	3.425	0.6	.024	6	.236	3
					8	Int.	●	MVS0305X08S060	41.6	1.638	44.8	1.764	87.6	3.449	87	3.425	0.6	.024	6	.236	3

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
3.1	.1220				2	Ext.	★	MVE0310X02S040	18.6	.732	20.6	.811	55.6	2.189	55	2.165	0.6	.024	4	.157	2
					2	Ext.	●	MVE0310X02S060	18.6	.732	21.7	.854	55.6	2.189	55	2.165	0.6	.024	6	.236	1
					3	Ext.	★	MVE0310X03S040	24.6	.969	26.6	1.047	60.6	2.386	60	2.362	0.6	.024	4	.157	2
					3	Ext.	★	MVE0310X03S060	24.6	.969	27.7	1.091	60.6	2.386	60	2.362	0.6	.024	6	.236	1
					3	Int.	★	MVS0310X03S040	21.6	.850	23.6	.929	76.6	3.016	76	2.992	0.6	.024	4	.157	4
					3	Int.	●	MVS0310X03S060	21.6	.850	24.7	.972	76.6	3.016	76	2.992	0.6	.024	6	.236	3
					5	Int.	★	MVS0310X05S040	32.6	1.283	32.6	1.283	87.6	3.449	87	3.425	0.6	.024	4	.157	4
					5	Int.	●	MVS0310X05S060	32.6	1.283	35.7	1.406	87.6	3.449	87	3.425	0.6	.024	6	.236	3
					8	Int.	★	MVS0310X08S040	41.6	1.638	41.6	1.638	87.6	3.449	87	3.425	0.6	.024	4	.157	4
					8	Int.	●	MVS0310X08S060	41.6	1.638	44.7	1.760	87.6	3.449	87	3.425	0.6	.024	6	.236	3
3.175	.1250	1/8			2	Ext.	●	MVE0318X02S060	18.6	.732	21.6	.850	55.6	2.189	55	2.165	0.6	.024	6	.236	1
					3	Int.	●	MVS0318X03S060	21.6	.850	24.6	.969	76.6	3.016	76	2.992	0.6	.024	6	.236	3
					5	Int.	●	MVS0318X05S060	32.6	1.283	35.6	1.402	87.6	3.449	87	3.425	0.6	.024	6	.236	3
					8	Int.	●	MVS0318X08S060	41.6	1.638	44.6	1.756	87.6	3.449	87	3.425	0.6	.024	6	.236	3
3.2	.1260				2	Ext.	★	MVE0320X02S040	18.6	.732	20.6	.811	55.6	2.189	55	2.165	0.6	.024	4	.157	2
					2	Ext.	●	MVE0320X02S060	18.6	.732	21.6	.850	55.6	2.189	55	2.165	0.6	.024	6	.236	1
					3	Ext.	★	MVE0320X03S040	24.6	.969	26.6	1.047	60.6	2.386	60	2.362	0.6	.024	4	.157	2
					3	Ext.	★	MVE0320X03S060	24.6	.969	27.6	1.087	60.6	2.386	60	2.362	0.6	.024	6	.236	1
					3	Int.	★	MVS0320X03S040	21.6	.850	23.6	.929	76.6	3.016	76	2.992	0.6	.024	4	.157	4
					3	Int.	●	MVS0320X03S060	21.6	.850	24.6	.969	76.6	3.016	76	2.992	0.6	.024	6	.236	3
					5	Int.	★	MVS0320X05S040	32.6	1.283	32.6	1.283	87.6	3.449	87	3.425	0.6	.024	4	.157	4
					5	Int.	●	MVS0320X05S060	32.6	1.283	35.6	1.402	87.6	3.449	87	3.425	0.6	.024	6	.236	3
					8	Int.	★	MVS0320X08S040	41.6	1.638	41.6	1.638	87.6	3.449	87	3.425	0.6	.024	4	.157	4
					8	Int.	●	MVS0320X08S060	41.6	1.638	44.6	1.756	87.6	3.449	87	3.425	0.6	.024	6	.236	3
3.3	.1299			M4x0.7	2	Ext.	★	MVE0330X02S040	18.6	.732	20.6	.811	55.6	2.189	55	2.165	0.6	.024	4	.157	2
					2	Ext.	●	MVE0330X02S060	18.6	.732	21.5	.846	55.6	2.189	55	2.165	0.6	.024	6	.236	1
					3	Ext.	★	MVE0330X03S040	24.6	.969	26.6	1.047	60.6	2.386	60	2.362	0.6	.024	4	.157	2
					3	Ext.	★	MVE0330X03S060	24.6	.969	27.5	1.083	60.6	2.386	60	2.362	0.6	.024	6	.236	1
					3	Int.	★	MVS0330X03S040	21.6	.850	23.6	.929	76.6	3.016	76	2.992	0.6	.024	4	.157	4
					3	Int.	●	MVS0330X03S060	21.6	.850	24.5	.965	76.6	3.016	76	2.992	0.6	.024	6	.236	3
					5	Int.	★	MVS0330X05S040	32.6	1.283	32.6	1.283	87.6	3.449	87	3.425	0.6	.024	4	.157	4
					5	Int.	●	MVS0330X05S060	32.6	1.283	35.5	1.398	87.6	3.449	87	3.425	0.6	.024	6	.236	3
					8	Int.	★	MVS0330X08S040	41.6	1.638	41.6	1.638	87.6	3.449	87	3.425	0.6	.024	4	.157	4
					8	Int.	●	MVS0330X08S060	41.6	1.638	44.5	1.752	87.6	3.449	87	3.425	0.6	.024	6	.236	3
3.4	.1339				2	Ext.	★	MVE0340X02S040	18.6	.732	20.6	.811	55.6	2.189	55	2.165	0.6	.024	4	.157	2
					2	Ext.	●	MVE0340X02S060	18.6	.732	21.4	.843	55.6	2.189	55	2.165	0.6	.024	6	.236	1
					3	Ext.	★	MVE0340X03S040	24.6	.969	26.6	1.047	60.6	2.386	60	2.362	0.6	.024	4	.157	2
					3	Ext.	★	MVE0340X03S060	24.6	.969	27.4	1.079	60.6	2.386	60	2.362	0.6	.024	6	.236	1
					3	Int.	★	MVS0340X03S040	21.6	.850	23.6	.929	76.6	3.016	76	2.992	0.6	.024	4	.157	4
					3	Int.	●	MVS0340X03S060	21.6	.850	24.4	.961	76.6	3.016	76	2.992	0.6	.024	6	.236	3
					5	Int.	★	MVS0340X05S040	32.6	1.283	32.6	1.283	87.6	3.449	87	3.425	0.6	.024	4	.157	4
					5	Int.	●	MVS0340X05S060	32.6	1.283	35.4	1.394	87.6	3.449	87	3.425	0.6	.024	6	.236	3
					8	Int.	★	MVS0340X08S040	41.6	1.638	41.6	1.638	87.6	3.449	87	3.425	0.6	.024	4	.157	4
					8	Int.	●	MVS0340X08S060	41.6	1.638	44.4	1.748	87.6	3.449	87	3.425	0.6	.024	6	.236	3

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

MVE/MVS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
3.5	.1378				2	Ext.	★	MVE0350X02S040	18.6	.732	20.6	.811	55.6	2.189	55	2.165	0.6	.024	4	.157	2
					2	Ext.	●	MVE0350X02S060	18.6	.732	21.3	.839	55.6	2.189	55	2.165	0.6	.024	6	.236	1
					3	Ext.	★	MVE0350X03S040	24.6	.969	26.6	1.047	60.6	2.386	60	2.362	0.6	.024	4	.157	2
					3	Ext.	★	MVE0350X03S060	24.6	.969	27.3	1.075	60.6	2.386	60	2.362	0.6	.024	6	.236	1
					3	Int.	★	MVS0350X03S040	21.6	.850	23.6	.929	76.6	3.016	76	2.992	0.6	.024	4	.157	4
					3	Int.	●	MVS0350X03S060	21.6	.850	24.3	.957	76.6	3.016	76	2.992	0.6	.024	6	.236	3
					5	Int.	★	MVS0350X05S040	32.6	1.283	32.6	1.283	87.6	3.449	87	3.425	0.6	.024	4	.157	4
					5	Int.	●	MVS0350X05S060	32.6	1.283	35.3	1.390	87.6	3.449	87	3.425	0.6	.024	6	.236	3
					8	Int.	★	MVS0350X08S040	41.6	1.638	41.6	1.638	87.6	3.449	87	3.425	0.6	.024	4	.157	4
					8	Int.	●	MVS0350X08S060	41.6	1.638	44.3	1.744	87.6	3.449	87	3.425	0.6	.024	6	.236	3
3.572	.1406	9/64			2	Ext.	●	MVE0357X02S060	20.7	.815	23.3	.917	55.7	2.193	55	2.165	0.7	.028	6	.236	1
					3	Int.	●	MVS0357X03S060	23.7	.933	26.3	1.035	80.7	3.177	80	3.150	0.7	.028	6	.236	3
					5	Int.	●	MVS0357X05S060	36.7	1.445	39.3	1.547	92.7	3.650	92	3.622	0.7	.028	6	.236	3
					8	Int.	●	MVS0357X08S060	46.7	1.839	49.3	1.941	92.7	3.650	92	3.622	0.7	.028	6	.236	3
3.6	.1417				2	Ext.	★	MVE0360X02S040	20.7	.815	20.7	.815	55.7	2.193	55	2.165	0.7	.028	4	.157	2
					2	Ext.	●	MVE0360X02S060	20.7	.815	23.3	.917	55.7	2.193	55	2.165	0.7	.028	6	.236	1
					3	Ext.	★	MVE0360X03S040	27.7	1.091	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	4	.157	2
					3	Ext.	★	MVE0360X03S060	27.7	1.091	30.3	1.193	60.7	2.390	60	2.362	0.7	.028	6	.236	1
					3	Int.	★	MVS0360X03S040	23.7	.933	23.7	.933	80.7	3.177	80	3.150	0.7	.028	4	.157	4
					3	Int.	●	MVS0360X03S060	23.7	.933	26.3	1.035	80.7	3.177	80	3.150	0.7	.028	6	.236	3
					5	Int.	★	MVS0360X05S040	36.7	1.445	36.7	1.445	92.7	3.650	92	3.622	0.7	.028	4	.157	4
					5	Int.	●	MVS0360X05S060	36.7	1.445	39.3	1.547	92.7	3.650	92	3.622	0.7	.028	6	.236	3
					8	Int.	★	MVS0360X08S040	46.7	1.839	46.7	1.839	92.7	3.650	92	3.622	0.7	.028	4	.157	4
					8	Int.	●	MVS0360X08S060	46.7	1.839	49.3	1.941	92.7	3.650	92	3.622	0.7	.028	6	.236	3
3.7	.1457			M4.5x0.75	2	Ext.	★	MVE0370X02S040	20.7	.815	20.7	.815	55.7	2.193	55	2.165	0.7	.028	4	.157	2
					2	Ext.	●	MVE0370X02S060	20.7	.815	23.2	.913	55.7	2.193	55	2.165	0.7	.028	6	.236	1
					3	Ext.	★	MVE0370X03S040	27.7	1.091	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	4	.157	2
					3	Ext.	★	MVE0370X03S060	27.7	1.091	30.2	1.189	60.7	2.390	60	2.362	0.7	.028	6	.236	1
					3	Int.	★	MVS0370X03S040	23.7	.933	23.7	.933	80.7	3.177	80	3.150	0.7	.028	4	.157	4
					3	Int.	●	MVS0370X03S060	23.7	.933	26.2	1.031	80.7	3.177	80	3.150	0.7	.028	6	.236	3
					5	Int.	★	MVS0370X05S040	36.7	1.445	36.7	1.445	92.7	3.650	92	3.622	0.7	.028	4	.157	4
					5	Int.	●	MVS0370X05S060	36.7	1.445	39.2	1.543	92.7	3.650	92	3.622	0.7	.028	6	.236	3
					8	Int.	★	MVS0370X08S040	46.7	1.839	46.7	1.839	92.7	3.650	92	3.622	0.7	.028	4	.157	4
					8	Int.	●	MVS0370X08S060	46.7	1.839	49.2	1.937	92.7	3.650	92	3.622	0.7	.028	6	.236	3
3.8	.1496		25	#10-24	2	Ext.	★	MVE0380X02S040	20.7	.815	20.7	.815	55.7	2.193	55	2.165	0.7	.028	4	.157	2
					2	Ext.	●	MVE0380X02S060	20.7	.815	23.1	.909	55.7	2.193	55	2.165	0.7	.028	6	.236	1
					3	Ext.	★	MVE0380X03S040	27.7	1.091	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	4	.157	2
					3	Ext.	★	MVE0380X03S060	27.7	1.091	30.1	1.185	60.7	2.390	60	2.362	0.7	.028	6	.236	1
					3	Int.	★	MVS0380X03S040	23.7	.933	23.7	.933	80.7	3.177	80	3.150	0.7	.028	4	.157	4
					3	Int.	●	MVS0380X03S060	23.7	.933	26.1	1.028	80.7	3.177	80	3.150	0.7	.028	6	.236	3
					5	Int.	★	MVS0380X05S040	36.7	1.445	36.7	1.445	92.7	3.650	92	3.622	0.7	.028	4	.157	4
					5	Int.	●	MVS0380X05S060	36.7	1.445	39.1	1.539	92.7	3.650	92	3.622	0.7	.028	6	.236	3
					8	Int.	★	MVS0380X08S040	46.7	1.839	46.7	1.839	92.7	3.650	92	3.622	0.7	.028	4	.157	4
					8	Int.	●	MVS0380X08S060	46.7	1.839	49.1	1.933	92.7	3.650	92	3.622	0.7	.028	6	.236	3

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
3.9	.1535				2	Ext.	★	MVE0390X02S040	20.7	.815	20.7	.815	55.7	2.193	55	2.165	0.7	.028	4	.157	2
					2	Ext.	●	MVE0390X02S060	20.7	.815	23.0	.906	55.7	2.193	55	2.165	0.7	.028	6	.236	1
					3	Ext.	★	MVE0390X03S040	27.7	1.091	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	4	.157	2
					3	Ext.	★	MVE0390X03S060	27.7	1.091	30.0	1.181	60.7	2.390	60	2.362	0.7	.028	6	.236	1
					3	Int.	★	MVS0390X03S040	23.7	.933	23.7	.933	80.7	3.177	80	3.150	0.7	.028	4	.157	4
					3	Int.	●	MVS0390X03S060	23.7	.933	26.0	1.024	80.7	3.177	80	3.150	0.7	.028	6	.236	3
					5	Int.	★	MVS0390X05S040	36.7	1.445	36.7	1.445	92.7	3.650	92	3.622	0.7	.028	4	.157	4
					5	Int.	●	MVS0390X05S060	36.7	1.445	39.0	1.535	92.7	3.650	92	3.622	0.7	.028	6	.236	3
					8	Int.	★	MVS0390X08S040	46.7	1.839	46.7	1.839	92.7	3.650	92	3.622	0.7	.028	4	.157	4
					8	Int.	●	MVS0390X08S060	46.7	1.839	49.0	1.929	92.7	3.650	92	3.622	0.7	.028	6	.236	3
3.969	.1562	5/32			2	Ext.	●	MVE0397X02S060	20.7	.815	22.9	.902	55.7	2.193	55	2.165	0.7	.028	6	.236	1
					3	Int.	●	MVS0397X03S060	23.7	.933	25.9	1.020	80.7	3.177	80	3.150	0.7	.028	6	.236	3
					5	Int.	●	MVS0397X05S060	36.7	1.445	38.9	1.531	92.7	3.650	92	3.622	0.7	.028	6	.236	3
					8	Int.	●	MVS0397X08S060	46.7	1.839	48.9	1.925	92.7	3.650	92	3.622	0.7	.028	6	.236	3
4.0	.1575				2	Ext.	★	MVE0400X02S040	20.7	.815	20.7	.815	55.7	2.193	55	2.165	0.7	.028	4	.157	2
					2	Ext.	●	MVE0400X02S060	20.7	.815	22.8	.898	55.7	2.193	55	2.165	0.7	.028	6	.236	1
					3	Ext.	★	MVE0400X03S040	27.7	1.091	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	4	.157	2
					3	Ext.	★	MVE0400X03S060	27.7	1.091	29.8	1.173	60.7	2.390	60	2.362	0.7	.028	6	.236	1
					3	Int.	★	MVS0400X03S040	23.7	.933	23.7	.933	80.7	3.177	80	3.150	0.7	.028	4	.157	4
					3	Int.	●	MVS0400X03S060	23.7	.933	25.8	1.016	80.7	3.177	80	3.150	0.7	.028	6	.236	3
					5	Int.	★	MVS0400X05S040	36.7	1.445	36.7	1.445	92.7	3.650	92	3.622	0.7	.028	4	.157	4
					5	Int.	●	MVS0400X05S060	36.7	1.445	38.8	1.528	92.7	3.650	92	3.622	0.7	.028	6	.236	3
					8	Int.	★	MVS0400X08S040	46.7	1.839	46.7	1.839	92.7	3.650	92	3.622	0.7	.028	4	.157	4
					8	Int.	●	MVS0400X08S060	46.7	1.839	48.8	1.921	92.7	3.650	92	3.622	0.7	.028	6	.236	3
4.039	.1590		21	#10-32	2	Ext.	●	MVE0404X02S060	22.7	.894	24.8	.976	62.7	2.469	62	2.441	0.7	.028	6	.236	1
					3	Int.	●	MVS0404X03S060	25.7	1.012	27.8	1.094	86.7	3.413	86	3.386	0.7	.028	6	.236	3
					5	Int.	●	MVS0404X05S060	40.7	1.602	42.8	1.685	100.7	3.965	100	3.937	0.7	.028	6	.236	3
					8	Int.	●	MVS0404X08S060	52.7	2.075	54.8	2.157	100.7	3.965	100	3.937	0.7	.028	6	.236	3
4.1	.1614				2	Ext.	★	MVE0410X02S050	22.8	.898	24.8	.976	62.8	2.472	62	2.441	0.8	.031	5	.197	2
					2	Ext.	●	MVE0410X02S060	22.8	.898	24.8	.976	62.8	2.472	62	2.441	0.8	.031	6	.236	1
					3	Ext.	★	MVE0410X03S050	29.8	1.173	31.8	1.252	68.8	2.709	68	2.677	0.8	.031	5	.197	2
					3	Ext.	★	MVE0410X03S060	29.8	1.173	31.8	1.252	68.8	2.709	68	2.677	0.8	.031	6	.236	1
					3	Int.	★	MVS0410X03S050	25.8	1.016	25.8	1.016	86.8	3.417	86	3.386	0.8	.031	5	.197	4
					3	Int.	●	MVS0410X03S060	25.8	1.016	27.8	1.094	86.8	3.417	86	3.386	0.8	.031	6	.236	3
					5	Int.	★	MVS0410X05S050	40.8	1.606	40.8	1.606	100.8	3.969	100	3.937	0.8	.031	5	.197	4
					5	Int.	●	MVS0410X05S060	40.8	1.606	42.8	1.685	100.8	3.969	100	3.937	0.8	.031	6	.236	3
					8	Int.	★	MVS0410X08S050	52.8	2.079	52.8	2.079	100.8	3.969	100	3.937	0.8	.031	5	.197	4
					8	Int.	●	MVS0410X08S060	52.8	2.079	54.8	2.157	100.8	3.969	100	3.937	0.8	.031	6	.236	3

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

MVE/MVS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.2	.1654			M5x0.8	2	Ext.	★	MVE0420X02S050	22.8	.898	24.8	.976	62.8	2.472	62	2.441	0.8	.031	5	.197	2
					2	Ext.	●	MVE0420X02S060	22.8	.898	24.7	.972	62.8	2.472	62	2.441	0.8	.031	6	.236	1
					3	Ext.	★	MVE0420X03S050	29.8	1.173	31.8	1.252	68.8	2.709	68	2.677	0.8	.031	5	.197	2
					3	Ext.	★	MVE0420X03S060	29.8	1.173	31.7	1.248	68.8	2.709	68	2.677	0.8	.031	6	.236	1
					3	Int.	★	MVS0420X03S050	25.8	1.016	25.8	1.016	86.8	3.417	86	3.386	0.8	.031	5	.197	4
					3	Int.	●	MVS0420X03S060	25.8	1.016	27.7	1.091	86.8	3.417	86	3.386	0.8	.031	6	.236	3
					5	Int.	★	MVS0420X05S050	40.8	1.606	40.8	1.606	100.8	3.969	100	3.937	0.8	.031	5	.197	4
					5	Int.	●	MVS0420X05S060	40.8	1.606	42.7	1.681	100.8	3.969	100	3.937	0.8	.031	6	.236	3
					8	Int.	★	MVS0420X08S050	52.8	2.079	52.8	2.079	100.8	3.969	100	3.937	0.8	.031	5	.197	4
					8	Int.	●	MVS0420X08S060	52.8	2.079	54.7	2.154	100.8	3.969	100	3.937	0.8	.031	6	.236	3
4.3	.1693				2	Ext.	★	MVE0430X02S050	22.8	.898	24.8	.976	62.8	2.472	62	2.441	0.8	.031	5	.197	2
					2	Ext.	●	MVE0430X02S060	22.8	.898	24.6	.969	62.8	2.472	62	2.441	0.8	.031	6	.236	1
					3	Ext.	★	MVE0430X03S050	29.8	1.173	31.8	1.252	68.8	2.709	68	2.677	0.8	.031	5	.197	2
					3	Ext.	★	MVE0430X03S060	29.8	1.173	31.6	1.244	68.8	2.709	68	2.677	0.8	.031	6	.236	1
					3	Int.	★	MVS0430X03S050	25.8	1.016	25.8	1.016	86.8	3.417	86	3.386	0.8	.031	5	.197	4
					3	Int.	●	MVS0430X03S060	25.8	1.016	27.6	1.087	86.8	3.417	86	3.386	0.8	.031	6	.236	3
					5	Int.	★	MVS0430X05S050	40.8	1.606	40.8	1.606	100.8	3.969	100	3.937	0.8	.031	5	.197	4
					5	Int.	●	MVS0430X05S060	40.8	1.606	42.6	1.677	100.8	3.969	100	3.937	0.8	.031	6	.236	3
					8	Int.	★	MVS0430X08S050	52.8	2.079	52.8	2.079	100.8	3.969	100	3.937	0.8	.031	5	.197	4
					8	Int.	●	MVS0430X08S060	52.8	2.079	54.6	2.150	100.8	3.969	100	3.937	0.8	.031	6	.236	3
4.366	.1719	11/64			2	Ext.	●	MVE0437X02S060	22.8	.898	24.6	.969	62.8	2.472	62	2.441	0.8	.031	6	.236	1
					3	Int.	●	MVS0437X03S060	25.8	1.016	27.6	1.087	86.8	3.417	86	3.386	0.8	.031	6	.236	3
					5	Int.	●	MVS0437X05S060	40.8	1.606	42.6	1.677	100.8	3.969	100	3.937	0.8	.031	6	.236	3
					8	Int.	●	MVS0437X08S060	52.8	2.079	54.6	2.150	100.8	3.969	100	3.937	0.8	.031	6	.236	3
4.4	.1732				2	Ext.	★	MVE0440X02S050	22.8	.898	24.8	.976	62.8	2.472	62	2.441	0.8	.031	5	.197	2
					2	Ext.	●	MVE0440X02S060	22.8	.898	24.5	.965	62.8	2.472	62	2.441	0.8	.031	6	.236	1
					3	Ext.	★	MVE0440X03S050	29.8	1.173	31.8	1.252	68.8	2.709	68	2.677	0.8	.031	5	.197	2
					3	Ext.	★	MVE0440X03S060	29.8	1.173	31.5	1.240	68.8	2.709	68	2.677	0.8	.031	6	.236	1
					3	Int.	★	MVS0440X03S050	25.8	1.016	25.8	1.016	86.8	3.417	86	3.386	0.8	.031	5	.197	4
					3	Int.	●	MVS0440X03S060	25.8	1.016	27.5	1.083	86.8	3.417	86	3.386	0.8	.031	6	.236	3
					5	Int.	★	MVS0440X05S050	40.8	1.606	40.8	1.606	100.8	3.969	100	3.937	0.8	.031	5	.197	4
					5	Int.	●	MVS0440X05S060	40.8	1.606	42.5	1.673	100.8	3.969	100	3.937	0.8	.031	6	.236	3
					8	Int.	★	MVS0440X08S050	52.8	2.079	52.8	2.079	100.8	3.969	100	3.937	0.8	.031	5	.197	4
					8	Int.	●	MVS0440X08S060	52.8	2.079	54.5	2.146	100.8	3.969	100	3.937	0.8	.031	6	.236	3
4.5	.1772		16	#12-24	2	Ext.	★	MVE0450X02S050	22.8	.898	24.8	.976	62.8	2.472	62	2.441	0.8	.031	5	.197	2
					2	Ext.	●	MVE0450X02S060	22.8	.898	24.4	.961	62.8	2.472	62	2.441	0.8	.031	6	.236	1
					3	Ext.	★	MVE0450X03S050	29.8	1.173	31.8	1.252	68.8	2.709	68	2.677	0.8	.031	5	.197	2
					3	Ext.	★	MVE0450X03S060	29.8	1.173	31.4	1.236	68.8	2.709	68	2.677	0.8	.031	6	.236	1
					3	Int.	★	MVS0450X03S050	25.8	1.016	25.8	1.016	86.8	3.417	86	3.386	0.8	.031	5	.197	4
					3	Int.	●	MVS0450X03S060	25.8	1.016	27.4	1.079	86.8	3.417	86	3.386	0.8	.031	6	.236	3
					5	Int.	★	MVS0450X05S050	40.8	1.606	40.8	1.606	100.8	3.969	100	3.937	0.8	.031	5	.197	4
					5	Int.	●	MVS0450X05S060	40.8	1.606	42.4	1.669	100.8	3.969	100	3.937	0.8	.031	6	.236	3
					8	Int.	★	MVS0450X08S050	52.8	2.079	52.8	2.079	100.8	3.969	100	3.937	0.8	.031	5	.197	4
					8	Int.	●	MVS0450X08S060	52.8	2.079	54.4	2.142	100.8	3.969	100	3.937	0.8	.031	6	.236	3

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.6	.1811				2	Ext.	★	MVE0460X02S050	24.8	.976	24.8	.976	62.8	2.472	62	2.441	0.8	.031	5	.197	2
					2	Ext.	●	MVE0460X02S060	24.8	.976	27.8	1.094	62.8	2.472	62	2.441	0.8	.031	6	.236	2
					3	Ext.	★	MVE0460X03S050	32.8	1.291	32.8	1.291	68.8	2.709	68	2.677	0.8	.031	5	.197	2
					3	Ext.	★	MVE0460X03S060	32.8	1.291	35.8	1.409	68.8	2.709	68	2.677	0.8	.031	6	.236	2
					3	Int.	★	MVS0460X03S050	28.3	1.114	28.3	1.114	90.8	3.575	90	3.543	0.8	.031	5	.197	4
					3	Int.	●	MVS0460X03S060	28.3	1.114	31.3	1.232	90.8	3.575	90	3.543	0.8	.031	6	.236	4
					5	Int.	★	MVS0460X05S050	44.8	1.764	44.8	1.764	105.8	4.165	105	4.134	0.8	.031	5	.197	4
					5	Int.	●	MVS0460X05S060	44.8	1.764	47.8	1.882	105.8	4.165	105	4.134	0.8	.031	6	.236	4
					8	Int.	★	MVS0460X08S050	57.8	2.276	57.8	2.276	105.8	4.165	105	4.134	0.8	.031	5	.197	4
					8	Int.	●	MVS0460X08S060	57.8	2.276	60.8	2.394	105.8	4.165	105	4.134	0.8	.031	6	.236	4
4.7	.1850		13		2	Ext.	★	MVE0470X02S050	24.9	.980	24.9	.980	62.9	2.476	62	2.441	0.9	.035	5	.197	2
					2	Ext.	●	MVE0470X02S060	24.9	.980	27.9	1.098	62.9	2.476	62	2.441	0.9	.035	6	.236	2
					3	Ext.	★	MVE0470X03S050	32.9	1.295	32.9	1.295	68.9	2.713	68	2.677	0.9	.035	5	.197	2
					3	Ext.	★	MVE0470X03S060	32.9	1.295	35.9	1.413	68.9	2.713	68	2.677	0.9	.035	6	.236	2
					3	Int.	★	MVS0470X03S050	28.4	1.118	28.4	1.118	90.9	3.579	90	3.543	0.9	.035	5	.197	4
					3	Int.	●	MVS0470X03S060	28.4	1.118	31.4	1.236	90.9	3.579	90	3.543	0.9	.035	6	.236	4
					5	Int.	★	MVS0470X05S050	44.9	1.768	44.9	1.768	105.9	4.169	105	4.134	0.9	.035	5	.197	4
					5	Int.	●	MVS0470X05S060	44.9	1.768	47.9	1.886	105.9	4.169	105	4.134	0.9	.035	6	.236	4
					8	Int.	★	MVS0470X08S050	57.9	2.280	57.9	2.280	105.9	4.169	105	4.134	0.9	.035	5	.197	4
					8	Int.	●	MVS0470X08S060	57.9	2.280	60.9	2.398	105.9	4.169	105	4.134	0.9	.035	6	.236	4
4.763	.1875	3/16			2	Ext.	●	MVE0476X02S060	24.9	.980	27.9	1.098	62.9	2.476	62	2.441	0.9	.035	6	.236	2
					3	Int.	●	MVS0476X03S060	28.4	1.118	31.4	1.236	90.9	3.579	90	3.543	0.9	.035	6	.236	4
					5	Int.	●	MVS0476X05S060	44.9	1.768	47.9	1.886	105.9	4.169	105	4.134	0.9	.035	6	.236	4
					8	Int.	●	MVS0476X08S060	57.9	2.280	60.9	2.398	105.9	4.169	105	4.134	0.9	.035	6	.236	4
4.8	.1890		12		2	Ext.	★	MVE0480X02S050	24.9	.980	24.9	.980	62.9	2.476	62	2.441	0.9	.035	5	.197	2
					2	Ext.	●	MVE0480X02S060	24.9	.980	27.9	1.098	62.9	2.476	62	2.441	0.9	.035	6	.236	2
					3	Ext.	★	MVE0480X03S050	32.9	1.295	32.9	1.295	68.9	2.713	68	2.677	0.9	.035	5	.197	2
					3	Ext.	★	MVE0480X03S060	32.9	1.295	35.9	1.413	68.9	2.713	68	2.677	0.9	.035	6	.236	2
					3	Int.	★	MVS0480X03S050	28.4	1.118	28.4	1.118	90.9	3.579	90	3.543	0.9	.035	5	.197	4
					3	Int.	●	MVS0480X03S060	28.4	1.118	31.4	1.236	90.9	3.579	90	3.543	0.9	.035	6	.236	4
					5	Int.	★	MVS0480X05S050	44.9	1.768	44.9	1.768	105.9	4.169	105	4.134	0.9	.035	5	.197	4
					5	Int.	●	MVS0480X05S060	44.9	1.768	47.9	1.886	105.9	4.169	105	4.134	0.9	.035	6	.236	4
					8	Int.	★	MVS0480X08S050	57.9	2.280	57.9	2.280	105.9	4.169	105	4.134	0.9	.035	5	.197	4
					8	Int.	●	MVS0480X08S060	57.9	2.280	60.9	2.398	105.9	4.169	105	4.134	0.9	.035	6	.236	4
4.9	.1929				2	Ext.	★	MVE0490X02S050	24.9	.980	24.9	.980	62.9	2.476	62	2.441	0.9	.035	5	.197	2
					2	Ext.	●	MVE0490X02S060	24.9	.980	27.9	1.098	62.9	2.476	62	2.441	0.9	.035	6	.236	2
					3	Ext.	★	MVE0490X03S050	32.9	1.295	32.9	1.295	68.9	2.713	68	2.677	0.9	.035	5	.197	2
					3	Ext.	★	MVE0490X03S060	32.9	1.295	35.9	1.413	68.9	2.713	68	2.677	0.9	.035	6	.236	2
					3	Int.	★	MVS0490X03S050	28.4	1.118	28.4	1.118	90.9	3.579	90	3.543	0.9	.035	5	.197	4
					3	Int.	●	MVS0490X03S060	28.4	1.118	31.4	1.236	90.9	3.579	90	3.543	0.9	.035	6	.236	4
					5	Int.	★	MVS0490X05S050	44.9	1.768	44.9	1.768	105.9	4.169	105	4.134	0.9	.035	5	.197	4
					5	Int.	●	MVS0490X05S060	44.9	1.768	47.9	1.886	105.9	4.169	105	4.134	0.9	.035	6	.236	4
					8	Int.	★	MVS0490X08S050	57.9	2.280	57.9	2.280	105.9	4.169	105	4.134	0.9	.035	5	.197	4
					8	Int.	●	MVS0490X08S060	57.9	2.280	60.9	2.398	105.9	4.169	105	4.134	0.9	.035	6	.236	4

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

MVE/MVS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
5.0	.1969			M6x1.0	2	Ext.	★	MVE0500X02S050	24.9	.980	24.9	.980	62.9	2.476	62	2.441	0.9	.035	5	.197	2
					2	Ext.	●	MVE0500X02S060	24.9	.980	27.9	1.098	62.9	2.476	62	2.441	0.9	.035	6	.236	2
					3	Ext.	★	MVE0500X03S050	32.9	1.295	32.9	1.295	68.9	2.713	68	2.677	0.9	.035	5	.197	2
					3	Ext.	★	MVE0500X03S060	32.9	1.295	35.9	1.413	68.9	2.713	68	2.677	0.9	.035	6	.236	2
					3	Int.	★	MVS0500X03S050	28.4	1.118	28.4	1.118	90.9	3.579	90	3.543	0.9	.035	5	.197	4
					3	Int.	●	MVS0500X03S060	28.4	1.118	31.4	1.236	90.9	3.579	90	3.543	0.9	.035	6	.236	4
					5	Int.	★	MVS0500X05S050	44.9	1.768	44.9	1.768	105.9	4.169	105	4.134	0.9	.035	5	.197	4
					5	Int.	●	MVS0500X05S060	44.9	1.768	47.9	1.886	105.9	4.169	105	4.134	0.9	.035	6	.236	4
					8	Int.	★	MVS0500X08S050	57.9	2.280	57.9	2.280	105.9	4.169	105	4.134	0.9	.035	5	.197	4
					8	Int.	●	MVS0500X08S060	57.9	2.280	60.9	2.398	105.9	4.169	105	4.134	0.9	.035	6	.236	4
5.1	.2008		7	1/4-20	2	Ext.	●	MVE0510X02S060	26.9	1.059	28.9	1.138	66.9	2.634	66	2.598	0.9	.035	6	.236	2
					3	Ext.	★	MVE0510X03S060	34.9	1.374	36.9	1.453	74.9	2.949	74	2.913	0.9	.035	6	.236	2
					3	Int.	●	MVS0510X03S060	28.4	1.118	30.9	1.217	82.9	3.264	82	3.228	0.9	.035	6	.236	4
					5	Int.	●	MVS0510X05S060	44.9	1.768	48.9	1.925	100.9	3.972	100	3.937	0.9	.035	6	.236	4
					8	Int.	●	MVS0510X08S060	61.9	2.437	66.9	2.634	118.9	4.681	118	4.646	0.9	.035	6	.236	4
5.159	.2031	13/64			2	Ext.	●	MVE0516X02S060	26.9	1.059	28.9	1.138	66.9	2.634	66	2.598	0.9	.035	6	.236	2
					3	Int.	●	MVS0516X03S060	28.4	1.118	30.9	1.217	82.9	3.264	82	3.228	0.9	.035	6	.236	4
					5	Int.	●	MVS0516X05S060	44.9	1.768	48.9	1.925	100.9	3.972	100	3.937	0.9	.035	6	.236	4
					8	Int.	●	MVS0516X08S060	61.9	2.437	66.9	2.634	118.9	4.681	118	4.646	0.9	.035	6	.236	4
5.2	.2047				2	Ext.	●	MVE0520X02S060	27.0	1.063	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	6	.236	2
					3	Ext.	★	MVE0520X03S060	35.0	1.378	37.0	1.457	75.0	2.953	74	2.913	1.0	.039	6	.236	2
					3	Int.	●	MVS0520X03S060	28.5	1.122	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6	.236	4
					5	Int.	●	MVS0520X05S060	45.0	1.772	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6	.236	4
					8	Int.	●	MVS0520X08S060	62.0	2.441	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6	.236	4
5.3	.2087				2	Ext.	●	MVE0530X02S060	27.0	1.063	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	6	.236	2
					3	Ext.	★	MVE0530X03S060	35.0	1.378	37.0	1.457	75.0	2.953	74	2.913	1.0	.039	6	.236	2
					3	Int.	●	MVS0530X03S060	28.5	1.122	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6	.236	4
					5	Int.	●	MVS0530X05S060	45.0	1.772	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6	.236	4
					8	Int.	●	MVS0530X08S060	62.0	2.441	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6	.236	4
5.4	.2126		3	1/4-28	2	Ext.	●	MVE0540X02S060	27.0	1.063	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	6	.236	2
					3	Ext.	★	MVE0540X03S060	35.0	1.378	37.0	1.457	75.0	2.953	74	2.913	1.0	.039	6	.236	2
					3	Int.	●	MVS0540X03S060	28.5	1.122	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6	.236	4
					5	Int.	●	MVS0540X05S060	45.0	1.772	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6	.236	4
					8	Int.	●	MVS0540X08S060	62.0	2.441	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6	.236	4
5.5	.2165				2	Ext.	●	MVE0550X02S060	27.0	1.063	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	6	.236	2
					3	Ext.	★	MVE0550X03S060	35.0	1.378	37.0	1.457	75.0	2.953	74	2.913	1.0	.039	6	.236	2
					3	Int.	●	MVS0550X03S060	28.5	1.122	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6	.236	4
					5	Int.	●	MVS0550X05S060	45.0	1.772	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6	.236	4
					8	Int.	●	MVS0550X08S060	62.0	2.441	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6	.236	4
5.556	.2188	7/32			2	Ext.	●	MVE0556X02S060	29.0	1.142	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	6	.236	2
					3	Int.	●	MVS0556X03S060	31.0	1.220	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6	.236	4
					5	Int.	●	MVS0556X05S060	49.0	1.929	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6	.236	4
					8	Int.	●	MVS0556X08S060	67.0	2.638	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6	.236	4
5.6	.2205				2	Ext.	●	MVE0560X02S060	29.0	1.142	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	6	.236	2
					3	Ext.	★	MVE0560X03S060	37.0	1.457	37.0	1.457	75.0	2.953	74	2.913	1.0	.039	6	.236	2
					3	Int.	●	MVS0560X03S060	31.0	1.220	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6	.236	4
					5	Int.	●	MVS0560X05S060	49.0	1.929	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6	.236	4
					8	Int.	●	MVS0560X08S060	67.0	2.638	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6	.236	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	●	MVE0570X02S060	29.0	1.142	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	6	.236	2
					3	Ext.	★	MVE0570X03S060	37.0	1.457	37.0	1.457	75.0	2.953	74	2.913	1.0	.039	6	.236	2
5.7	**.2244**				3	Int.	●	MVS0570X03S060	31.0	1.220	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6	.236	4
					5	Int.	●	MVS0570X05S060	49.0	1.929	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6	.236	4
					8	Int.	●	MVS0570X08S060	67.0	2.638	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6	.236	4
					2	Ext.	●	MVE0580X02S060	29.1	1.146	29.1	1.146	67.1	2.642	66	2.598	1.1	.043	6	.236	2
					3	Ext.	★	MVE0580X03S060	37.1	1.461	37.1	1.461	75.1	2.957	74	2.913	1.1	.043	6	.236	2
5.8	**.2283**		**1**		3	Int.	●	MVS0580X03S060	31.1	1.224	31.1	1.224	83.1	3.272	82	3.228	1.1	.043	6	.236	4
					5	Int.	●	MVS0580X05S060	49.1	1.933	49.1	1.933	101.1	3.980	100	3.937	1.1	.043	6	.236	4
					8	Int.	●	MVS0580X08S060	67.1	2.642	67.1	2.642	119.1	4.689	118	4.646	1.1	.043	6	.236	4
					2	Ext.	●	MVE0590X02S060	29.1	1.146	29.1	1.146	67.1	2.642	66	2.598	1.1	.043	6	.236	2
					3	Ext.	★	MVE0590X03S060	37.1	1.461	37.1	1.461	75.1	2.957	74	2.913	1.1	.043	6	.236	2
5.9	**.2323**				3	Int.	●	MVS0590X03S060	31.1	1.224	31.1	1.224	83.1	3.272	82	3.228	1.1	.043	6	.236	4
					5	Int.	●	MVS0590X05S060	49.1	1.933	49.1	1.933	101.1	3.980	100	3.937	1.1	.043	6	.236	4
					8	Int.	●	MVS0590X08S060	67.1	2.642	67.1	2.642	119.1	4.689	118	4.646	1.1	.043	6	.236	4
					2	Ext.	●	MVE0595X02S060	29.1	1.146	29.1	1.146	67.1	2.642	66	2.598	1.1	.043	6	.236	2
5.953	**.2344**	**15/64**			3	Int.	●	MVS0595X03S060	31.1	1.224	31.1	1.224	83.1	3.272	82	3.228	1.1	.043	6	.236	4
					5	Int.	●	MVS0595X05S060	49.1	1.933	49.1	1.933	101.1	3.980	100	3.937	1.1	.043	6	.236	4
					8	Int.	●	MVS0595X08S060	67.1	2.642	67.1	2.642	119.1	4.689	118	4.646	1.1	.043	6	.236	4
					2	Ext.	●	MVE0600X02S060	29.1	1.146	29.1	1.146	67.1	2.642	66	2.598	1.1	.043	6	.236	2
					3	Ext.	★	MVE0600X03S060	37.1	1.461	37.1	1.461	75.1	2.957	74	2.913	1.1	.043	6	.236	2
6.0	**.2362**			**M7x1.0**	3	Int.	●	MVS0600X03S060	31.1	1.224	31.1	1.224	83.1	3.272	82	3.228	1.1	.043	6	.236	4
					5	Int.	●	MVS0600X05S060	49.1	1.933	49.1	1.933	101.1	3.980	100	3.937	1.1	.043	6	.236	4
					8	Int.	●	MVS0600X08S060	67.1	2.642	67.1	2.642	119.1	4.689	118	4.646	1.1	.043	6	.236	4
					2	Ext.	★	MVE0610X02S070	32.1	1.264	35.1	1.382	75.1	2.957	74	2.913	1.1	.043	7	.276	2
					2	Ext.	●	MVE0610X02S080	32.1	1.264	35.1	1.382	75.1	2.957	74	2.913	1.1	.043	8	.315	2
					3	Ext.	★	MVE0610X03S070	42.1	1.657	45.1	1.776	84.1	3.311	83	3.268	1.1	.043	7	.276	2
					3	Ext.	★	MVE0610X03S080	42.1	1.657	45.1	1.776	84.1	3.311	83	3.268	1.1	.043	8	.315	2
					3	Int.	★	MVS0610X03S070	33.6	1.323	36.1	1.421	89.1	3.508	88	3.465	1.1	.043	7	.276	4
6.1	**.2402**				3	Int.	●	MVS0610X03S080	33.6	1.323	36.1	1.421	89.1	3.508	88	3.465	1.1	.043	8	.315	4
					5	Int.	★	MVS0610X05S070	53.1	2.091	57.1	2.248	110.1	4.335	109	4.291	1.1	.043	7	.276	4
					5	Int.	●	MVS0610X05S080	53.1	2.091	57.1	2.248	110.1	4.335	109	4.291	1.1	.043	8	.315	4
					8	Int.	★	MVS0610X08S070	73.1	2.878	78.1	3.075	131.1	5.161	130	5.118	1.1	.043	7	.276	4
					8	Int.	●	MVS0610X08S080	73.1	2.878	78.1	3.075	131.1	5.161	130	5.118	1.1	.043	8	.315	4
					2	Ext.	★	MVE0620X02S070	32.1	1.264	35.1	1.382	75.1	2.957	74	2.913	1.1	.043	7	.276	2
					2	Ext.	●	MVE0620X02S080	32.1	1.264	35.1	1.382	75.1	2.957	74	2.913	1.1	.043	8	.315	2
					3	Ext.	★	MVE0620X03S070	42.1	1.657	45.1	1.776	84.1	3.311	83	3.268	1.1	.043	7	.276	2
					3	Ext.	★	MVE0620X03S080	42.1	1.657	45.1	1.776	84.1	3.311	83	3.268	1.1	.043	8	.315	2
					3	Int.	★	MVS0620X03S070	33.6	1.323	36.1	1.421	89.1	3.508	88	3.465	1.1	.043	7	.276	4
6.2	**.2441**				3	Int.	●	MVS0620X03S080	33.6	1.323	36.1	1.421	89.1	3.508	88	3.465	1.1	.043	8	.315	4
					5	Int.	★	MVS0620X05S070	53.1	2.091	57.1	2.248	110.1	4.335	109	4.291	1.1	.043	7	.276	4
					5	Int.	●	MVS0620X05S080	53.1	2.091	57.1	2.248	110.1	4.335	109	4.291	1.1	.043	8	.315	4
					8	Int.	★	MVS0620X08S070	73.1	2.878	78.1	3.075	131.1	5.161	130	5.118	1.1	.043	7	.276	4
					8	Int.	●	MVS0620X08S080	73.1	2.878	78.1	3.075	131.1	5.161	130	5.118	1.1	.043	8	.315	4

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

MVE/MVS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
6.3	.2480				2	Ext.	★	MVE0630X02S070	32.2	1.268	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	7	.276	2
					2	Ext.	●	MVE0630X02S080	32.2	1.268	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					3	Ext.	★	MVE0630X03S070	42.2	1.661	45.2	1.780	84.2	3.315	83	3.268	1.2	.047	7	.276	2
					3	Ext.	★	MVE0630X03S080	42.2	1.661	45.2	1.780	84.2	3.315	83	3.268	1.2	.047	8	.315	2
					3	Int.	★	MVS0630X03S070	33.7	1.327	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7	.276	4
					3	Int.	●	MVS0630X03S080	33.7	1.327	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	8	.315	4
					5	Int.	★	MVS0630X05S070	53.2	2.094	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7	.276	4
					5	Int.	●	MVS0630X05S080	53.2	2.094	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	8	.315	4
					8	Int.	★	MVS0630X08S070	73.2	2.882	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7	.276	4
					8	Int.	●	MVS0630X08S080	73.2	2.882	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	8	.315	4
6.350	.2500	1/4	E		2	Ext.	●	MVE0635X02S080	32.2	1.268	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					3	Int.	●	MVS0635X03S080	33.7	1.327	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	8	.315	4
					5	Int.	●	MVS0635X05S080	53.2	2.094	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	8	.315	4
					8	Int.	●	MVS0635X08S080	73.2	2.882	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	8	.315	4
6.4	.2520				2	Ext.	★	MVE0640X02S070	32.2	1.268	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	7	.276	2
					2	Ext.	●	MVE0640X02S080	32.2	1.268	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					3	Ext.	★	MVE0640X03S070	42.2	1.661	45.2	1.780	84.2	3.315	83	3.268	1.2	.047	7	.276	2
					3	Ext.	★	MVE0640X03S080	42.2	1.661	45.2	1.780	84.2	3.315	83	3.268	1.2	.047	8	.315	2
					3	Int.	★	MVS0640X03S070	33.7	1.327	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7	.276	4
					3	Int.	●	MVS0640X03S080	33.7	1.327	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	8	.315	4
					5	Int.	★	MVS0640X05S070	53.2	2.094	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7	.276	4
					5	Int.	●	MVS0640X05S080	53.2	2.094	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	8	.315	4
					8	Int.	★	MVS0640X08S070	73.2	2.882	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7	.276	4
					8	Int.	●	MVS0640X08S080	73.2	2.882	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	8	.315	4
6.5	.2559				2	Ext.	★	MVE0650X02S070	32.2	1.268	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	7	.276	2
					2	Ext.	●	MVE0650X02S080	32.2	1.268	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					3	Ext.	★	MVE0650X03S070	42.2	1.661	45.2	1.780	84.2	3.315	83	3.268	1.2	.047	7	.276	2
					3	Ext.	★	MVE0650X03S080	42.2	1.661	45.2	1.780	84.2	3.315	83	3.268	1.2	.047	8	.315	2
					3	Int.	★	MVS0650X03S070	33.7	1.327	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7	.276	4
					3	Int.	●	MVS0650X03S080	33.7	1.327	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	8	.315	4
					5	Int.	★	MVS0650X05S070	53.2	2.094	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7	.276	4
					5	Int.	●	MVS0650X05S080	53.2	2.094	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	8	.315	4
					8	Int.	★	MVS0650X08S070	73.2	2.882	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7	.276	4
					8	Int.	●	MVS0650X08S080	73.2	2.882	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	8	.315	4
6.528	.2570		F	5/16-18	2	Ext.	●	MVE0653X02S080	35.2	1.386	37.2	1.465	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					3	Int.	●	MVS0653X03S080	36.2	1.425	38.2	1.504	89.2	3.512	88	3.465	1.2	.047	8	.315	4
					5	Int.	●	MVS0653X05S080	57.2	2.252	59.2	2.331	110.2	4.339	109	4.291	1.2	.047	8	.315	4
					8	Int.	●	MVS0653X08S080	78.2	3.079	80.2	3.157	131.2	5.165	130	5.118	1.2	.047	8	.315	4
6.6	.2598				2	Ext.	★	MVE0660X02S070	35.2	1.386	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	7	.276	2
					2	Ext.	●	MVE0660X02S080	35.2	1.386	37.2	1.465	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					3	Ext.	★	MVE0660X03S070	44.2	1.740	44.2	1.740	84.2	3.315	83	3.268	1.2	.047	7	.276	2
					3	Ext.	★	MVE0660X03S080	44.2	1.740	46.2	1.819	84.2	3.315	83	3.268	1.2	.047	8	.315	2
					3	Int.	★	MVS0660X03S070	36.2	1.425	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7	.276	4
					3	Int.	●	MVS0660X03S080	36.2	1.425	38.2	1.504	89.2	3.512	88	3.465	1.2	.047	8	.315	4
					5	Int.	★	MVS0660X05S070	57.2	2.252	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7	.276	4
					5	Int.	●	MVS0660X05S080	57.2	2.252	59.2	2.331	110.2	4.339	109	4.291	1.2	.047	8	.315	4
					8	Int.	★	MVS0660X08S070	78.2	3.079	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7	.276	4
					8	Int.	●	MVS0660X08S080	78.2	3.079	80.2	3.157	131.2	5.165	130	5.118	1.2	.047	8	.315	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
6.7	.2638			M8x1.25	2	Ext.	★	MVE0670X02S070	35.2	1.386	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	7	.276	2
					2	Ext.	●	MVE0670X02S080	35.2	1.386	37.2	1.465	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					3	Ext.	★	MVE0670X03S070	44.2	1.740	44.2	1.740	84.2	3.315	83	3.268	1.2	.047	7	.276	2
					3	Ext.	★	MVE0670X03S080	44.2	1.740	46.2	1.819	84.2	3.315	83	3.268	1.2	.047	8	.315	2
					3	Int.	★	MVS0670X03S070	36.2	1.425	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7	.276	4
					3	Int.	●	MVS0670X03S080	36.2	1.425	38.2	1.504	89.2	3.512	88	3.465	1.2	.047	8	.315	4
					5	Int.	★	MVS0670X05S070	57.2	2.252	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7	.276	4
					5	Int.	●	MVS0670X05S080	57.2	2.252	59.2	2.331	110.2	4.339	109	4.291	1.2	.047	8	.315	4
					8	Int.	★	MVS0670X08S070	78.2	3.079	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7	.276	4
					8	Int.	●	MVS0670X08S080	78.2	3.079	80.2	3.157	131.2	5.165	130	5.118	1.2	.047	8	.315	4
6.747	.2656	17/64			2	Ext.	●	MVE0675X02S080	35.2	1.386	37.2	1.465	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					3	Int.	●	MVS0675X03S080	36.2	1.425	38.2	1.504	89.2	3.512	88	3.465	1.2	.047	8	.315	4
					5	Int.	●	MVS0675X05S080	57.2	2.252	59.2	2.331	110.2	4.339	109	4.291	1.2	.047	8	.315	4
					8	Int.	●	MVS0675X08S080	78.2	3.079	80.2	3.157	131.2	5.165	130	5.118	1.2	.047	8	.315	4
6.8	.2677				2	Ext.	★	MVE0680X02S070	35.2	1.386	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	7	.276	2
					2	Ext.	●	MVE0680X02S080	35.2	1.386	37.2	1.465	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					3	Ext.	★	MVE0680X03S070	44.2	1.740	44.2	1.740	84.2	3.315	83	3.268	1.2	.047	7	.276	2
					3	Ext.	★	MVE0680X03S080	44.2	1.740	46.2	1.819	84.2	3.315	83	3.268	1.2	.047	8	.315	2
					3	Int.	★	MVS0680X03S070	36.2	1.425	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7	.276	4
					3	Int.	●	MVS0680X03S080	36.2	1.425	38.2	1.504	89.2	3.512	88	3.465	1.2	.047	8	.315	4
					5	Int.	★	MVS0680X05S070	57.2	2.252	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7	.276	4
					5	Int.	●	MVS0680X05S080	57.2	2.252	59.2	2.331	110.2	4.339	109	4.291	1.2	.047	8	.315	4
					8	Int.	★	MVS0680X08S070	78.2	3.079	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7	.276	4
					8	Int.	●	MVS0680X08S080	78.2	3.079	80.2	3.157	131.2	5.165	130	5.118	1.2	.047	8	.315	4
6.9	.2717		I	5/16-24	2	Ext.	★	MVE0690X02S070	35.3	1.390	35.3	1.390	75.3	2.965	74	2.913	1.3	.051	7	.276	2
					2	Ext.	●	MVE0690X02S080	35.3	1.390	37.3	1.469	75.3	2.965	74	2.913	1.3	.051	8	.315	2
					3	Ext.	★	MVE0690X03S070	44.3	1.744	44.3	1.744	84.3	3.319	83	3.268	1.3	.051	7	.276	2
					3	Ext.	★	MVE0690X03S080	44.3	1.744	46.3	1.823	84.3	3.319	83	3.268	1.3	.051	8	.315	2
					3	Int.	★	MVS0690X03S070	36.3	1.429	36.3	1.429	89.3	3.516	88	3.465	1.3	.051	7	.276	4
					3	Int.	●	MVS0690X03S080	36.3	1.429	38.3	1.508	89.3	3.516	88	3.465	1.3	.051	8	.315	4
					5	Int.	★	MVS0690X05S070	57.3	2.256	57.3	2.256	110.3	4.343	109	4.291	1.3	.051	7	.276	4
					5	Int.	●	MVS0690X05S080	57.3	2.256	59.3	2.335	110.3	4.343	109	4.291	1.3	.051	8	.315	4
					8	Int.	★	MVS0690X08S070	78.3	3.083	78.3	3.083	131.3	5.169	130	5.118	1.3	.051	7	.276	4
					8	Int.	●	MVS0690X08S080	78.3	3.083	80.3	3.161	131.3	5.169	130	5.118	1.3	.051	8	.315	4
7.0	.2756			M8x1.0	2	Ext.	★	MVE0700X02S070	35.3	1.390	35.3	1.390	75.3	2.965	74	2.913	1.3	.051	7	.276	2
					2	Ext.	●	MVE0700X02S080	35.3	1.390	37.3	1.469	75.3	2.965	74	2.913	1.3	.051	8	.315	2
					3	Ext.	★	MVE0700X03S070	44.3	1.744	44.3	1.744	84.3	3.319	83	3.268	1.3	.051	7	.276	2
					3	Ext.	★	MVE0700X03S080	44.3	1.744	46.3	1.823	84.3	3.319	83	3.268	1.3	.051	8	.315	2
					3	Int.	★	MVS0700X03S070	36.3	1.429	36.3	1.429	89.3	3.516	88	3.465	1.3	.051	7	.276	4
					3	Int.	●	MVS0700X03S080	36.3	1.429	38.3	1.508	89.3	3.516	88	3.465	1.3	.051	8	.315	4
					5	Int.	★	MVS0700X05S070	57.3	2.256	57.3	2.256	110.3	4.343	109	4.291	1.3	.051	7	.276	4
					5	Int.	●	MVS0700X05S080	57.3	2.256	59.3	2.335	110.3	4.343	109	4.291	1.3	.051	8	.315	4
					8	Int.	★	MVS0700X08S070	78.3	3.083	78.3	3.083	131.3	5.169	130	5.118	1.3	.051	7	.276	4
					8	Int.	●	MVS0700X08S080	78.3	3.083	80.3	3.161	131.3	5.169	130	5.118	1.3	.051	8	.315	4

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

MVE/MVS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
7.1	.2795				2	Ext.	●	MVE0710X02S080	35.3	1.390	38.3	1.508	80.3	3.161	79	3.110	1.3	.051	8	.315	2
					3	Ext.	★	MVE0710X03S080	46.3	1.823	49.3	1.941	91.3	3.594	90	3.543	1.3	.051	8	.315	2
					3	Int.	●	MVS0710X03S080	38.8	1.528	41.3	1.626	95.3	3.752	94	3.701	1.3	.051	8	.315	4
					5	Int.	●	MVS0710X05S080	61.3	2.413	65.3	2.571	119.3	4.697	118	4.646	1.3	.051	8	.315	4
					8	Int.	●	MVS0710X08S080	84.3	3.319	89.3	3.516	143.3	5.642	142	5.591	1.3	.051	8	.315	4
7.144	.2812	9/32			2	Ext.	●	MVE0714X02S080	35.3	1.390	38.3	1.508	80.3	3.161	79	3.110	1.3	.051	8	.315	2
					3	Int.	●	MVS0714X03S080	38.8	1.528	41.3	1.626	95.3	3.752	94	3.701	1.3	.051	8	.315	4
					5	Int.	●	MVS0714X05S080	61.3	2.413	65.3	2.571	119.3	4.697	118	4.646	1.3	.051	8	.315	4
					8	Int.	●	MVS0714X08S080	84.3	3.319	89.3	3.516	143.3	5.642	142	5.591	1.3	.051	8	.315	4
7.2	.2835				2	Ext.	●	MVE0720X02S080	35.3	1.390	38.3	1.508	80.3	3.161	79	3.110	1.3	.051	8	.315	2
					3	Ext.	★	MVE0720X03S080	46.3	1.823	49.3	1.941	91.3	3.594	90	3.543	1.3	.051	8	.315	2
					3	Int.	●	MVS0720X03S080	38.8	1.528	41.3	1.626	95.3	3.752	94	3.701	1.3	.051	8	.315	4
					5	Int.	●	MVS0720X05S080	61.3	2.413	65.3	2.571	119.3	4.697	118	4.646	1.3	.051	8	.315	4
					8	Int.	●	MVS0720X08S080	84.3	3.319	89.3	3.516	143.3	5.642	142	5.591	1.3	.051	8	.315	4
7.3	.2874				2	Ext.	●	MVE0730X02S080	35.3	1.390	38.3	1.508	80.3	3.161	79	3.110	1.3	.051	8	.315	2
					3	Ext.	★	MVE0730X03S080	46.3	1.823	49.3	1.941	91.3	3.594	90	3.543	1.3	.051	8	.315	2
					3	Int.	●	MVS0730X03S080	38.8	1.528	41.3	1.626	95.3	3.752	94	3.701	1.3	.051	8	.315	4
					5	Int.	●	MVS0730X05S080	61.3	2.413	65.3	2.571	119.3	4.697	118	4.646	1.3	.051	8	.315	4
					8	Int.	●	MVS0730X08S080	84.3	3.319	89.3	3.516	143.3	5.642	142	5.591	1.3	.051	8	.315	4
7.4	.2913				2	Ext.	●	MVE0740X02S080	35.4	1.394	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	8	.315	2
					3	Ext.	★	MVE0740X03S080	46.4	1.827	49.4	1.945	91.4	3.598	90	3.543	1.4	.055	8	.315	2
					3	Int.	●	MVS0740X03S080	38.9	1.531	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8	.315	4
					5	Int.	●	MVS0740X05S080	61.4	2.417	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8	.315	4
					8	Int.	●	MVS0740X08S080	84.4	3.323	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8	.315	4
7.5	.2953				2	Ext.	●	MVE0750X02S080	35.4	1.394	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	8	.315	2
					3	Ext.	★	MVE0750X03S080	46.4	1.827	49.4	1.945	91.4	3.598	90	3.543	1.4	.055	8	.315	2
					3	Int.	●	MVS0750X03S080	38.9	1.531	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8	.315	4
					5	Int.	●	MVS0750X05S080	61.4	2.417	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8	.315	4
					8	Int.	●	MVS0750X08S080	84.4	3.323	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8	.315	4
7.541	.2969	19/64			2	Ext.	●	MVE0754X02S080	38.4	1.512	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	8	.315	2
					3	Int.	●	MVS0754X03S080	41.4	1.630	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8	.315	4
					5	Int.	●	MVS0754X05S080	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8	.315	4
					8	Int.	●	MVS0754X08S080	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8	.315	4
7.6	.2992				2	Ext.	●	MVE0760X02S080	38.4	1.512	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	8	.315	2
					3	Ext.	★	MVE0760X03S080	49.4	1.945	49.4	1.945	91.4	3.598	90	3.543	1.4	.055	8	.315	2
					3	Int.	●	MVS0760X03S080	41.4	1.630	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8	.315	4
					5	Int.	●	MVS0760X05S080	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8	.315	4
					8	Int.	●	MVS0760X08S080	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8	.315	4
7.7	.3031				2	Ext.	●	MVE0770X02S080	38.4	1.512	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	8	.315	2
					3	Ext.	★	MVE0770X03S080	49.4	1.945	49.4	1.945	91.4	3.598	90	3.543	1.4	.055	8	.315	2
					3	Int.	●	MVS0770X03S080	41.4	1.630	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8	.315	4
					5	Int.	●	MVS0770X05S080	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8	.315	4
					8	Int.	●	MVS0770X08S080	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8	.315	4
7.8	.3071				2	Ext.	●	MVE0780X02S080	38.4	1.512	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	8	.315	2
					3	Ext.	★	MVE0780X03S080	49.4	1.945	49.4	1.945	91.4	3.598	90	3.543	1.4	.055	8	.315	2
					3	Int.	●	MVS0780X03S080	41.4	1.630	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8	.315	4
					5	Int.	●	MVS0780X05S080	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8	.315	4
					8	Int.	●	MVS0780X08S080	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8	.315	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
7.9	.3110				2	Ext.	●	MVE0790X02S080	38.4	1.512	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	8	.315	2
					3	Ext.	★	MVE0790X03S080	49.4	1.945	49.4	1.945	91.4	3.598	90	3.543	1.4	.055	8	.315	2
					3	Int.	●	MVS0790X03S080	41.4	1.630	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8	.315	4
					5	Int.	●	MVS0790X05S080	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8	.315	4
					8	Int.	●	MVS0790X08S080	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8	.315	4
7.938	.3125	5/16		3/8-16	2	Ext.	●	MVE0794X02S080	38.4	1.512	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	8	.315	2
					3	Int.	●	MVS0794X03S080	41.4	1.630	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8	.315	4
					5	Int.	●	MVS0794X05S080	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8	.315	4
					8	Int.	●	MVS0794X08S080	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8	.315	4
8.0	.3150				2	Ext.	●	MVE0800X02S080	38.5	1.516	38.5	1.516	80.5	3.169	79	3.110	1.5	.059	8	.315	2
					3	Ext.	★	MVE0800X03S080	49.5	1.949	49.5	1.949	91.5	3.602	90	3.543	1.5	.059	8	.315	2
					3	Int.	●	MVS0800X03S080	41.5	1.634	41.5	1.634	95.5	3.760	94	3.701	1.5	.059	8	.315	4
					5	Int.	●	MVS0800X05S080	65.5	2.579	65.5	2.579	119.5	4.705	118	4.646	1.5	.059	8	.315	4
					8	Int.	●	MVS0800X08S080	89.5	3.524	89.5	3.524	143.5	5.650	142	5.591	1.5	.059	8	.315	4
8.1	.3189				2	Ext.	★	MVE0810X02S090	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	9	.354	2
					2	Ext.	●	MVE0810X02S100	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	10	.394	2
					3	Ext.	★	MVE0810X03S090	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	9	.354	2
					3	Ext.	★	MVE0810X03S100	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	10	.394	2
					3	Int.	★	MVS0810X03S090	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	9	.354	4
					3	Int.	●	MVS0810X03S100	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	10	.394	4
					5	Int.	★	MVS0810X05S090	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	9	.354	4
					5	Int.	●	MVS0810X05S100	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	10	.394	4
					8	Int.	★	MVS0810X08S090	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	9	.354	4
					8	Int.	●	MVS0810X08S100	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	10	.394	4
8.2	.3228				2	Ext.	★	MVE0820X02S090	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	9	.354	2
					2	Ext.	●	MVE0820X02S100	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	10	.394	2
					3	Ext.	★	MVE0820X03S090	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	9	.354	2
					3	Ext.	★	MVE0820X03S100	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	10	.394	2
					3	Int.	★	MVS0820X03S090	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	9	.354	4
					3	Int.	●	MVS0820X03S100	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	10	.394	4
					5	Int.	★	MVS0820X05S090	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	9	.354	4
					5	Int.	●	MVS0820X05S100	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	10	.394	4
					8	Int.	★	MVS0820X08S090	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	9	.354	4
					8	Int.	●	MVS0820X08S100	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	10	.394	4
8.3	.3268				2	Ext.	★	MVE0830X02S090	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	9	.354	2
					2	Ext.	●	MVE0830X02S100	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	10	.394	2
					3	Ext.	★	MVE0830X03S090	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	9	.354	2
					3	Ext.	★	MVE0830X03S100	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	10	.394	2
					3	Int.	★	MVS0830X03S090	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	9	.354	4
					3	Int.	●	MVS0830X03S100	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	10	.394	4
					5	Int.	★	MVS0830X05S090	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	9	.354	4
					5	Int.	●	MVS0830X05S100	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	10	.394	4
					8	Int.	★	MVS0830X08S090	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	9	.354	4
					8	Int.	●	MVS0830X08S100	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	10	.394	4
8.334	.3281	21/64			2	Ext.	●	MVE0833X02S100	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	10	.394	2
					3	Int.	●	MVS0833X03S100	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	10	.394	4
					5	Int.	●	MVS0833X05S100	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	10	.394	4
					8	Int.	●	MVS0833X08S100	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	10	.394	4

DRILLING

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

MVE/MVS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
8.4	.3307				2	Ext.	★	MVE0840X02S090	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	9	.354	2
					2	Ext.	●	MVE0840X02S100	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	10	.394	2
					3	Ext.	★	MVE0840X03S090	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	9	.354	2
					3	Ext.	★	MVE0840X03S100	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	10	.394	2
					3	Int.	★	MVS0840X03S090	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	9	.354	4
					3	Int.	●	MVS0840X03S100	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	10	.394	4
					5	Int.	★	MVS0840X05S090	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	9	.354	4
					5	Int.	●	MVS0840X05S100	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	10	.394	4
					8	Int.	★	MVS0840X08S090	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	9	.354	4
					8	Int.	●	MVS0840X08S100	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	10	.394	4
8.433	.3320		Q	3/8-24	2	Ext.	●	MVE0843X02S100	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	10	.394	2
					3	Int.	●	MVS0843X03S100	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	10	.394	4
					5	Int.	●	MVS0843X05S100	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	10	.394	4
					8	Int.	●	MVS0843X08S100	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	10	.394	4
8.5	.3346			M10x1.5	2	Ext.	★	MVE0850X02S090	38.6	1.520	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	9	.354	2
					2	Ext.	●	MVE0850X02S100	38.6	1.520	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	10	.394	2
					3	Ext.	★	MVE0850X03S090	54.6	2.150	57.6	2.268	99.6	3.921	98	3.858	1.6	.063	9	.354	2
					3	Ext.	★	MVE0850X03S100	54.6	2.150	57.6	2.268	99.6	3.921	98	3.858	1.6	.063	10	.394	2
					3	Int.	★	MVS0850X03S090	44.1	1.736	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9	.354	4
					3	Int.	●	MVS0850X03S100	44.1	1.736	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	10	.394	4
					5	Int.	★	MVS0850X05S090	69.6	2.740	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9	.354	4
					5	Int.	●	MVS0850X05S100	69.6	2.740	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	10	.394	4
					8	Int.	★	MVS0850X08S090	95.6	3.764	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9	.354	4
					8	Int.	●	MVS0850X08S100	95.6	3.764	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	10	.394	4
8.6	.3386				2	Ext.	★	MVE0860X02S090	41.6	1.638	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	9	.354	2
					2	Ext.	●	MVE0860X02S100	41.6	1.638	43.6	1.717	85.6	3.370	84	3.307	1.6	.063	10	.394	2
					3	Ext.	★	MVE0860X03S090	56.6	2.228	56.6	2.228	99.6	3.921	98	3.858	1.6	.063	9	.354	2
					3	Ext.	★	MVE0860X03S100	56.6	2.228	58.6	2.307	99.6	3.921	98	3.858	1.6	.063	10	.394	2
					3	Int.	★	MVS0860X03S090	46.6	1.835	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9	.354	4
					3	Int.	●	MVS0860X03S100	46.6	1.835	48.6	1.913	101.6	4.000	100	3.937	1.6	.063	10	.394	4
					5	Int.	★	MVS0860X05S090	73.6	2.898	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9	.354	4
					5	Int.	●	MVS0860X05S100	73.6	2.898	75.6	2.976	128.6	5.063	127	5.000	1.6	.063	10	.394	4
					8	Int.	★	MVS0860X08S090	100.6	3.961	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9	.354	4
					8	Int.	●	MVS0860X08S100	100.6	3.961	102.6	4.039	155.6	6.126	154	6.063	1.6	.063	10	.394	4
8.7	.3425			M10x1.25	2	Ext.	★	MVE0870X02S090	41.6	1.638	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	9	.354	2
					2	Ext.	●	MVE0870X02S100	41.6	1.638	43.6	1.717	85.6	3.370	84	3.307	1.6	.063	10	.394	2
					3	Ext.	★	MVE0870X03S090	56.6	2.228	56.6	2.228	99.6	3.921	98	3.858	1.6	.063	9	.354	2
					3	Ext.	★	MVE0870X03S100	56.6	2.228	58.6	2.307	99.6	3.921	98	3.858	1.6	.063	10	.394	2
					3	Int.	★	MVS0870X03S090	46.6	1.835	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9	.354	4
					3	Int.	●	MVS0870X03S100	46.6	1.835	48.6	1.913	101.6	4.000	100	3.937	1.6	.063	10	.394	4
					5	Int.	★	MVS0870X05S090	73.6	2.898	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9	.354	4
					5	Int.	●	MVS0870X05S100	73.6	2.898	75.6	2.976	128.6	5.063	127	5.000	1.6	.063	10	.394	4
					8	Int.	★	MVS0870X08S090	100.6	3.961	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9	.354	4
					8	Int.	●	MVS0870X08S100	100.6	3.961	102.6	4.039	155.6	6.126	154	6.063	1.6	.063	10	.394	4
8.731	.3438	11/32			2	Ext.	●	MVE0873X02S100	41.6	1.638	43.6	1.717	85.6	3.370	84	3.307	1.6	.063	10	.394	2
					3	Int.	●	MVS0873X03S100	46.6	1.835	48.6	1.913	101.6	4.000	100	3.937	1.6	.063	10	.394	4
					5	Int.	●	MVS0873X05S100	73.6	2.898	75.6	2.976	128.6	5.063	127	5.000	1.6	.063	10	.394	4
					8	Int.	●	MVS0873X08S100	100.6	3.961	102.6	4.039	155.6	6.126	154	6.063	1.6	.063	10	.394	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
8.8	.3465				2	Ext.	★	MVE0880X02S090	41.6	1.638	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	9	.354	2
					2	Ext.	●	MVE0880X02S100	41.6	1.638	43.6	1.717	85.6	3.370	84	3.307	1.6	.063	10	.394	2
					3	Ext.	★	MVE0880X03S090	56.6	2.228	56.6	2.228	99.6	3.921	98	3.858	1.6	.063	9	.354	2
					3	Ext.	★	MVE0880X03S100	56.6	2.228	58.6	2.307	99.6	3.921	98	3.858	1.6	.063	10	.394	2
					3	Int.	★	MVS0880X03S090	46.6	1.835	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9	.354	4
					3	Int.	●	MVS0880X03S100	46.6	1.835	48.6	1.913	101.6	4.000	100	3.937	1.6	.063	10	.394	4
					5	Int.	★	MVS0880X05S090	73.6	2.898	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9	.354	4
					5	Int.	●	MVS0880X05S100	73.6	2.898	75.6	2.976	128.6	5.063	127	5.000	1.6	.063	10	.394	4
					8	Int.	★	MVS0880X08S090	100.6	3.961	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9	.354	4
					8	Int.	●	MVS0880X08S100	100.6	3.961	102.6	4.039	155.6	6.126	154	6.063	1.6	.063	10	.394	4
8.9	.3504				2	Ext.	★	MVE0890X02S090	41.6	1.638	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	9	.354	2
					2	Ext.	●	MVE0890X02S100	41.6	1.638	43.6	1.717	85.6	3.370	84	3.307	1.6	.063	10	.394	2
					3	Ext.	★	MVE0890X03S090	56.6	2.228	56.6	2.228	99.6	3.921	98	3.858	1.6	.063	9	.354	2
					3	Ext.	★	MVE0890X03S100	56.6	2.228	58.6	2.307	99.6	3.921	98	3.858	1.6	.063	10	.394	2
					3	Int.	★	MVS0890X03S090	46.6	1.835	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9	.354	4
					3	Int.	●	MVS0890X03S100	46.6	1.835	48.6	1.913	101.6	4.000	100	3.937	1.6	.063	10	.394	4
					5	Int.	★	MVS0890X05S090	73.6	2.898	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9	.354	4
					5	Int.	●	MVS0890X05S100	73.6	2.898	75.6	2.976	128.6	5.063	127	5.000	1.6	.063	10	.394	4
					8	Int.	★	MVS0890X08S090	100.6	3.961	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9	.354	4
					8	Int.	●	MVS0890X08S100	100.6	3.961	102.6	4.039	155.6	6.126	154	6.063	1.6	.063	10	.394	4
9.0	.3543				2	Ext.	★	MVE0900X02S090	41.6	1.638	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	9	.354	2
					2	Ext.	●	MVE0900X02S100	41.6	1.638	43.6	1.717	85.6	3.370	84	3.307	1.6	.063	10	.394	2
					3	Ext.	★	MVE0900X03S090	56.6	2.228	56.6	2.228	99.6	3.921	98	3.858	1.6	.063	9	.354	2
					3	Ext.	★	MVE0900X03S100	56.6	2.228	58.6	2.307	99.6	3.921	98	3.858	1.6	.063	10	.394	2
					3	Int.	★	MVS0900X03S090	46.6	1.835	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9	.354	4
					3	Int.	●	MVS0900X03S100	46.6	1.835	48.6	1.913	101.6	4.000	100	3.937	1.6	.063	10	.394	4
					5	Int.	★	MVS0900X05S090	73.6	2.898	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9	.354	4
					5	Int.	●	MVS0900X05S100	73.6	2.898	75.6	2.976	128.6	5.063	127	5.000	1.6	.063	10	.394	4
					8	Int.	★	MVS0900X08S090	100.6	3.961	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9	.354	4
					8	Int.	●	MVS0900X08S100	100.6	3.961	102.6	4.039	155.6	6.126	154	6.063	1.6	.063	10	.394	4
9.1	.3583				2	Ext.	●	MVE0910X02S100	41.7	1.642	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					3	Ext.	★	MVE0910X03S100	59.7	2.350	62.7	2.469	106.7	4.201	105	4.134	1.7	.067	10	.394	2
					3	Int.	●	MVS0910X03S100	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	4
					5	Int.	●	MVS0910X05S100	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	4
					8	Int.	●	MVS0910X08S100	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	4
9.128	.3594	23/64			2	Ext.	●	MVE0913X02S100	41.7	1.642	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					3	Int.	●	MVS0913X03S100	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	4
					5	Int.	●	MVS0913X05S100	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	4
					8	Int.	●	MVS0913X08S100	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	4
9.2	.3622				2	Ext.	●	MVE0920X02S100	41.7	1.642	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					3	Ext.	★	MVE0920X03S100	59.7	2.350	62.7	2.469	106.7	4.201	105	4.134	1.7	.067	10	.394	2
					3	Int.	●	MVS0920X03S100	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	4
					5	Int.	●	MVS0920X05S100	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	4
					8	Int.	●	MVS0920X08S100	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	4

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

MVE/MVS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
9.3	.3661				2	Ext.	●	MVE0930X02S100	41.7	1.642	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					3	Ext.	★	MVE0930X03S100	59.7	2.350	62.7	2.469	106.7	4.201	105	4.134	1.7	.067	10	.394	2
					3	Int.	●	MVS0930X03S100	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	4
					5	Int.	●	MVS0930X05S100	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	4
					8	Int.	●	MVS0930X08S100	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	4
9.347	.3680		U	7/16-14	2	Ext.	●	MVE0935X02S100	41.7	1.642	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					3	Int.	●	MVS0935X03S100	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	4
					5	Int.	●	MVS0935X05S100	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	4
					8	Int.	●	MVS0935X08S100	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	4
9.4	.3701				2	Ext.	●	MVE0940X02S100	41.7	1.642	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					3	Ext.	★	MVE0940X03S100	59.7	2.350	62.7	2.469	106.7	4.201	105	4.134	1.7	.067	10	.394	2
					3	Int.	●	MVS0940X03S100	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	4
					5	Int.	●	MVS0940X05S100	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	4
					8	Int.	●	MVS0940X08S100	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	4
9.5	.3740				2	Ext.	●	MVE0950X02S100	41.7	1.642	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					3	Ext.	★	MVE0950X03S100	59.7	2.350	62.7	2.469	106.7	4.201	105	4.134	1.7	.067	10	.394	2
					3	Int.	●	MVS0950X03S100	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	4
					5	Int.	●	MVS0950X05S100	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	4
					8	Int.	●	MVS0950X08S100	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	4
9.525	.3750	3/8			2	Ext.	●	MVE0953X02S100	44.7	1.760	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					3	Int.	●	MVS0953X03S100	51.7	2.035	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	4
					5	Int.	●	MVS0953X05S100	81.7	3.217	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	4
					8	Int.	●	MVS0953X08S100	111.7	4.398	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	4
9.6	.3780				2	Ext.	●	MVE0960X02S100	44.8	1.764	44.8	1.764	90.8	3.575	89	3.504	1.8	.071	10	.394	2
					3	Ext.	★	MVE0960X03S100	61.8	2.433	61.8	2.433	106.8	4.205	105	4.134	1.8	.071	10	.394	2
					3	Int.	●	MVS0960X03S100	51.8	2.039	51.8	2.039	107.8	4.244	106	4.173	1.8	.071	10	.394	4
					5	Int.	●	MVS0960X05S100	81.8	3.220	81.8	3.220	137.8	5.425	136	5.354	1.8	.071	10	.394	4
					8	Int.	●	MVS0960X08S100	111.8	4.402	111.8	4.402	167.8	6.606	166	6.535	1.8	.071	10	.394	4
9.7	.3819		Tube Sheet		2	Ext.	●	MVE0970X02S100	44.8	1.764	44.8	1.764	90.8	3.575	89	3.504	1.8	.071	10	.394	2
					3	Ext.	★	MVE0970X03S100	61.8	2.433	61.8	2.433	106.8	4.205	105	4.134	1.8	.071	10	.394	2
					3	Int.	●	MVS0970X03S100	51.8	2.039	51.8	2.039	107.8	4.244	106	4.173	1.8	.071	10	.394	4
					5	Int.	●	MVS0970X05S100	81.8	3.220	81.8	3.220	137.8	5.425	136	5.354	1.8	.071	10	.394	4
					8	Int.	●	MVS0970X08S100	111.8	4.402	111.8	4.402	167.8	6.606	166	6.535	1.8	.071	10	.394	4
9.8	.3858				2	Ext.	●	MVE0980X02S100	44.8	1.764	44.8	1.764	90.8	3.575	89	3.504	1.8	.071	10	.394	2
					3	Ext.	★	MVE0980X03S100	61.8	2.433	61.8	2.433	106.8	4.205	105	4.134	1.8	.071	10	.394	2
					3	Int.	●	MVS0980X03S100	51.8	2.039	51.8	2.039	107.8	4.244	106	4.173	1.8	.071	10	.394	4
					5	Int.	●	MVS0980X05S100	81.8	3.220	81.8	3.220	137.8	5.425	136	5.354	1.8	.071	10	.394	4
					8	Int.	●	MVS0980X08S100	111.8	4.402	111.8	4.402	167.8	6.606	166	6.535	1.8	.071	10	.394	4
9.9	.3898				2	Ext.	●	MVE0990X02S100	44.8	1.764	44.8	1.764	90.8	3.575	89	3.504	1.8	.071	10	.394	2
					3	Ext.	★	MVE0990X03S100	61.8	2.433	61.8	2.433	106.8	4.205	105	4.134	1.8	.071	10	.394	2
					3	Int.	●	MVS0990X03S100	51.8	2.039	51.8	2.039	107.8	4.244	106	4.173	1.8	.071	10	.394	4
					5	Int.	●	MVS0990X05S100	81.8	3.220	81.8	3.220	137.8	5.425	136	5.354	1.8	.071	10	.394	4
					8	Int.	●	MVS0990X08S100	111.8	4.402	111.8	4.402	167.8	6.606	166	6.535	1.8	.071	10	.394	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
9.922	.3906	25/64		7/16-20	2	Ext.	●	MVE0992X02S100	44.8	1.764	44.9	1.768	90.8	3.575	89	3.504	1.8	.071	10	.394	2
					3	Int.	●	MVS0992X03S100	51.8	2.039	51.9	2.043	107.8	4.244	106	4.173	1.8	.071	10	.394	4
					5	Int.	●	MVS0992X05S100	81.8	3.220	81.9	3.224	137.8	5.425	136	5.354	1.8	.071	10	.394	4
					8	Int.	●	MVS0992X08S100	111.8	4.402	111.9	4.406	167.8	6.606	166	6.535	1.8	.071	10	.394	4
10.0	.3937				2	Ext.	●	MVE1000X02S100	44.8	1.764	44.8	1.764	90.8	3.575	89	3.504	1.8	.071	10	.394	2
					3	Ext.	★	MVE1000X03S100	61.8	2.433	61.8	2.433	106.8	4.205	105	4.134	1.8	.071	10	.394	2
					3	Int.	●	MVS1000X03S100	51.8	2.039	51.8	2.039	107.8	4.244	106	4.173	1.8	.071	10	.394	4
					5	Int.	●	MVS1000X05S100	81.8	3.220	81.8	3.220	137.8	5.425	136	5.354	1.8	.071	10	.394	4
					8	Int.	●	MVS1000X08S100	111.8	4.402	111.8	4.402	167.8	6.606	166	6.535	1.8	.071	10	.394	4
10.1	.3976				2	Ext.	★	MVE1010X02S110	44.8	1.764	47.8	1.882	96.8	3.811	95	3.740	1.8	.071	11	.433	2
					2	Ext.	●	MVE1010X02S120	44.8	1.764	47.8	1.882	96.8	3.811	95	3.740	1.8	.071	12	.472	2
					3	Ext.	★	MVE1010X03S110	67.8	2.669	70.8	2.787	115.8	4.559	114	4.488	1.8	.071	11	.433	2
					3	Ext.	★	MVE1010X03S120	67.8	2.669	70.8	2.787	115.8	4.559	114	4.488	1.8	.071	12	.472	2
					3	Int.	★	MVS1010X03S110	54.3	2.138	56.8	2.236	117.8	4.638	116	4.567	1.8	.071	11	.433	4
					3	Int.	●	MVS1010X03S120	54.3	2.138	56.8	2.236	117.8	4.638	116	4.567	1.8	.071	12	.472	4
					5	Int.	★	MVS1010X05S110	85.8	3.378	89.8	3.535	150.8	5.937	149	5.866	1.8	.071	11	.433	4
					5	Int.	●	MVS1010X05S120	85.8	3.378	89.8	3.535	150.8	5.937	149	5.866	1.8	.071	12	.472	4
					8	Int.	★	MVS1010X08S110	117.8	4.638	122.8	4.835	183.8	7.236	182	7.165	1.8	.071	11	.433	4
					8	Int.	●	MVS1010X08S120	117.8	4.638	122.8	4.835	183.8	7.236	182	7.165	1.8	.071	12	.472	4
10.2	.4016			M12x1.75	2	Ext.	★	MVE1020X02S110	44.9	1.768	47.9	1.886	96.9	3.815	95	3.740	1.9	.075	11	.433	2
					2	Ext.	●	MVE1020X02S120	44.9	1.768	47.9	1.886	96.9	3.815	95	3.740	1.9	.075	12	.472	2
					3	Ext.	★	MVE1020X03S110	67.9	2.673	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	11	.433	2
					3	Ext.	★	MVE1020X03S120	67.9	2.673	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	12	.472	2
					3	Int.	★	MVS1020X03S110	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	11	.433	4
					3	Int.	●	MVS1020X03S120	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	12	.472	4
					5	Int.	★	MVS1020X05S110	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	11	.433	4
					5	Int.	●	MVS1020X05S120	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	12	.472	4
					8	Int.	★	MVS1020X08S110	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	11	.433	4
					8	Int.	●	MVS1020X08S120	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	12	.472	4
10.3	.4055				2	Ext.	★	MVE1030X02S110	44.9	1.768	47.9	1.886	96.9	3.815	95	3.740	1.9	.075	11	.433	2
					2	Ext.	●	MVE1030X02S120	44.9	1.768	47.9	1.886	96.9	3.815	95	3.740	1.9	.075	12	.472	2
					3	Ext.	★	MVE1030X03S110	67.9	2.673	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	11	.433	2
					3	Ext.	★	MVE1030X03S120	67.9	2.673	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	12	.472	2
					3	Int.	★	MVS1030X03S110	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	11	.433	4
					3	Int.	●	MVS1030X03S120	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	12	.472	4
					5	Int.	★	MVS1030X05S110	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	11	.433	4
					5	Int.	●	MVS1030X05S120	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	12	.472	4
					8	Int.	★	MVS1030X08S110	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	11	.433	4
					8	Int.	●	MVS1030X08S120	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	12	.472	4
10.319	.4062	13/32			2	Ext.	●	MVE1032X02S120	44.9	1.768	46.7	1.839	96.9	3.815	95	3.740	1.9	.075	12	.472	2
					3	Int.	●	MVS1032X03S120	54.4	2.142	56.2	2.213	117.9	4.642	116	4.567	1.9	.075	12	.472	4
					5	Int.	●	MVS1032X05S120	85.9	3.382	87.7	3.453	150.9	5.941	149	5.866	1.9	.075	12	.472	4
					8	Int.	●	MVS1032X08S120	117.9	4.642	119.7	4.713	183.9	7.240	182	7.165	1.9	.075	12	.472	4

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

MVE/MVS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
10.4	.4094				2	Ext.	★	MVE1040X02S110	44.9	1.768	47.9	1.886	96.9	3.815	95	3.740	1.9	.075	11	.433	2
					2	Ext.	●	MVE1040X02S120	44.9	1.768	47.9	1.886	96.9	3.815	95	3.740	1.9	.075	12	.472	2
					3	Ext.	★	MVE1040X03S110	67.9	2.673	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	11	.433	2
					3	Ext.	★	MVE1040X03S120	67.9	2.673	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	12	.472	2
					3	Int.	★	MVS1040X03S110	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	11	.433	4
					3	Int.	●	MVS1040X03S120	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	12	.472	4
					5	Int.	★	MVS1040X05S110	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	11	.433	4
					5	Int.	●	MVS1040X05S120	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	12	.472	4
					8	Int.	★	MVS1040X08S110	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	11	.433	4
					8	Int.	●	MVS1040X08S120	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	12	.472	4
10.5	.4134				2	Ext.	★	MVE1050X02S110	44.9	1.768	47.9	1.886	96.9	3.815	95	3.740	1.9	.075	11	.433	2
					2	Ext.	●	MVE1050X02S120	44.9	1.768	47.9	1.886	96.9	3.815	95	3.740	1.9	.075	12	.472	2
					3	Ext.	★	MVE1050X03S110	67.9	2.673	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	11	.433	2
					3	Ext.	★	MVE1050X03S120	67.9	2.673	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	12	.472	2
					3	Int.	★	MVS1050X03S110	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	11	.433	4
					3	Int.	●	MVS1050X03S120	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	12	.472	4
					5	Int.	★	MVS1050X05S110	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	11	.433	4
					5	Int.	●	MVS1050X05S120	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	12	.472	4
					8	Int.	★	MVS1050X08S110	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	11	.433	4
					8	Int.	●	MVS1050X08S120	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	12	.472	4
10.6	.4173				2	Ext.	★	MVE1060X02S110	48.9	1.925	48.9	1.925	96.9	3.815	95	3.740	1.9	.075	11	.433	2
					2	Ext.	●	MVE1060X02S120	48.9	1.925	49.9	1.965	96.9	3.815	95	3.740	1.9	.075	12	.472	2
					3	Ext.	★	MVE1060X03S110	69.9	2.752	69.9	2.752	115.9	4.563	114	4.488	1.9	.075	11	.433	2
					3	Ext.	★	MVE1060X03S120	69.9	2.752	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	12	.472	2
					3	Int.	★	MVS1060X03S110	56.9	2.240	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	11	.433	4
					3	Int.	●	MVS1060X03S120	56.9	2.240	57.9	2.280	117.9	4.642	116	4.567	1.9	.075	12	.472	4
					5	Int.	★	MVS1060X05S110	89.9	3.539	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	11	.433	4
					5	Int.	●	MVS1060X05S120	89.9	3.539	90.9	3.579	150.9	5.941	149	5.866	1.9	.075	12	.472	4
					8	Int.	★	MVS1060X08S110	122.9	4.839	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	11	.433	4
					8	Int.	●	MVS1060X08S120	122.9	4.839	123.9	4.878	183.9	7.240	182	7.165	1.9	.075	12	.472	4
10.7	.4213				2	Ext.	★	MVE1070X02S110	49.0	1.929	49.0	1.929	97.0	3.819	95	3.740	2.0	.079	11	.433	2
					2	Ext.	●	MVE1070X02S120	49.0	1.929	50.0	1.969	97.0	3.819	95	3.740	2.0	.079	12	.472	2
					3	Ext.	★	MVE1070X03S110	70.0	2.756	70.0	2.756	116.0	4.567	114	4.488	2.0	.079	11	.433	2
					3	Ext.	★	MVE1070X03S120	70.0	2.756	71.0	2.795	116.0	4.567	114	4.488	2.0	.079	12	.472	2
					3	Int.	★	MVS1070X03S110	57.0	2.244	57.0	2.244	118.0	4.646	116	4.567	2.0	.079	11	.433	4
					3	Int.	●	MVS1070X03S120	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472	4
					5	Int.	★	MVS1070X05S110	90.0	3.543	90.0	3.543	151.0	5.945	149	5.866	2.0	.079	11	.433	4
					5	Int.	●	MVS1070X05S120	90.0	3.543	91.0	3.583	151.0	5.945	149	5.866	2.0	.079	12	.472	4
					8	Int.	★	MVS1070X08S110	123.0	4.843	123.0	4.843	184.0	7.244	182	7.165	2.0	.079	11	.433	4
					8	Int.	●	MVS1070X08S120	123.0	4.843	124.0	4.882	184.0	7.244	182	7.165	2.0	.079	12	.472	4
10.716	.4219	27/64		1/2-13	2	Ext.	●	MVE1072X02S120	49.0	1.929	50.4	1.984	97.0	3.819	95	3.740	2.0	.079	12	.472	2
					3	Int.	●	MVS1072X03S120	57.0	2.244	58.4	2.299	118.0	4.646	116	4.567	2.0	.079	12	.472	4
					5	Int.	●	MVS1072X05S120	90.0	3.543	91.4	3.598	151.0	5.945	149	5.866	2.0	.079	12	.472	4
					8	Int.	●	MVS1072X08S120	123.0	4.843	124.4	4.898	184.0	7.244	182	7.165	2.0	.079	12	.472	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
10.8	.4252			M12x1.25	2	Ext.	★	MVE1080X02S110	49.0	1.929	49.0	1.929	97.0	3.819	95	3.740	2.0	.079	11	.433	2
					2	Ext.	●	MVE1080X02S120	49.0	1.929	50.0	1.969	97.0	3.819	95	3.740	2.0	.079	12	.472	2
					3	Ext.	★	MVE1080X03S110	70.0	2.756	70.0	2.756	116.0	4.567	114	4.488	2.0	.079	11	.433	2
					3	Ext.	★	MVE1080X03S120	70.0	2.756	71.0	2.795	116.0	4.567	114	4.488	2.0	.079	12	.472	2
					3	Int.	★	MVS1080X03S110	57.0	2.244	57.0	2.244	118.0	4.646	116	4.567	2.0	.079	11	.433	4
					3	Int.	●	MVS1080X03S120	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472	4
					5	Int.	★	MVS1080X05S110	90.0	3.543	90.0	3.543	151.0	5.945	149	5.866	2.0	.079	11	.433	4
					5	Int.	●	MVS1080X05S120	90.0	3.543	91.0	3.583	151.0	5.945	149	5.866	2.0	.079	12	.472	4
					8	Int.	★	MVS1080X08S110	123.0	4.843	123.0	4.843	184.0	7.244	182	7.165	2.0	.079	11	.433	4
					8	Int.	●	MVS1080X08S120	123.0	4.843	124.0	4.882	184.0	7.244	182	7.165	2.0	.079	12	.472	4
10.9	.4291				2	Ext.	★	MVE1090X02S110	49.0	1.929	49.0	1.929	97.0	3.819	95	3.740	2.0	.079	11	.433	2
					2	Ext.	●	MVE1090X02S120	49.0	1.929	50.0	1.969	97.0	3.819	95	3.740	2.0	.079	12	.472	2
					3	Ext.	★	MVE1090X03S110	70.0	2.756	70.0	2.756	116.0	4.567	114	4.488	2.0	.079	11	.433	2
					3	Ext.	★	MVE1090X03S120	70.0	2.756	71.0	2.795	116.0	4.567	114	4.488	2.0	.079	12	.472	2
					3	Int.	★	MVS1090X03S110	57.0	2.244	57.0	2.244	118.0	4.646	116	4.567	2.0	.079	11	.433	4
					3	Int.	●	MVS1090X03S120	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472	4
					5	Int.	★	MVS1090X05S110	90.0	3.543	90.0	3.543	151.0	5.945	149	5.866	2.0	.079	11	.433	4
					5	Int.	●	MVS1090X05S120	90.0	3.543	91.0	3.583	151.0	5.945	149	5.866	2.0	.079	12	.472	4
					8	Int.	★	MVS1090X08S110	123.0	4.843	123.0	4.843	184.0	7.244	182	7.165	2.0	.079	11	.433	4
					8	Int.	●	MVS1090X08S120	123.0	4.843	124.0	4.882	184.0	7.244	182	7.165	2.0	.079	12	.472	4
11.0	.4331				2	Ext.	★	MVE1100X02S110	49.0	1.929	49.0	1.929	97.0	3.819	95	3.740	2.0	.079	11	.433	2
					2	Ext.	●	MVE1100X02S120	49.0	1.929	50.0	1.969	97.0	3.819	95	3.740	2.0	.079	12	.472	2
					3	Ext.	★	MVE1100X03S110	70.0	2.756	70.0	2.756	116.0	4.567	114	4.488	2.0	.079	11	.433	2
					3	Ext.	★	MVE1100X03S120	70.0	2.756	71.0	2.795	116.0	4.567	114	4.488	2.0	.079	12	.472	2
					3	Int.	★	MVS1100X03S110	57.0	2.244	57.0	2.244	118.0	4.646	116	4.567	2.0	.079	11	.433	4
					3	Int.	●	MVS1100X03S120	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472	4
					5	Int.	★	MVS1100X05S110	90.0	3.543	90.0	3.543	151.0	5.945	149	5.866	2.0	.079	11	.433	4
					5	Int.	●	MVS1100X05S120	90.0	3.543	91.0	3.583	151.0	5.945	149	5.866	2.0	.079	12	.472	4
					8	Int.	★	MVS1100X08S110	123.0	4.843	123.0	4.843	184.0	7.244	182	7.165	2.0	.079	11	.433	4
					8	Int.	●	MVS1100X08S120	123.0	4.843	124.0	4.882	184.0	7.244	182	7.165	2.0	.079	12	.472	4
11.1	.4370				2	Ext.	●	MVE1110X02S120	49.0	1.929	52.0	2.047	97.0	3.819	95	3.740	2.0	.079	12	.472	2
					3	Ext.	★	MVE1110X03S120	73.0	2.874	76.0	2.992	123.0	4.843	121	4.764	2.0	.079	12	.472	2
					3	Int.	●	MVS1110X03S120	59.5	2.343	62.0	2.441	124.0	4.882	122	4.803	2.0	.079	12	.472	4
					5	Int.	●	MVS1110X05S120	94.0	3.701	98.0	3.858	160.0	6.299	158	6.220	2.0	.079	12	.472	4
					8	Int.	●	MVS1110X08S120	129.0	5.079	134.0	5.276	196.0	7.717	194	7.638	2.0	.079	12	.472	4
11.113	.4375	7/16			2	Ext.	●	MVE1111X02S120	49.0	1.929	52.0	2.047	97.0	3.819	95	3.740	2.0	.079	12	.472	2
					3	Int.	●	MVS1111X03S120	59.5	2.343	62.0	2.441	124.0	4.882	122	4.803	2.0	.079	12	.472	4
					5	Int.	●	MVS1111X05S120	94.0	3.701	98.0	3.858	160.0	6.299	158	6.220	2.0	.079	12	.472	4
					8	Int.	●	MVS1111X08S120	129.0	5.079	134.0	5.276	196.0	7.717	194	7.638	2.0	.079	12	.472	4
11.2	.4409				2	Ext.	●	MVE1120X02S120	49.0	1.929	52.0	2.047	97.0	3.819	95	3.740	2.0	.079	12	.472	2
					3	Ext.	★	MVE1120X03S120	73.0	2.874	76.0	2.992	123.0	4.843	121	4.764	2.0	.079	12	.472	2
					3	Int.	●	MVS1120X03S120	59.5	2.343	62.0	2.441	124.0	4.882	122	4.803	2.0	.079	12	.472	4
					5	Int.	●	MVS1120X05S120	94.0	3.701	98.0	3.858	160.0	6.299	158	6.220	2.0	.079	12	.472	4
					8	Int.	●	MVS1120X08S120	129.0	5.079	134.0	5.276	196.0	7.717	194	7.638	2.0	.079	12	.472	4

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

MVE/MVS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
11.3	.4449				2	Ext.	●	MVE1130X02S120	49.1	1.933	52.1	2.051	97.1	3.823	95	3.740	2.1	.083	12	.472	2
					3	Ext.	★	MVE1130X03S120	73.1	2.878	76.1	2.996	123.1	4.846	121	4.764	2.1	.083	12	.472	2
					3	Int.	●	MVS1130X03S120	59.6	2.346	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12	.472	4
					5	Int.	●	MVS1130X05S120	94.1	3.705	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12	.472	4
					8	Int.	●	MVS1130X08S120	129.1	5.083	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12	.472	4
11.4	.4488				2	Ext.	●	MVE1140X02S120	49.1	1.933	52.1	2.051	97.1	3.823	95	3.740	2.1	.083	12	.472	2
					3	Ext.	★	MVE1140X03S120	73.1	2.878	76.1	2.996	123.1	4.846	121	4.764	2.1	.083	12	.472	2
					3	Int.	●	MVS1140X03S120	59.6	2.346	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12	.472	4
					5	Int.	●	MVS1140X05S120	94.1	3.705	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12	.472	4
					8	Int.	●	MVS1140X08S120	129.1	5.083	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12	.472	4
11.5	.4528				2	Ext.	●	MVE1150X02S120	49.1	1.933	52.1	2.051	97.1	3.823	95	3.740	2.1	.083	12	.472	2
					3	Ext.	★	MVE1150X03S120	73.1	2.878	76.1	2.996	123.1	4.846	121	4.764	2.1	.083	12	.472	2
					3	Int.	●	MVS1150X03S120	59.6	2.346	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12	.472	4
					5	Int.	●	MVS1150X05S120	94.1	3.705	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12	.472	4
					8	Int.	●	MVS1150X08S120	129.1	5.083	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12	.472	4
11.509	.4531	29/64		1/2-20	2	Ext.	●	MVE1151X02S120	49.1	1.933	49.1	1.933	97.1	3.823	95	3.740	2.1	.083	12	.472	2
					3	Int.	●	MVS1151X03S120	62.1	2.445	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12	.472	4
					5	Int.	●	MVS1151X05S120	98.1	3.862	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12	.472	4
					8	Int.	●	MVS1151X08S120	134.1	5.280	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12	.472	4
11.6	.4567				2	Ext.	●	MVE1160X02S120	49.1	1.933	49.1	1.933	97.1	3.823	95	3.740	2.1	.083	12	.472	2
					3	Ext.	★	MVE1160X03S120	75.1	2.957	75.1	2.957	123.1	4.846	121	4.764	2.1	.083	12	.472	2
					3	Int.	●	MVS1160X03S120	62.1	2.445	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12	.472	4
					5	Int.	●	MVS1160X05S120	98.1	3.862	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12	.472	4
					8	Int.	●	MVS1160X08S120	134.1	5.280	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12	.472	4
11.7	.4606				2	Ext.	●	MVE1170X02S120	49.1	1.933	49.1	1.933	97.1	3.823	95	3.740	2.1	.083	12	.472	2
					3	Ext.	★	MVE1170X03S120	75.1	2.957	75.1	2.957	123.1	4.846	121	4.764	2.1	.083	12	.472	2
					3	Int.	●	MVS1170X03S120	62.1	2.445	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12	.472	4
					5	Int.	●	MVS1170X05S120	98.1	3.862	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12	.472	4
					8	Int.	●	MVS1170X08S120	134.1	5.280	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12	.472	4
11.8	.4646				2	Ext.	●	MVE1180X02S120	49.2	1.937	49.2	1.937	97.2	3.827	95	3.740	2.2	.087	12	.472	2
					3	Ext.	★	MVE1180X03S120	75.2	2.961	75.2	2.961	123.2	4.850	121	4.764	2.2	.087	12	.472	2
					3	Int.	●	MVS1180X03S120	62.2	2.449	62.2	2.449	124.2	4.890	122	4.803	2.2	.087	12	.472	4
					5	Int.	●	MVS1180X05S120	98.2	3.866	98.2	3.866	160.2	6.307	158	6.220	2.2	.087	12	.472	4
					8	Int.	●	MVS1180X08S120	134.2	5.283	134.2	5.283	196.2	7.724	194	7.638	2.2	.087	12	.472	4
11.9	.4685	15/32			2	Ext.	●	MVE1190X02S120	49.2	1.937	49.2	1.937	97.2	3.827	95	3.740	2.2	.087	12	.472	2
					3	Ext.	★	MVE1190X03S120	75.2	2.961	75.2	2.961	123.2	4.850	121	4.764	2.2	.087	12	.472	2
					3	Int.	●	MVS1190X03S120	62.2	2.449	62.2	2.449	124.2	4.890	122	4.803	2.2	.087	12	.472	4
					5	Int.	●	MVS1190X05S120	98.2	3.866	98.2	3.866	160.2	6.307	158	6.220	2.2	.087	12	.472	4
					8	Int.	●	MVS1190X08S120	134.2	5.283	134.2	5.283	196.2	7.724	194	7.638	2.2	.087	12	.472	4
12.0	.4724			M14x2.0	2	Ext.	●	MVE1200X02S120	49.2	1.937	49.2	1.937	97.2	3.827	95	3.740	2.2	.087	12	.472	2
					3	Ext.	★	MVE1200X03S120	75.2	2.961	75.2	2.961	123.2	4.850	121	4.764	2.2	.087	12	.472	2
					3	Int.	●	MVS1200X03S120	62.2	2.449	62.2	2.449	124.2	4.890	122	4.803	2.2	.087	12	.472	4
					5	Int.	●	MVS1200X05S120	98.2	3.866	98.2	3.866	160.2	6.307	158	6.220	2.2	.087	12	.472	4
					8	Int.	●	MVS1200X08S120	134.2	5.283	134.2	5.283	196.2	7.724	194	7.638	2.2	.087	12	.472	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

□ : Non stock, produced to order only.

NEW

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
12.1	.4764				2	Ext.	★	MVE1210X02S130	53.2	2.094	56.2	2.213	104.2	4.102	102	4.016	2.2	.087	13	.512	2
					2	Ext.	●	MVE1210X02S140	53.2	2.094	56.2	2.213	104.2	4.102	102	4.016	2.2	.087	14	.551	2
					3	Ext.	★	MVE1210X03S130	78.2	3.079	81.2	3.197	139.2	5.480	137	5.394	2.2	.087	13	.512	2
					3	Ext.	□	MVE1210X03S140	78.2	3.079	81.2	3.197	139.2	5.480	137	5.394	2.2	.087	14	.551	2
					3	Int.	★	MVS1210X03S130	64.7	2.547	67.2	2.646	130.2	5.126	128	5.039	2.2	.087	13	.512	4
					3	Int.	●	MVS1210X03S140	64.7	2.547	67.2	2.646	130.2	5.126	128	5.039	2.2	.087	14	.551	4
					5	Int.	★	MVS1210X05S130	102.2	4.024	106.2	4.181	169.2	6.661	167	6.575	2.2	.087	13	.512	4
					5	Int.	●	MVS1210X05S140	102.2	4.024	106.2	4.181	169.2	6.661	167	6.575	2.2	.087	14	.551	4
					8	Int.	□	MVS1210X08S130	140.2	5.520	145.2	5.717	208.2	8.197	206	8.110	2.2	.087	13	.512	4
					8	Int.	●	MVS1210X08S140	140.2	5.520	145.2	5.717	208.2	8.197	206	8.110	2.2	.087	14	.551	4
12.2	.4803				2	Ext.	★	MVE1220X02S130	53.2	2.094	56.2	2.213	104.2	4.102	102	4.016	2.2	.087	13	.512	2
					2	Ext.	●	MVE1220X02S140	53.2	2.094	56.2	2.213	104.2	4.102	102	4.016	2.2	.087	14	.551	2
					3	Ext.	★	MVE1220X03S130	78.2	3.079	81.2	3.197	139.2	5.480	137	5.394	2.2	.087	13	.512	2
					3	Ext.	□	MVE1220X03S140	78.2	3.079	81.2	3.197	139.2	5.480	137	5.394	2.2	.087	14	.551	2
					3	Int.	★	MVS1220X03S130	64.7	2.547	67.2	2.646	130.2	5.126	128	5.039	2.2	.087	13	.512	4
					3	Int.	●	MVS1220X03S140	64.7	2.547	67.2	2.646	130.2	5.126	128	5.039	2.2	.087	14	.551	4
					5	Int.	★	MVS1220X05S130	102.2	4.024	106.2	4.181	169.2	6.661	167	6.575	2.2	.087	13	.512	4
					5	Int.	●	MVS1220X05S140	102.2	4.024	106.2	4.181	169.2	6.661	167	6.575	2.2	.087	14	.551	4
					8	Int.	□	MVS1220X08S130	140.2	5.520	145.2	5.717	208.2	8.197	206	8.110	2.2	.087	13	.512	4
					8	Int.	●	MVS1220X08S140	140.2	5.520	145.2	5.717	208.2	8.197	206	8.110	2.2	.087	14	.551	4
12.3	.4843			9/16-12	2	Ext.	★	MVE1230X02S130	53.2	2.094	56.2	2.213	104.2	4.102	102	4.016	2.2	.087	13	.512	2
					2	Ext.	●	MVE1230X02S140	53.2	2.094	56.2	2.213	104.2	4.102	102	4.016	2.2	.087	14	.551	2
					3	Ext.	★	MVE1230X03S130	78.2	3.079	81.2	3.197	139.2	5.480	137	5.394	2.2	.087	13	.512	2
					3	Ext.	□	MVE1230X03S140	78.2	3.079	81.2	3.197	139.2	5.480	137	5.394	2.2	.087	14	.551	2
					3	Int.	★	MVS1230X03S130	64.7	2.547	67.2	2.646	130.2	5.126	128	5.039	2.2	.087	13	.512	4
					3	Int.	●	MVS1230X03S140	64.7	2.547	67.2	2.646	130.2	5.126	128	5.039	2.2	.087	14	.551	4
					5	Int.	★	MVS1230X05S130	102.2	4.024	106.2	4.181	169.2	6.661	167	6.575	2.2	.087	13	.512	4
					5	Int.	●	MVS1230X05S140	102.2	4.024	106.2	4.181	169.2	6.661	167	6.575	2.2	.087	14	.551	4
					8	Int.	□	MVS1230X08S130	140.2	5.520	145.2	5.717	208.2	8.197	206	8.110	2.2	.087	13	.512	4
					8	Int.	●	MVS1230X08S140	140.2	5.520	145.2	5.717	208.2	8.197	206	8.110	2.2	.087	14	.551	4
12.4	.4882				2	Ext.	★	MVE1240X02S130	53.3	2.098	56.3	2.217	104.3	4.106	102	4.016	2.3	.091	13	.512	2
					2	Ext.	●	MVE1240X02S140	53.3	2.098	56.3	2.217	104.3	4.106	102	4.016	2.3	.091	14	.551	2
					3	Ext.	★	MVE1240X03S130	78.3	3.083	81.3	3.201	139.3	5.484	137	5.394	2.3	.091	13	.512	2
					3	Ext.	□	MVE1240X03S140	78.3	3.083	81.3	3.201	139.3	5.484	137	5.394	2.3	.091	14	.551	2
					3	Int.	★	MVS1240X03S130	64.8	2.551	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	13	.512	4
					3	Int.	●	MVS1240X03S140	64.8	2.551	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	14	.551	4
					5	Int.	★	MVS1240X05S130	102.3	4.028	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13	.512	4
					5	Int.	●	MVS1240X05S140	102.3	4.028	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	14	.551	4
					8	Int.	□	MVS1240X08S130	140.3	5.524	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	13	.512	4
					8	Int.	●	MVS1240X08S140	140.3	5.524	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	14	.551	4

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

MVE/MVS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
12.5	.4921			M14x4.5	2	Ext.	★	MVE1250X02S130	53.3	2.098	56.3	2.217	104.3	4.106	102	4.016	2.3	.091	13	.512	2
					2	Ext.	●	MVE1250X02S140	53.3	2.098	56.3	2.217	104.3	4.106	102	4.016	2.3	.091	14	.551	2
					3	Ext.	★	MVE1250X03S130	78.3	3.083	81.3	3.201	139.3	5.484	137	5.394	2.3	.091	13	.512	2
					3	Ext.	□	MVE1250X03S140	78.3	3.083	81.3	3.201	139.3	5.484	137	5.394	2.3	.091	14	.551	2
					3	Int.	★	MVS1250X03S130	64.8	2.551	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	13	.512	4
					3	Int.	●	MVS1250X03S140	64.8	2.551	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	14	.551	4
					5	Int.	★	MVS1250X05S130	102.3	4.028	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13	.512	4
					5	Int.	●	MVS1250X05S140	102.3	4.028	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	14	.551	4
					8	Int.	★	MVS1250X08S130	140.3	5.524	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	13	.512	4
					8	Int.	●	MVS1250X08S140	140.3	5.524	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	14	.551	4
12.6	.4961				2	Ext.	★	MVE1260X02S130	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	13	.512	2
					2	Ext.	●	MVE1260X02S140	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	14	.551	2
					3	Ext.	★	MVE1260X03S130	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	13	.512	2
					3	Ext.	□	MVE1260X03S140	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	14	.551	2
					3	Int.	★	MVS1260X03S130	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	13	.512	4
					3	Int.	●	MVS1260X03S140	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	14	.551	4
					5	Int.	★	MVS1260X05S130	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13	.512	4
					5	Int.	●	MVS1260X05S140	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	14	.551	4
					8	Int.	□	MVS1260X08S130	145.3	5.720	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	13	.512	4
					8	Int.	●	MVS1260X08S140	145.3	5.720	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	14	.551	4
12.7	.5000	1/2			2	Ext.	★	MVE1270X02S130	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	13	.512	2
					2	Ext.	●	MVE1270X02S140	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	14	.551	2
					3	Ext.	★	MVE1270X03S130	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	13	.512	2
					3	Ext.	□	MVE1270X03S140	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	14	.551	2
					3	Int.	★	MVS1270X03S130	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	13	.512	4
					3	Int.	●	MVS1270X03S140	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	14	.551	4
					5	Int.	★	MVS1270X05S130	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13	.512	4
					5	Int.	●	MVS1270X05S140	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	14	.551	4
					8	Int.	□	MVS1270X08S130	145.3	5.720	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	13	.512	4
					8	Int.	●	MVS1270X08S140	145.3	5.720	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	14	.551	4
12.8	.5039				2	Ext.	★	MVE1280X02S130	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	13	.512	2
					2	Ext.	●	MVE1280X02S140	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	14	.551	2
					3	Ext.	★	MVE1280X03S130	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	13	.512	2
					3	Ext.	□	MVE1280X03S140	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	14	.551	2
					3	Int.	★	MVS1280X03S130	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	13	.512	4
					3	Int.	●	MVS1280X03S140	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	14	.551	4
					5	Int.	★	MVS1280X05S130	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13	.512	4
					5	Int.	●	MVS1280X05S140	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	14	.551	4
					8	Int.	□	MVS1280X08S130	145.3	5.720	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	13	.512	4
					8	Int.	●	MVS1280X08S140	145.3	5.720	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	14	.551	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

□ : Non stock, produced to order only.

NEW

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
12.9	.5079				2	Ext.	★	MVE1290X02S130	53.4	2.102	53.4	2.102	104.4	4.110	102	4.016	2.4	.094	13	.512	2
					2	Ext.	●	MVE1290X02S140	53.4	2.102	53.4	2.102	104.4	4.110	102	4.016	2.4	.094	14	.551	2
					3	Ext.	★	MVE1290X03S130	80.4	3.165	80.4	3.165	139.4	5.488	137	5.394	2.4	.094	13	.512	2
					3	Ext.	□	MVE1290X03S140	80.4	3.165	80.4	3.165	139.4	5.488	137	5.394	2.4	.094	14	.551	2
					3	Int.	★	MVS1290X03S130	67.4	2.654	67.4	2.654	130.4	5.134	128	5.039	2.4	.094	13	.512	4
					3	Int.	●	MVS1290X03S140	67.4	2.654	67.4	2.654	130.4	5.134	128	5.039	2.4	.094	14	.551	4
					5	Int.	★	MVS1290X05S130	106.4	4.189	106.4	4.189	169.4	6.669	167	6.575	2.4	.094	13	.512	4
					5	Int.	●	MVS1290X05S140	106.4	4.189	106.4	4.189	169.4	6.669	167	6.575	2.4	.094	14	.551	4
					8	Int.	□	MVS1290X08S130	145.4	5.724	145.4	5.724	208.4	8.205	206	8.110	2.4	.094	13	.512	4
					8	Int.	●	MVS1290X08S140	145.4	5.724	145.4	5.724	208.4	8.205	206	8.110	2.4	.094	14	.551	4
13.0	.5118				2	Ext.	★	MVE1300X02S130	53.4	2.102	53.4	2.102	104.4	4.110	102	4.016	2.4	.094	13	.512	2
					2	Ext.	●	MVE1300X02S140	53.4	2.102	53.4	2.102	104.4	4.110	102	4.016	2.4	.094	14	.551	2
					3	Ext.	★	MVE1300X03S130	80.4	3.165	80.4	3.165	139.4	5.488	137	5.394	2.4	.094	13	.512	2
					3	Ext.	□	MVE1300X03S140	80.4	3.165	80.4	3.165	139.4	5.488	137	5.394	2.4	.094	14	.551	2
					3	Int.	★	MVS1300X03S130	67.4	2.654	67.4	2.654	130.4	5.134	128	5.039	2.4	.094	13	.512	4
					3	Int.	●	MVS1300X03S140	67.4	2.654	67.4	2.654	130.4	5.134	128	5.039	2.4	.094	14	.551	4
					5	Int.	★	MVS1300X05S130	106.4	4.189	106.4	4.189	169.4	6.669	167	6.575	2.4	.094	13	.512	4
					5	Int.	●	MVS1300X05S140	106.4	4.189	106.4	4.189	169.4	6.669	167	6.575	2.4	.094	14	.551	4
					8	Int.	★	MVS1300X08S130	145.4	5.724	145.4	5.724	208.4	8.205	206	8.110	2.4	.094	13	.512	4
					8	Int.	●	MVS1300X08S140	145.4	5.724	145.4	5.724	208.4	8.205	206	8.110	2.4	.094	14	.551	4
13.1	.5157	33/64		9/16-18	2	Ext.	●	MVE1310X02S140	56.4	2.220	59.4	2.339	109.4	4.307	107	4.213	2.4	.094	14	.551	2
					3	Ext.	★	MVE1310X03S140	86.4	3.402	89.4	3.520	149.4	5.882	147	5.787	2.4	.094	14	.551	2
					3	Int.	●	MVS1310X03S140	69.9	2.752	72.4	2.850	136.4	5.370	134	5.276	2.4	.094	14	.551	4
					5	Int.	●	MVS1310X05S140	110.4	4.346	114.4	4.504	178.4	7.024	176	6.929	2.4	.094	14	.551	4
					8	Int.	●	MVS1310X08S140	151.4	5.961	156.4	6.157	220.4	8.677	218	8.583	2.4	.094	14	.551	4
13.2	.5197				2	Ext.	●	MVE1320X02S140	56.4	2.220	59.4	2.339	109.4	4.307	107	4.213	2.4	.094	14	.551	2
					3	Ext.	★	MVE1320X03S140	86.4	3.402	89.4	3.520	149.4	5.882	147	5.787	2.4	.094	14	.551	2
					3	Int.	●	MVS1320X03S140	69.9	2.752	72.4	2.850	136.4	5.370	134	5.276	2.4	.094	14	.551	4
					5	Int.	●	MVS1320X05S140	110.4	4.346	114.4	4.504	178.4	7.024	176	6.929	2.4	.094	14	.551	4
					8	Int.	●	MVS1320X08S140	151.4	5.961	156.4	6.157	220.4	8.677	218	8.583	2.4	.094	14	.551	4
13.3	.5236				2	Ext.	●	MVE1330X02S140	56.4	2.220	59.4	2.339	109.4	4.307	107	4.213	2.4	.094	14	.551	2
					3	Ext.	★	MVE1330X03S140	86.4	3.402	89.4	3.520	149.4	5.882	147	5.787	2.4	.094	14	.551	2
					3	Int.	●	MVS1330X03S140	69.9	2.752	72.4	2.850	136.4	5.370	134	5.276	2.4	.094	14	.551	4
					5	Int.	●	MVS1330X05S140	110.4	4.346	114.4	4.504	178.4	7.024	176	6.929	2.4	.094	14	.551	4
					8	Int.	●	MVS1330X08S140	151.4	5.961	156.4	6.157	220.4	8.677	218	8.583	2.4	.094	14	.551	4
13.4	.5276				2	Ext.	●	MVE1340X02S140	56.4	2.220	59.4	2.339	109.4	4.307	107	4.213	2.4	.094	14	.551	2
					3	Ext.	★	MVE1340X03S140	86.4	3.402	89.4	3.520	149.4	5.882	147	5.787	2.4	.094	14	.551	2
					3	Int.	●	MVS1340X03S140	69.9	2.752	72.4	2.850	136.4	5.370	134	5.276	2.4	.094	14	.551	4
					5	Int.	●	MVS1340X05S140	110.4	4.346	114.4	4.504	178.4	7.024	176	6.929	2.4	.094	14	.551	4
					8	Int.	●	MVS1340X08S140	151.4	5.961	156.4	6.157	220.4	8.677	218	8.583	2.4	.094	14	.551	4

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

MVE/MVS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
13.5	.5315			5/8-11	2	Ext.	●	MVE1350X02S140	56.5	2.224	59.5	2.343	109.5	4.311	107	4.213	2.5	.098	14	.551	2
					3	Ext.	★	MVE1350X03S140	86.5	3.406	89.5	3.524	149.5	5.886	147	5.787	2.5	.098	14	.551	2
					3	Int.	●	MVS1350X03S140	70.0	2.756	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14	.551	4
					5	Int.	●	MVS1350X05S140	110.5	4.350	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14	.551	4
					8	Int.	●	MVS1350X08S140	151.5	5.965	156.5	6.161	220.5	8.681	218	8.583	2.5	.098	14	.551	4
13.6	.5354				2	Ext.	●	MVE1360X02S140	56.5	2.224	56.5	2.224	109.5	4.311	107	4.213	2.5	.098	14	.551	2
					3	Ext.	★	MVE1360X03S140	88.5	3.484	88.5	3.484	149.5	5.886	147	5.787	2.5	.098	14	.551	2
					3	Int.	●	MVS1360X03S140	72.5	2.854	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14	.551	4
					5	Int.	●	MVS1360X05S140	114.5	4.508	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14	.551	4
					8	Int.	●	MVS1360X08S140	156.5	6.161	156.5	6.161	220.5	8.681	218	8.583	2.5	.098	14	.551	4
13.7	.5394				2	Ext.	●	MVE1370X02S140	56.5	2.224	56.5	2.224	109.5	4.311	107	4.213	2.5	.098	14	.551	2
					3	Ext.	★	MVE1370X03S140	88.5	3.484	88.5	3.484	149.5	5.886	147	5.787	2.5	.098	14	.551	2
					3	Int.	●	MVS1370X03S140	72.5	2.854	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14	.551	4
					5	Int.	●	MVS1370X05S140	114.5	4.508	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14	.551	4
					8	Int.	●	MVS1370X08S140	156.5	6.161	156.5	6.161	220.5	8.681	218	8.583	2.5	.098	14	.551	4
13.8	.5433				2	Ext.	●	MVE1380X02S140	56.5	2.224	56.5	2.224	109.5	4.311	107	4.213	2.5	.098	14	.551	2
					3	Ext.	★	MVE1380X03S140	88.5	3.484	88.5	3.484	149.5	5.886	147	5.787	2.5	.098	14	.551	2
					3	Int.	●	MVS1380X03S140	72.5	2.854	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14	.551	4
					5	Int.	●	MVS1380X05S140	114.5	4.508	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14	.551	4
					8	Int.	●	MVS1380X08S140	156.5	6.161	156.5	6.161	220.5	8.681	218	8.583	2.5	.098	14	.551	4
13.891	.5469	35/64			2	Ext.	●	MVE1389X02S140	56.5	2.224	56.5	2.224	109.5	4.311	107	4.213	2.5	.098	14	.551	2
					3	Int.	●	MVS1389X03S140	72.5	2.854	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14	.551	4
					5	Int.	●	MVS1389X05S140	114.5	4.508	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14	.551	4
					8	Int.	●	MVS1389X08S140	156.5	6.161	156.5	6.161	220.5	8.681	218	8.583	2.5	.098	14	.551	4
13.9	.5472				2	Ext.	●	MVE1390X02S140	56.5	2.224	56.5	2.224	109.5	4.311	107	4.213	2.5	.098	14	.551	2
					3	Ext.	★	MVE1390X03S140	88.5	3.484	88.5	3.484	149.5	5.886	147	5.787	2.5	.098	14	.551	2
					3	Int.	●	MVS1390X03S140	72.5	2.854	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14	.551	4
					5	Int.	●	MVS1390X05S140	114.5	4.508	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14	.551	4
					8	Int.	●	MVS1390X08S140	156.5	6.161	156.5	6.161	220.5	8.681	218	8.583	2.5	.098	14	.551	4
14.0	.5512			M16x2.0	2	Ext.	●	MVE1400X02S140	56.6	2.228	56.6	2.228	109.6	4.315	107	4.213	2.6	.102	14	.551	2
					3	Ext.	★	MVE1400X03S140	88.6	3.488	88.6	3.488	149.6	5.890	147	5.787	2.6	.102	14	.551	2
					3	Int.	●	MVS1400X03S140	72.6	2.858	72.6	2.858	136.6	5.378	134	5.276	2.6	.102	14	.551	4
					5	Int.	●	MVS1400X05S140	114.6	4.512	114.6	4.512	178.6	7.031	176	6.929	2.6	.102	14	.551	4
					8	Int.	●	MVS1400X08S140	156.6	6.165	156.6	6.165	220.6	8.685	218	8.583	2.6	.102	14	.551	4
14.1	.5551				2	Ext.	★	MVE1410X02S150	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	15	.591	2
					2	Ext.	●	MVE1410X02S160	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	16	.630	2
					3	Ext.	★	MVE1410X03S150	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	15	.591	2
					3	Ext.	□	MVE1410X03S160	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	16	.630	2
					3	Int.	★	MVS1410X03S150	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	15	.591	4
					3	Int.	●	MVS1410X03S160	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	16	.630	4
					5	Int.	★	MVS1410X05S150	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	15	.591	4
					5	Int.	●	MVS1410X05S160	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	16	.630	4
					8	Int.	□	MVS1410X08S150	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	15	.591	4
					8	Int.	●	MVS1410X08S160	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	16	.630	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

□ : Non stock, produced to order only.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
14.2	.5591				2	Ext.	★	MVE1420X02S150	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	15	.591	2
					2	Ext.	●	MVE1420X02S160	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	16	.630	2
					3	Ext.	★	MVE1420X03S150	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	15	.591	2
					3	Ext.	□	MVE1420X03S160	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	16	.630	2
					3	Int.	★	MVS1420X03S150	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	15	.591	4
					3	Int.	●	MVS1420X03S160	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	16	.630	4
					5	Int.	★	MVS1420X05S150	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	15	.591	4
					5	Int.	●	MVS1420X05S160	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	16	.630	4
					8	Int.	★	MVS1420X08S150	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	15	.591	4
					8	Int.	●	MVS1420X08S160	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	16	.630	4
14.288	.5625	9/16			2	Ext.	●	MVE1429X02S160	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	16	.630	2
					3	Int.	●	MVS1429X03S160	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	16	.630	4
					5	Int.	●	MVS1429X05S160	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	16	.630	4
					8	Int.	●	MVS1429X08S160	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	16	.630	4
14.3	.5630				2	Ext.	★	MVE1430X02S150	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	15	.591	2
					2	Ext.	●	MVE1430X02S160	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	16	.630	2
					3	Ext.	★	MVE1430X03S150	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	15	.591	2
					3	Ext.	□	MVE1430X03S160	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	16	.630	2
					3	Int.	★	MVS1430X03S150	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	15	.591	4
					3	Int.	●	MVS1430X03S160	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	16	.630	4
					5	Int.	★	MVS1430X05S150	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	15	.591	4
					5	Int.	●	MVS1430X05S160	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	16	.630	4
					8	Int.	□	MVS1430X08S150	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	15	.591	4
					8	Int.	●	MVS1430X08S160	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	16	.630	4
14.4	.5669				2	Ext.	★	MVE1440X02S150	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	15	.591	2
					2	Ext.	●	MVE1440X02S160	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	16	.630	2
					3	Ext.	★	MVE1440X03S150	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	15	.591	2
					3	Ext.	□	MVE1440X03S160	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	16	.630	2
					3	Int.	★	MVS1440X03S150	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	15	.591	4
					3	Int.	●	MVS1440X03S160	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	16	.630	4
					5	Int.	★	MVS1440X05S150	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	15	.591	4
					5	Int.	●	MVS1440X05S160	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	16	.630	4
					8	Int.	□	MVS1440X08S150	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	15	.591	4
					8	Int.	●	MVS1440X08S160	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	16	.630	4
14.5	.5709			M16x1.5	2	Ext.	★	MVE1450X02S150	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	15	.591	2
					2	Ext.	●	MVE1450X02S160	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	16	.630	2
					3	Ext.	★	MVE1450X03S150	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	15	.591	2
					3	Ext.	□	MVE1450X03S160	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	16	.630	2
					3	Int.	★	MVS1450X03S150	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	15	.591	4
					3	Int.	●	MVS1450X03S160	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	16	.630	4
					5	Int.	★	MVS1450X05S150	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	15	.591	4
					5	Int.	●	MVS1450X05S160	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	16	.630	4
					8	Int.	★	MVS1450X08S150	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	15	.591	4
					8	Int.	●	MVS1450X08S160	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	16	.630	4

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

MVE/MVS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
14.6	.5748				2	Ext.	★	MVE1460X02S150	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	15	.591	2
					2	Ext.	●	MVE1460X02S160	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	16	.630	2
					3	Ext.	★	MVE1460X03S150	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	15	.591	2
					3	Ext.	□	MVE1460X03S160	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	16	.630	2
					3	Int.	★	MVS1460X03S150	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	15	.591	4
					3	Int.	●	MVS1460X03S160	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	16	.630	4
					5	Int.	★	MVS1460X05S150	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	15	.591	4
					5	Int.	●	MVS1460X05S160	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	16	.630	4
					8	Int.	□	MVS1460X08S150	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	15	.591	4
					8	Int.	●	MVS1460X08S160	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	16	.630	4
14.684	.5781	37/64		5/8-18	2	Ext.	●	MVE1468X02S160	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	16	.630	2
					3	Int.	●	MVS1468X03S160	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	16	.630	4
					5	Int.	●	MVS1468X05S160	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	16	.630	4
					8	Int.	●	MVS1468X08S160	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	16	.630	4
14.7	.5787				2	Ext.	★	MVE1470X02S150	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	15	.591	2
					2	Ext.	●	MVE1470X02S160	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	16	.630	2
					3	Ext.	★	MVE1470X03S150	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	15	.591	2
					3	Ext.	□	MVE1470X03S160	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	16	.630	2
					3	Int.	★	MVS1470X03S150	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	15	.591	4
					3	Int.	●	MVS1470X03S160	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	16	.630	4
					5	Int.	★	MVS1470X05S150	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	15	.591	4
					5	Int.	●	MVS1470X05S160	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	16	.630	4
					8	Int.	□	MVS1470X08S150	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	15	.591	4
					8	Int.	●	MVS1470X08S160	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	16	.630	4
14.8	.5827				2	Ext.	★	MVE1480X02S150	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	15	.591	2
					2	Ext.	●	MVE1480X02S160	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	16	.630	2
					3	Ext.	★	MVE1480X03S150	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	15	.591	2
					3	Ext.	□	MVE1480X03S160	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	16	.630	2
					3	Int.	★	MVS1480X03S150	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	15	.591	4
					3	Int.	●	MVS1480X03S160	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	16	.630	4
					5	Int.	★	MVS1480X05S150	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	15	.591	4
					5	Int.	●	MVS1480X05S160	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	16	.630	4
					8	Int.	□	MVS1480X08S150	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	15	.591	4
					8	Int.	●	MVS1480X08S160	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	16	.630	4
14.9	.5866				2	Ext.	★	MVE1490X02S150	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	15	.591	2
					2	Ext.	●	MVE1490X02S160	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	16	.630	2
					3	Ext.	★	MVE1490X03S150	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	15	.591	2
					3	Ext.	□	MVE1490X03S160	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	16	.630	2
					3	Int.	★	MVS1490X03S150	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	15	.591	4
					3	Int.	●	MVS1490X03S160	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	16	.630	4
					5	Int.	★	MVS1490X05S150	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	15	.591	4
					5	Int.	●	MVS1490X05S160	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	16	.630	4
					8	Int.	□	MVS1490X08S150	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	15	.591	4
					8	Int.	●	MVS1490X08S160	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	16	.630	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

□ : Non stock, produced to order only.

NEW

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
15.0	.5906				2	Ext.	★	MVE1500X02S150	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	15	.591	2
					2	Ext.	●	MVE1500X02S160	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	16	.630	2
					3	Ext.	★	MVE1500X03S150	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	15	.591	2
					3	Ext.	□	MVE1500X03S160	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	16	.630	2
					3	Int.	★	MVS1500X03S150	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	15	.591	4
					3	Int.	●	MVS1500X03S160	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	16	.630	4
					5	Int.	★	MVS1500X05S150	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	15	.591	4
					5	Int.	●	MVS1500X05S160	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	16	.630	4
					8	Int.	★	MVS1500X08S150	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	15	.591	4
					8	Int.	●	MVS1500X08S160	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	16	.630	4
15.081	.5938	19/32			2	Ext.	●	MVE1508X02S160	60.7	2.390	63.7	2.508	117.7	4.634	115	4.528	2.7	.106	16	.630	2
					3	Int.	●	MVS1508X03S160	80.2	3.157	82.7	3.256	147.7	5.815	145	5.709	2.7	.106	16	.630	4
					5	Int.	●	MVS1508X05S160	126.7	4.988	130.7	5.146	195.7	7.705	193	7.598	2.7	.106	16	.630	4
					8	Int.	●	MVS1508X08S160	173.7	6.839	183.7	7.232	243.7	9.594	241	9.488	2.7	.106	16	.630	4
15.1	.5945				2	Ext.	●	MVE1510X02S160	60.8	2.394	63.8	2.512	117.8	4.638	115	4.528	2.8	.110	16	.630	2
					3	Ext.	★	MVE1510X03S160	96.8	3.811	99.8	3.929	162.8	6.409	160	6.299	2.8	.110	16	.630	2
					3	Int.	●	MVS1510X03S160	80.3	3.161	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16	.630	4
					5	Int.	●	MVS1510X05S160	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16	.630	4
					8	Int.	●	MVS1510X08S160	173.8	6.843	183.8	7.236	243.8	9.598	241	9.488	2.8	.110	16	.630	4
15.2	.5984				2	Ext.	●	MVE1520X02S160	60.8	2.394	63.8	2.512	117.8	4.638	115	4.528	2.8	.110	16	.630	2
					3	Ext.	★	MVE1520X03S160	96.8	3.811	99.8	3.929	162.8	6.409	160	6.299	2.8	.110	16	.630	2
					3	Int.	●	MVS1520X03S160	80.3	3.161	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16	.630	4
					5	Int.	●	MVS1520X05S160	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16	.630	4
					8	Int.	●	MVS1520X08S160	173.8	6.843	183.8	7.236	243.8	9.598	241	9.488	2.8	.110	16	.630	4
15.3	.6024				2	Ext.	●	MVE1530X02S160	60.8	2.394	63.8	2.512	117.8	4.638	115	4.528	2.8	.110	16	.630	2
					3	Ext.	★	MVE1530X03S160	96.8	3.811	99.8	3.929	162.8	6.409	160	6.299	2.8	.110	16	.630	2
					3	Int.	●	MVS1530X03S160	80.3	3.161	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16	.630	4
					5	Int.	●	MVS1530X05S160	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16	.630	4
					8	Int.	●	MVS1530X08S160	173.8	6.843	183.8	7.236	243.8	9.598	241	9.488	2.8	.110	16	.630	4
15.4	.6063				2	Ext.	●	MVE1540X02S160	60.8	2.394	63.8	2.512	117.8	4.638	115	4.528	2.8	.110	16	.630	2
					3	Ext.	★	MVE1540X03S160	96.8	3.811	99.8	3.929	162.8	6.409	160	6.299	2.8	.110	16	.630	2
					3	Int.	●	MVS1540X03S160	80.3	3.161	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16	.630	4
					5	Int.	●	MVS1540X05S160	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16	.630	4
					8	Int.	●	MVS1540X08S160	173.8	6.843	183.8	7.236	243.8	9.598	241	9.488	2.8	.110	16	.630	4
15.478	.6094	39/64			2	Ext.	●	MVE1548X02S160	60.8	2.394	63.8	2.512	117.8	4.638	115	4.528	2.8	.110	16	.630	2
					3	Int.	●	MVS1548X03S160	80.3	3.161	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16	.630	4
					5	Int.	●	MVS1548X05S160	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16	.630	4
					8	Int.	●	MVS1548X08S160	173.8	6.843	183.8	7.236	243.8	9.598	241	9.488	2.8	.110	16	.630	4
15.5	.6102			M18x2.5	2	Ext.	●	MVE1550X02S160	60.8	2.394	63.8	2.512	117.8	4.638	115	4.528	2.8	.110	16	.630	2
					3	Ext.	★	MVE1550X03S160	96.8	3.811	99.8	3.929	162.8	6.409	160	6.299	2.8	.110	16	.630	2
					3	Int.	●	MVS1550X03S160	80.3	3.161	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16	.630	4
					5	Int.	●	MVS1550X05S160	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16	.630	4
					8	Int.	●	MVS1550X08S160	173.8	6.843	183.8	7.236	243.8	9.598	241	9.488	2.8	.110	16	.630	4

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

MVE/MVS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
15.6	.6142				2	Ext.	●	MVE1560X02S160	60.8	2.394	60.8	2.394	117.8	4.638	115	4.528	2.8	.110	16	.630	2
					3	Ext.	★	MVE1560X03S160	98.8	3.890	98.8	3.890	162.8	6.409	160	6.299	2.8	.110	16	.630	2
					3	Int.	●	MVS1560X03S160	82.8	3.260	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16	.630	4
					5	Int.	●	MVS1560X05S160	130.8	5.150	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16	.630	4
					8	Int.	●	MVS1560X08S160	178.8	7.039	183.8	7.236	243.8	9.598	241	9.488	2.8	.110	16	.630	4
15.7	.6181				2	Ext.	●	MVE1570X02S160	60.9	2.398	60.9	2.398	117.9	4.642	115	4.528	2.9	.114	16	.630	2
					3	Ext.	★	MVE1570X03S160	98.9	3.894	98.9	3.894	162.9	6.413	160	6.299	2.9	.114	16	.630	2
					3	Int.	●	MVS1570X03S160	82.9	3.264	82.9	3.264	147.9	5.823	145	5.709	2.9	.114	16	.630	4
					5	Int.	●	MVS1570X05S160	130.9	5.154	130.9	5.154	195.9	7.713	193	7.598	2.9	.114	16	.630	4
					8	Int.	●	MVS1570X08S160	178.9	7.043	183.9	7.240	243.9	9.602	241	9.488	2.9	.114	16	.630	4
15.8	.6220				2	Ext.	●	MVE1580X02S160	60.9	2.398	60.9	2.398	117.9	4.642	115	4.528	2.9	.114	16	.630	2
					3	Ext.	★	MVE1580X03S160	98.9	3.894	98.9	3.894	162.9	6.413	160	6.299	2.9	.114	16	.630	2
					3	Int.	●	MVS1580X03S160	82.9	3.264	82.9	3.264	147.9	5.823	145	5.709	2.9	.114	16	.630	4
					5	Int.	●	MVS1580X05S160	130.9	5.154	130.9	5.154	195.9	7.713	193	7.598	2.9	.114	16	.630	4
					8	Int.	●	MVS1580X08S160	178.9	7.043	183.9	7.240	243.9	9.602	241	9.488	2.9	.114	16	.630	4
15.875	.6250	5/8			2	Ext.	●	MVE1588X02S160	60.9	2.398	60.9	2.398	117.9	4.642	115	4.528	2.9	.114	16	.630	2
					3	Int.	●	MVS1588X03S160	82.9	3.264	82.9	3.264	147.9	5.823	145	5.709	2.9	.114	16	.630	4
					5	Int.	●	MVS1588X05S160	130.9	5.154	130.9	5.154	195.9	7.713	193	7.598	2.9	.114	16	.630	4
					8	Int.	●	MVS1588X08S160	178.9	7.043	183.9	7.240	243.9	9.602	241	9.488	2.9	.114	16	.630	4
15.9	.6260				2	Ext.	●	MVE1590X02S160	60.9	2.398	60.9	2.398	117.9	4.642	115	4.528	2.9	.114	16	.630	2
					3	Ext.	★	MVE1590X03S160	98.9	3.894	98.9	3.894	162.9	6.413	160	6.299	2.9	.114	16	.630	2
					3	Int.	●	MVS1590X03S160	82.9	3.264	82.9	3.264	147.9	5.823	145	5.709	2.9	.114	16	.630	4
					5	Int.	●	MVS1590X05S160	130.9	5.154	130.9	5.154	195.9	7.713	193	7.598	2.9	.114	16	.630	4
					8	Int.	●	MVS1590X08S160	178.9	7.043	183.9	7.240	243.9	9.602	241	9.488	2.9	.114	16	.630	4
16.0	.6299				2	Ext.	●	MVE1600X02S160	60.9	2.398	60.9	2.398	117.9	4.642	115	4.528	2.9	.114	16	.630	2
					3	Ext.	★	MVE1600X03S160	98.9	3.894	98.9	3.894	162.9	6.413	160	6.299	2.9	.114	16	.630	2
					3	Int.	●	MVS1600X03S160	82.9	3.264	82.9	3.264	147.9	5.823	145	5.709	2.9	.114	16	.630	4
					5	Int.	●	MVS1600X05S160	130.9	5.154	130.9	5.154	195.9	7.713	193	7.598	2.9	.114	16	.630	4
					8	Int.	●	MVS1600X08S160	178.9	7.043	183.9	7.240	243.9	9.602	241	9.488	2.9	.114	16	.630	4
16.1	.6339				2	Ext.	□	MVE1610X02S170	62.9	2.476	62.9	2.476	121.9	4.799	119	4.685	2.9	.114	17	.669	2
					2	Ext.	□	MVE1610X02S180	62.9	2.476	62.9	2.476	121.9	4.799	119	4.685	2.9	.114	18	.709	2
					3	Ext.	□	MVE1610X03S170	104.9	4.130	104.9	4.130	169.9	6.689	167	6.575	2.9	.114	17	.669	2
					3	Ext.	□	MVE1610X03S180	104.9	4.130	104.9	4.130	169.9	6.689	167	6.575	2.9	.114	18	.709	2
					3	Int.	□	MVS1610X03S170	85.4	3.362	87.9	3.461	152.9	6.020	150	5.906	2.9	.114	17	.669	4
					3	Int.	□	MVS1610X03S180	85.4	3.362	87.9	3.461	152.9	6.020	150	5.906	2.9	.114	18	.709	4
					5	Int.	□	MVS1610X05S170	134.9	5.311	138.9	5.469	203.9	8.028	201	7.913	2.9	.114	17	.669	4
					5	Int.	□	MVS1610X05S180	134.9	5.311	138.9	5.469	203.9	8.028	201	7.913	2.9	.114	18	.709	4
16.2	.6378				2	Ext.	★	MVE1620X02S170	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	17	.669	2
					2	Ext.	□	MVE1620X02S180	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	18	.709	2
					3	Ext.	□	MVE1620X03S170	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	17	.669	2
					3	Ext.	□	MVE1620X03S180	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	18	.709	2
					3	Int.	□	MVS1620X03S170	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	17	.669	4
					3	Int.	□	MVS1620X03S180	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	18	.709	4
					5	Int.	□	MVS1620X05S170	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	17	.669	4
					5	Int.	□	MVS1620X05S180	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	18	.709	4

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● : Inventory maintained. ★ : Inventory maintained in Japan.

□ : Non stock, produced to order only.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
16.272	.6406	41/64			2	Ext.	●	MVE1627X02S180	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	18	.709	2
					3	Int.	●	MVS1627X03S180	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	18	.709	4
					5	Int.	●	MVS1627X05S180	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	18	.709	4
16.3	.6417				2	Ext.	★	MVE1630X02S170	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	17	.669	2
					2	Ext.	□	MVE1630X02S180	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	30	.118	18	.709	2
					3	Ext.	□	MVE1630X03S170	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	17	.669	2
					3	Ext.	□	MVE1630X03S180	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	18	.709	2
					3	Int.	□	MVS1630X03S170	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	17	.669	4
					3	Int.	□	MVS1630X03S180	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	18	.709	4
					5	Int.	□	MVS1630X05S170	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	17	.669	4
					5	Int.	□	MVS1630X05S180	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	18	.709	4
16.4	.6457				2	Ext.	□	MVE1640X02S170	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	17	.669	2
					2	Ext.	□	MVE1640X02S180	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	18	.709	2
					3	Ext.	□	MVE1640X03S170	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	17	.669	2
					3	Ext.	□	MVE1640X03S180	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	18	.709	2
					3	Int.	□	MVS1640X03S170	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	17	.669	4
					3	Int.	□	MVS1640X03S180	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	18	.709	4
					5	Int.	□	MVS1640X05S170	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	17	.669	4
					5	Int.	□	MVS1640X05S180	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	18	.709	4
16.5	.6496			M18x1.5	2	Ext.	★	MVE1650X02S170	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	17	.669	2
					2	Ext.	●	MVE1650X02S180	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	18	.709	2
					3	Ext.	★	MVE1650X03S170	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	17	.669	2
					3	Ext.	□	MVE1650X03S180	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	18	.709	2
					3	Int.	★	MVS1650X03S170	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	17	.669	4
					3	Int.	●	MVS1650X03S180	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	18	.709	4
					5	Int.	★	MVS1650X05S170	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	17	.669	4
					5	Int.	●	MVS1650X05S180	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	18	.709	4
16.6	.6535				2	Ext.	□	MVE1660X02S170	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	17	.669	2
					2	Ext.	□	MVE1660X02S180	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	18	.709	2
					3	Ext.	□	MVE1660X03S170	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	17	.669	2
					3	Ext.	□	MVE1660X03S180	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	18	.709	2
					3	Int.	□	MVS1660X03S170	88.0	3.465	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	17	.669	4
					3	Int.	□	MVS1660X03S180	88.0	3.465	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	18	.709	4
					5	Int.	□	MVS1660X05S170	139.0	5.472	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	17	.669	4
					5	Int.	□	MVS1660X05S180	139.0	5.472	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	18	.709	4
16.669	.6562	21/32		3/4-10	2	Ext.	●	MVE1667X02S180	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	18	.709	2
					3	Int.	●	MVS1667X03S180	88.0	3.465	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	18	.709	4
					5	Int.	●	MVS1667X05S180	139.0	5.472	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	18	.709	4
16.7	.6575				2	Ext.	□	MVE1670X02S170	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	17	.669	2
					2	Ext.	□	MVE1670X02S180	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	18	.709	2
					3	Ext.	□	MVE1670X03S170	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	17	.669	2
					3	Ext.	□	MVE1670X03S180	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	18	.709	2
					3	Int.	□	MVS1670X03S170	88.0	3.465	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	17	.669	4
					3	Int.	□	MVS1670X03S180	88.0	3.465	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	18	.709	4
					5	Int.	□	MVS1670X05S170	139.0	5.472	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	17	.669	4
					5	Int.	□	MVS1670X05S180	139.0	5.472	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	18	.709	4

DRILLING

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

MVE/MVS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
16.8	.6614				2	Ext.	□	MVE1680X02S170	63.1	2.484	63.1	2.484	122.1	4.807	119	4.685	3.1	.122	17	.669	2
					2	Ext.	□	MVE1680X02S180	63.1	2.484	63.1	2.484	122.1	4.807	119	4.685	3.1	.122	18	.709	2
					3	Ext.	□	MVE1680X03S170	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	17	.669	2
					3	Ext.	□	MVE1680X03S180	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	18	.709	2
					3	Int.	□	MVS1680X03S170	88.1	3.469	88.1	3.469	153.1	6.028	150	5.906	3.1	.122	17	.669	4
					3	Int.	□	MVS1680X03S180	88.1	3.469	88.1	3.469	153.1	6.028	150	5.906	3.1	.122	18	.709	4
					5	Int.	□	MVS1680X05S170	139.1	5.476	139.1	5.476	204.1	8.035	201	7.913	3.1	.122	17	.669	4
					5	Int.	□	MVS1680X05S180	139.1	5.476	139.1	5.476	204.1	8.035	201	7.913	3.1	.122	18	.709	4
16.9	.6654				2	Ext.	□	MVE1690X02S170	63.1	2.484	63.1	2.484	122.1	4.807	119	4.685	3.1	.122	17	.669	2
					2	Ext.	□	MVE1690X02S180	63.1	2.484	63.1	2.484	122.1	4.807	119	4.685	3.1	.122	18	.709	2
					3	Ext.	□	MVE1690X03S170	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	17	.669	2
					3	Ext.	□	MVE1690X03S180	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	18	.709	2
					3	Int.	□	MVS1690X03S170	88.1	3.469	88.1	3.469	153.1	6.028	150	5.906	3.1	.122	17	.669	4
					3	Int.	□	MVS1690X03S180	88.1	3.469	88.1	3.469	153.1	6.028	150	5.906	3.1	.122	18	.709	4
					5	Int.	□	MVS1690X05S170	139.1	5.476	139.1	5.476	204.1	8.035	201	7.913	3.1	.122	17	.669	4
					5	Int.	□	MVS1690X05S180	139.1	5.476	139.1	5.476	204.1	8.035	201	7.913	3.1	.122	18	.709	4
17.0	.6693		Tube Sheet		2	Ext.	★	MVE1700X02S170	63.1	2.484	63.1	2.484	122.1	4.807	119	4.685	3.1	.122	17	.669	2
					2	Ext.	●	MVE1700X02S180	63.1	2.484	63.1	2.484	122.1	4.807	119	4.685	3.1	.122	18	.709	2
					3	Ext.	★	MVE1700X03S170	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	17	.669	2
					3	Ext.	□	MVE1700X03S180	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	18	.709	2
					3	Int.	★	MVS1700X03S170	88.1	3.469	88.1	3.469	153.1	6.028	150	5.906	3.1	.122	17	.669	4
					3	Int.	●	MVS1700X03S180	88.1	3.469	88.1	3.469	153.1	6.028	150	5.906	3.1	.122	18	.709	4
					5	Int.	★	MVS1700X05S170	139.1	5.476	139.1	5.476	204.1	8.035	201	7.913	3.1	.122	17	.669	4
					5	Int.	●	MVS1700X05S180	139.1	5.476	139.1	5.476	204.1	8.035	201	7.913	3.1	.122	18	.709	4
17.066	.6719	43/64			2	Ext.	●	MVE1707X02S180	65.1	2.563	65.1	2.563	126.1	4.965	123	4.843	3.1	.122	18	.709	2
					3	Int.	●	MVS1707X03S180	90.6	3.567	93.1	3.665	158.1	6.224	155	6.102	3.1	.122	18	.709	4
					5	Int.	●	MVS1707X05S180	143.1	5.634	147.1	5.791	212.1	8.350	209	8.228	3.1	.122	18	.709	4
17.1	.6732				2	Ext.	□	MVE1710X02S180	65.1	2.563	65.1	2.563	126.1	4.965	123	4.843	3.1	.122	18	.709	2
					3	Ext.	□	MVE1710X03S180	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	18	.709	2
					3	Int.	□	MVS1710X03S180	90.6	3.567	93.1	3.665	158.1	6.224	155	6.102	3.1	.122	18	.709	4
					5	Int.	□	MVS1710X05S180	143.1	5.634	147.1	5.791	212.1	8.350	209	8.228	3.1	.122	18	.709	4
17.2	.6772				2	Ext.	□	MVE1720X02S180	65.1	2.563	65.1	2.563	126.1	4.965	123	4.843	3.1	.122	18	.709	2
					3	Ext.	□	MVE1720X03S180	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	18	.709	2
					3	Int.	□	MVS1720X03S180	90.6	3.567	93.1	3.665	158.1	6.224	155	6.102	3.1	.122	18	.709	4
					5	Int.	□	MVS1720X05S180	143.1	5.634	147.1	5.791	212.1	8.350	209	8.228	3.1	.122	18	.709	4
17.3	.6811				2	Ext.	□	MVE1730X02S180	65.2	2.567	65.2	2.567	126.2	4.969	123	4.843	3.2	.126	18	.709	2
					3	Ext.	□	MVE1730X03S180	105.2	4.142	105.2	4.142	170.2	6.701	167	6.575	3.2	.126	18	.709	2
					3	Int.	□	MVS1730X03S180	90.7	3.571	93.2	3.669	158.2	6.228	155	6.102	3.2	.126	18	.709	4
					5	Int.	□	MVS1730X05S180	143.2	5.638	147.2	5.795	212.2	8.354	209	8.228	3.2	.126	18	.709	4
17.4	.6850				2	Ext.	□	MVE1740X02S180	65.2	2.567	65.2	2.567	126.2	4.969	123	4.843	3.2	.126	18	.709	2
					3	Ext.	□	MVE1740X03S180	105.2	4.142	105.2	4.142	170.2	6.701	167	6.575	3.2	.126	18	.709	2
					3	Int.	□	MVS1740X03S180	90.7	3.571	93.2	3.669	158.2	6.228	155	6.102	3.2	.126	18	.709	4
					5	Int.	□	MVS1740X05S180	143.2	5.638	147.2	5.795	212.2	8.354	209	8.228	3.2	.126	18	.709	4
17.463	.6875	11/16		3/4-16	2	Ext.	●	MVE1746X02S180	65.2	2.567	65.2	2.567	126.2	4.969	123	4.843	3.2	.126	18	.709	2
					3	Int.	●	MVS1746X03S180	90.7	3.571	93.2	3.669	158.2	6.228	155	6.102	3.2	.126	18	.709	4
					5	Int.	●	MVS1746X05S180	143.2	5.638	147.2	5.795	212.2	8.354	209	8.228	3.2	.126	18	.709	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

□ : Non stock, produced to order only.

NEW	DC				Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
17.5	.6890			M20x2.5	2	Ext.	●	MVE1750X02S180	65.2	2.567	65.2	2.567	126.2	4.969	123	4.843	3.2	.126	18	.709	2
					3	Ext.	★	MVE1750X03S180	105.2	4.142	105.2	4.142	170.2	6.701	167	6.575	3.2	.126	18	.709	2
					3	Int.	●	MVS1750X03S180	90.7	3.571	93.2	3.669	158.2	6.228	155	6.102	3.2	.126	18	.709	4
					5	Int.	●	MVS1750X05S180	143.2	5.638	147.2	5.795	212.2	8.354	209	8.228	3.2	.126	18	.709	4
17.6	.6929				2	Ext.	□	MVE1760X02S180	65.2	2.567	65.2	2.567	126.2	4.969	123	4.843	3.2	.126	18	.709	2
					3	Ext.	□	MVE1760X03S180	105.2	4.142	105.2	4.142	170.2	6.701	167	6.575	3.2	.126	18	.709	2
					3	Int.	□	MVS1760X03S180	93.2	3.669	93.2	3.669	158.2	6.228	155	6.102	3.2	.126	18	.709	4
					5	Int.	□	MVS1760X05S180	147.2	5.795	147.2	5.795	212.2	8.354	209	8.228	3.2	.126	18	.709	4
17.7	.6969				2	Ext.	□	MVE1770X02S180	65.2	2.567	65.2	2.567	126.2	4.969	123	4.843	3.2	.126	18	.709	2
					3	Ext.	□	MVE1770X03S180	105.2	4.142	105.2	4.142	170.2	6.701	167	6.575	3.2	.126	18	.709	2
					3	Int.	□	MVS1770X03S180	93.2	3.669	93.2	3.669	158.2	6.228	155	6.102	3.2	.126	18	.709	4
					5	Int.	□	MVS1770X05S180	147.2	5.795	147.2	5.795	212.2	8.354	209	8.228	3.2	.126	18	.709	4
17.8	.7008				2	Ext.	★	MVE1780X02S180	65.2	2.567	65.2	2.567	126.2	4.969	123	4.843	3.2	.126	18	.709	2
					3	Ext.	□	MVE1780X03S180	105.2	4.142	105.2	4.142	170.2	6.701	167	6.575	3.2	.126	18	.709	2
					3	Int.	□	MVS1780X03S180	93.2	3.669	93.2	3.669	158.2	6.228	155	6.102	3.2	.126	18	.709	4
					5	Int.	□	MVS1780X05S180	147.2	5.795	147.2	5.795	212.2	8.354	209	8.228	3.2	.126	18	.709	4
17.859	.7031	45/64			2	Ext.	●	MVE1786X02S180	65.3	2.571	65.3	2.571	126.3	4.972	123	4.843	3.3	.130	18	.709	2
					3	Int.	●	MVS1786X03S180	93.3	3.673	93.3	3.673	158.3	6.232	155	6.102	3.3	.130	18	.709	4
					5	Int.	●	MVS1786X05S180	147.3	5.799	147.3	5.799	212.3	8.358	209	8.228	3.3	.130	18	.709	4
17.9	.7047				2	Ext.	□	MVE1790X02S180	65.3	2.571	65.3	2.571	126.3	4.972	123	4.843	3.3	.130	18	.709	2
					3	Ext.	□	MVE1790X03S180	105.3	4.146	105.3	4.146	170.3	6.705	167	6.575	3.3	.130	18	.709	2
					3	Int.	□	MVS1790X03S180	93.3	3.673	93.3	3.673	158.3	6.232	155	6.102	3.3	.130	18	.709	4
					5	Int.	□	MVS1790X05S180	147.3	5.799	147.3	5.799	212.3	8.358	209	8.228	3.3	.130	18	.709	4
18.0	.7087				2	Ext.	●	MVE1800X02S180	65.3	2.571	65.3	2.571	126.3	4.972	123	4.843	3.3	.130	18	.709	2
					3	Ext.	★	MVE1800X03S180	105.3	4.146	105.3	4.146	170.3	6.705	167	6.575	3.3	.130	18	.709	2
					3	Int.	●	MVS1800X03S180	93.3	3.673	93.3	3.673	158.3	6.232	155	6.102	3.3	.130	18	.709	4
					5	Int.	●	MVS1800X05S180	147.3	5.799	147.3	5.799	212.3	8.358	209	8.228	3.3	.130	18	.709	4
18.1	.7126				2	Ext.	□	MVE1810X02S190	67.3	2.650	67.3	2.650	130.3	5.130	127	5.000	3.3	.130	19	.748	2
					2	Ext.	□	MVE1810X02S200	67.3	2.650	67.3	2.650	130.3	5.130	127	5.000	3.3	.130	20	.787	2
					3	Ext.	□	MVE1810X03S190	117.3	4.618	117.3	4.618	182.3	7.177	179	7.047	3.3	.130	19	.748	2
					3	Ext.	□	MVE1810X03S200	117.3	4.618	117.3	4.618	182.3	7.177	179	7.047	3.3	.130	20	.787	2
					3	Int.	□	MVS1810X03S190	95.8	3.772	98.3	3.870	163.3	6.429	160	6.299	3.3	.130	19	.748	4
					3	Int.	□	MVS1810X03S200	95.8	3.772	98.3	3.870	163.3	6.429	160	6.299	3.3	.130	20	.787	4
					5	Int.	□	MVS1810X05S190	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	19	.748	4
					5	Int.	□	MVS1810X05S200	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	20	.787	4
18.2	.7165				2	Ext.	□	MVE1820X02S190	67.3	2.650	67.3	2.650	130.3	5.130	127	5.000	3.3	.130	19	.748	2
					2	Ext.	□	MVE1820X02S200	67.3	2.650	67.3	2.650	130.3	5.130	127	5.000	3.3	.130	20	.787	2
					3	Ext.	□	MVE1820X03S190	117.3	4.618	117.3	4.618	182.3	7.177	179	7.047	3.3	.130	19	.748	2
					3	Ext.	□	MVE1820X03S200	117.3	4.618	117.3	4.618	182.3	7.177	179	7.047	3.3	.130	20	.787	2
					3	Int.	□	MVS1820X03S190	95.8	3.772	98.3	3.870	163.3	6.429	160	6.299	3.3	.130	19	.748	4
					3	Int.	□	MVS1820X03S200	95.8	3.772	98.3	3.870	163.3	6.429	160	6.299	3.3	.130	20	.787	4
					5	Int.	□	MVS1820X05S190	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	19	.748	4
					5	Int.	□	MVS1820X05S200	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	20	.787	4
18.256	.7188	23/32			2	Ext.	●	MVE1826X02S200	67.3	2.650	67.3	2.650	130.3	5.130	127	5.000	3.3	.130	20	.787	2
					3	Int.	●	MVS1826X03S200	95.8	3.772	98.3	3.870	163.3	6.429	160	6.299	3.3	.130	20	.787	4
					5	Int.	●	MVS1826X05S200	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	20	.787	4

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

MVE/MVS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
18.3	.7205				2	Ext.	□	MVE1830X02S190	67.3	2.650	67.3	2.650	130.3	5.130	127	5.000	3.3	.130	19	.748	2
					2	Ext.	□	MVE1830X02S200	67.3	2.650	67.3	2.650	130.3	5.130	127	5.000	3.3	.130	20	.787	2
					3	Ext.	□	MVE1830X03S190	117.3	4.618	117.3	4.618	182.3	7.177	179	7.047	3.3	.130	19	.748	2
					3	Ext.	□	MVE1830X03S200	117.3	4.618	117.3	4.618	182.3	7.177	179	7.047	3.3	.130	20	.787	2
					3	Int.	□	MVS1830X03S190	95.8	3.772	98.3	3.870	163.3	6.429	160	6.299	3.3	.130	19	.748	4
					3	Int.	□	MVS1830X03S200	95.8	3.772	98.3	3.870	163.3	6.429	160	6.299	3.3	.130	20	.787	4
					5	Int.	□	MVS1830X05S190	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	19	.748	4
					5	Int.	□	MVS1830X05S200	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	20	.787	4
18.4	.7244				2	Ext.	□	MVE1840X02S190	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	19	.748	2
					2	Ext.	□	MVE1840X02S200	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	20	.787	2
					3	Ext.	□	MVE1840X03S190	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	19	.748	2
					3	Ext.	□	MVE1840X03S200	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	20	.787	2
					3	Int.	□	MVS1840X03S190	95.9	3.776	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	19	.748	4
					3	Int.	□	MVS1840X03S200	95.9	3.776	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	20	.787	4
					5	Int.	□	MVS1840X05S190	151.4	5.961	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	19	.748	4
					5	Int.	□	MVS1840X05S200	151.4	5.961	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	20	.787	4
18.5	.7283			M20x1.5	2	Ext.	★	MVE1850X02S190	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	19	.748	2
					2	Ext.	●	MVE1850X02S200	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	20	.787	2
					3	Ext.	★	MVE1850X03S190	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	19	.748	2
					3	Ext.	□	MVE1850X03S200	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	20	.787	2
					3	Int.	★	MVS1850X03S190	95.9	3.776	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	19	.748	4
					3	Int.	●	MVS1850X03S200	95.9	3.776	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	20	.787	4
					5	Int.	★	MVS1850X05S190	151.4	5.961	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	19	.748	4
					5	Int.	●	MVS1850X05S200	151.4	5.961	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	20	.787	4
18.6	.7323				2	Ext.	□	MVE1860X02S190	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	19	.748	2
					2	Ext.	□	MVE1860X02S200	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	20	.787	2
					3	Ext.	□	MVE1860X03S190	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	19	.748	2
					3	Ext.	□	MVE1860X03S200	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	20	.787	2
					3	Int.	□	MVS1860X03S190	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	19	.748	4
					3	Int.	□	MVS1860X03S200	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	20	.787	4
					5	Int.	□	MVS1860X05S190	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	19	.748	4
					5	Int.	□	MVS1860X05S200	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	20	.787	4
18.654	.7344	47/64			2	Ext.	●	MVE1865X02S200	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	20	.787	2
					3	Int.	●	MVS1865X03S200	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	20	.787	4
					5	Int.	●	MVS1865X05S200	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	20	.787	4
18.7	.7362				2	Ext.	□	MVE1870X02S190	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	19	.748	2
					2	Ext.	□	MVE1870X02S200	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	20	.787	2
					3	Ext.	□	MVE1870X03S190	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	19	.748	2
					3	Ext.	□	MVE1870X03S200	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	20	.787	2
					3	Int.	□	MVS1870X03S190	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	19	.748	4
					3	Int.	□	MVS1870X03S200	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	20	.787	4
					5	Int.	□	MVS1870X05S190	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	19	.748	4
					5	Int.	□	MVS1870X05S200	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	20	.787	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

□ : Non stock, produced to order only.

NEW

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
18.8	.7402				2	Ext.	□	MVE1880X02S190	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	19	.748	2
					2	Ext.	□	MVE1880X02S200	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	20	.787	2
					3	Ext.	□	MVE1880X03S190	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	19	.748	2
					3	Ext.	□	MVE1880X03S200	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	20	.787	2
					3	Int.	□	MVS1880X03S190	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	19	.748	4
					3	Int.	□	MVS1880X03S200	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	20	.787	4
					5	Int.	□	MVS1880X05S190	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	19	.748	4
					5	Int.	□	MVS1880X05S200	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	20	.787	4
18.9	.7441				2	Ext.	□	MVE1890X02S190	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	19	.748	2
					2	Ext.	□	MVE1890X02S200	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	20	.787	2
					3	Ext.	□	MVE1890X03S190	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	19	.748	2
					3	Ext.	□	MVE1890X03S200	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	20	.787	2
					3	Int.	□	MVS1890X03S190	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	19	.748	4
					3	Int.	□	MVS1890X03S200	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	20	.787	4
					5	Int.	□	MVS1890X05S190	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	19	.748	4
					5	Int.	□	MVS1890X05S200	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	20	.787	4
19.0	.7480				2	Ext.	★	MVE1900X02S190	67.5	2.657	67.5	2.657	130.5	5.138	127	5.000	3.5	.138	19	.748	2
					2	Ext.	●	MVE1900X02S200	67.5	2.657	67.5	2.657	130.5	5.138	127	5.000	3.5	.138	20	.787	2
					3	Ext.	★	MVE1900X03S190	117.5	4.626	117.5	4.626	182.5	7.185	179	7.047	3.5	.138	19	.748	2
					3	Ext.	□	MVE1900X03S200	117.5	4.626	117.5	4.626	182.5	7.185	179	7.047	3.5	.138	20	.787	2
					3	Int.	★	MVS1900X03S190	98.5	3.878	98.5	3.878	163.5	6.437	160	6.299	3.5	.138	19	.748	4
					3	Int.	●	MVS1900X03S200	98.5	3.878	98.5	3.878	163.5	6.437	160	6.299	3.5	.138	20	.787	4
					5	Int.	★	MVS1900X05S190	155.5	6.122	155.5	6.122	220.5	8.681	217	8.543	3.5	.138	19	.748	4
					5	Int.	●	MVS1900X05S200	155.5	6.122	155.5	6.122	220.5	8.681	217	8.543	3.5	.138	20	.787	4
19.050	.7500	3/4			2	Ext.	●	MVE1905X02S200	69.5	2.736	69.5	2.736	134.5	5.295	131	5.157	3.5	.138	20	.787	2
					3	Int.	●	MVS1905X03S200	101.0	3.976	103.5	4.075	168.5	6.634	165	6.496	3.5	.138	20	.787	4
					5	Int.	●	MVS1905X05S200	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	20	.787	4
19.1	.7520				2	Ext.	□	MVE1910X02S200	69.5	2.736	69.5	2.736	134.5	5.295	131	5.157	3.5	.138	20	.787	2
					3	Ext.	□	MVE1910X03S200	117.5	4.626	117.5	4.626	182.5	7.185	179	7.047	3.5	.138	20	.787	2
					3	Int.	□	MVS1910X03S200	101.0	3.976	103.5	4.075	168.5	6.634	165	6.496	3.5	.138	20	.787	4
					5	Int.	□	MVS1910X05S200	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	20	.787	4
19.2	.7559				2	Ext.	□	MVE1920X02S200	69.5	2.736	69.5	2.736	134.5	5.295	131	5.157	3.5	.138	20	.787	2
					3	Ext.	□	MVE1920X03S200	117.5	4.626	117.5	4.626	182.5	7.185	179	7.047	3.5	.138	20	.787	2
					3	Int.	□	MVS1920X03S200	101.0	3.976	103.5	4.075	168.5	6.634	165	6.496	3.5	.138	20	.787	4
					5	Int.	□	MVS1920X05S200	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	20	.787	4
19.250	.7579		Tube Sheet		2	Ext.	●	MVE1925X02S200	69.5	2.736	69.5	2.736	134.5	5.295	131	5.157	3.5	.138	20	.787	2
					3	Int.	●	MVS1925X03S200	101.0	3.976	103.5	4.075	168.5	6.634	165	6.496	3.5	.138	20	.787	4
					5	Int.	●	MVS1925X05S200	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	20	.787	4
19.3	.7598				2	Ext.	□	MVE1930X02S200	69.5	2.736	69.5	2.736	134.5	5.295	131	5.157	3.5	.138	20	.787	2
					3	Ext.	□	MVE1930X03S200	117.5	4.626	117.5	4.626	182.5	7.185	179	7.047	3.5	.138	20	.787	2
					3	Int.	□	MVS1930X03S200	101.0	3.976	103.5	4.075	168.5	6.634	165	6.496	3.5	.138	20	.787	4
					5	Int.	□	MVS1930X05S200	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	20	.787	4
19.4	.7638				2	Ext.	□	MVE1940X02S200	69.5	2.736	69.5	2.736	134.5	5.295	131	5.157	3.5	.138	20	.787	2
					3	Ext.	□	MVE1940X03S200	117.5	4.626	117.5	4.626	182.5	7.185	179	7.047	3.5	.138	20	.787	2
					3	Int.	□	MVS1940X03S200	101.0	3.976	103.5	4.075	168.5	6.634	165	6.496	3.5	.138	20	.787	4
					5	Int.	□	MVS1940X05S200	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	20	.787	4

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

MVE/MVS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP1020		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
19.447	.7656	49/64		7/8-9	2	Ext.	●	MVE1945X02S200	69.5	2.736	69.5	2.736	134.5	5.295	131	5.157	3.5	.138	20	.787	2
					3	Int.	●	MVS1945X03S200	101.0	3.976	103.5	4.075	168.5	6.634	165	6.496	3.5	.138	20	.787	4
					5	Int.	●	MVS1945X05S200	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	20	.787	4
19.5	.7677			M22x2.5	2	Ext.	●	MVE1950X02S200	69.6	2.740	69.6	2.740	134.6	5.299	131	5.157	3.6	.142	20	.787	2
					3	Ext.	★	MVE1950X03S200	117.6	4.630	117.6	4.630	182.6	7.189	179	7.047	3.6	.142	20	.787	2
					3	Int.	●	MVS1950X03S200	101.1	3.980	103.6	4.079	168.6	6.638	165	6.496	3.6	.142	20	.787	4
					5	Int.	●	MVS1950X05S200	159.6	6.283	163.6	6.441	228.6	9.000	225	8.858	3.6	.142	20	.787	4
19.6	.7717				2	Ext.	□	MVE1960X02S200	69.6	2.740	69.6	2.740	134.6	5.299	131	5.157	3.6	.142	20	.787	2
					3	Ext.	□	MVE1960X03S200	117.6	4.630	117.6	4.630	182.6	7.189	179	7.047	3.6	.142	20	.787	2
					3	Int.	□	MVS1960X03S200	103.6	4.079	103.6	4.079	168.6	6.638	165	6.496	3.6	.142	20	.787	4
					5	Int.	□	MVS1960X05S200	163.6	6.441	163.6	6.441	228.6	9.000	225	8.858	3.6	.142	20	.787	4
19.7	.7756				2	Ext.	□	MVE1970X02S200	69.6	2.740	69.6	2.740	134.6	5.299	131	5.157	3.6	.142	20	.787	2
					3	Ext.	□	MVE1970X03S200	117.6	4.630	117.6	4.630	182.6	7.189	179	7.047	3.6	.142	20	.787	2
					3	Int.	□	MVS1970X03S200	103.6	4.079	103.6	4.079	168.6	6.638	165	6.496	3.6	.142	20	.787	4
					5	Int.	□	MVS1970X05S200	163.6	6.441	163.6	6.441	228.6	9.000	225	8.858	3.6	.142	20	.787	4
19.8	.7795				2	Ext.	□	MVE1980X02S200	69.6	2.740	69.6	2.740	134.6	5.299	131	5.157	3.6	.142	20	.787	2
					3	Ext.	□	MVE1980X03S200	117.6	4.630	117.6	4.630	182.6	7.189	179	7.047	3.6	.142	20	.787	2
					3	Int.	□	MVS1980X03S200	103.6	4.079	103.6	4.079	168.6	6.638	165	6.496	3.6	.142	20	.787	4
					5	Int.	□	MVS1980X05S200	163.6	6.441	163.6	6.441	228.6	9.000	225	8.858	3.6	.142	20	.787	4
19.844	.7812	25/32			2	Ext.	●	MVE1984X02S200	69.6	2.740	69.6	2.740	134.6	5.299	131	5.157	3.6	.142	20	.787	2
					3	Int.	●	MVS1984X03S200	103.6	4.079	103.6	4.079	168.6	6.638	165	6.496	3.6	.142	20	.787	4
					5	Int.	●	MVS1984X05S200	163.6	6.441	163.6	6.441	228.6	9.000	225	8.858	3.6	.142	20	.787	4
19.9	.7835				2	Ext.	□	MVE1990X02S200	69.6	2.740	69.6	2.740	134.6	5.299	131	5.157	3.6	.142	20	.787	2
					3	Ext.	□	MVE1990X03S200	117.6	4.630	117.6	4.630	182.6	7.189	179	7.047	3.6	.142	20	.787	2
					3	Int.	□	MVS1990X03S200	103.6	4.079	103.6	4.079	168.6	6.638	165	6.496	3.6	.142	20	.787	4
					5	Int.	□	MVS1990X05S200	163.6	6.441	163.6	6.441	228.6	9.000	225	8.858	3.6	.142	20	.787	4
20.0	.7874				2	Ext.	●	MVE2000X02S200	69.6	2.740	69.6	2.740	134.6	5.299	131	5.157	3.6	.142	20	.787	2
					3	Ext.	★	MVE2000X03S200	117.6	4.630	117.6	4.630	182.6	7.189	179	7.047	3.6	.142	20	.787	2
					3	Int.	●	MVS2000X03S200	103.6	4.079	103.6	4.079	168.6	6.638	165	6.496	3.6	.142	20	.787	4
					5	Int.	●	MVS2000X05S200	163.6	6.441	163.6	6.441	228.6	9.000	225	8.858	3.6	.142	20	.787	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.

CUTTING CONDITIONS ➤ L041
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

MVE

Work Material		Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.1260	3.2	215 (165—245)	.0039 (.0024—.0051)	195 (150—230)	.0039 (.0024—.0051)
.1575	4.0	230 (180—260)	.0047 (.0031—.0063)	215 (165—245)	.0047 (.0031—.0063)
.1969	5.0	230 (180—260)	.0059 (.0039—.0079)	215 (165—245)	.0059 (.0039—.0079)
.2480	6.3	265 (195—295)	.0079 (.0051—.0102)	245 (195—280)	.0079 (.0051—.0102)
.3150	8.0	280 (215—330)	.0091 (.0071—.0110)	265 (195—295)	.0091 (.0071—.0110)
.3937	10.0	295 (230—345)	.0106 (.0087—.0126)	280 (215—330)	.0106 (.0087—.0126)
.4724	12.0	310 (245—360)	.0122 (.0110—.0134)	295 (230—345)	.0122 (.0110—.0134)
.6299	16.0	330 (260—375)	.0130 (.0110—.0150)	295 (230—345)	.0130 (.0110—.0150)
.7874	20.0	330 (260—375)	.0118 (.0118—.0157)	295 (230—345)	.0118 (.0118—.0157)

Work Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.1260	3.2	180 (130—215)	.0035 (.0024—.0047)	65 (50—80)	.0028 (.0020—.0031)
.1575	4.0	195 (150—230)	.0043 (.0028—.0055)	65 (50—80)	.0031 (.0024—.0039)
.1969	5.0	195 (150—230)	.0055 (.0035—.0071)	65 (50—80)	.0039 (.0028—.0051)
.2480	6.3	230 (180—260)	.0071 (.0043—.0094)	80 (65—100)	.0051 (.0035—.0067)
.3150	8.0	245 (195—280)	.0083 (.0063—.0098)	80 (65—100)	.0055 (.0039—.0071)
.3937	10.0	265 (195—295)	.0091 (.0075—.0106)	80 (65—100)	.0063 (.0047—.0075)
.4724	12.0	280 (215—330)	.0102 (.0091—.0114)	80 (65—100)	.0071 (.0059—.0079)
.6299	16.0	280 (215—330)	.0114 (.0094—.0130)	80 (65—100)	.0075 (.0059—.0091)
.7874	20.0	280 (215—330)	.0118 (.0102—.0134)	80 (65—100)	.0079 (.0059—.0094)

Work Material		Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-40-8 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.1260	3.2	230 (180—260)	.0039 (.0024—.0051)	215 (165—245)	.0039 (.0024—.0051)
.1575	4.0	230 (180—260)	.0047 (.0031—.0063)	215 (165—245)	.0047 (.0031—.0063)
.1969	5.0	230 (180—260)	.0059 (.0039—.0079)	215 (165—245)	.0059 (.0039—.0079)
.2480	6.3	245 (195—280)	.0079 (.0051—.0102)	230 (180—260)	.0079 (.0051—.0102)
.3150	8.0	245 (195—280)	.0098 (.0071—.0122)	230 (180—260)	.0091 (.0071—.0110)
.3937	10.0	245 (195—280)	.0114 (.0087—.0138)	230 (180—260)	.0106 (.0087—.0126)
.4724	12.0	265 (195—295)	.0130 (.0110—.0146)	245 (195—280)	.0122 (.0110—.0134)
.6299	16.0	265 (195—295)	.0138 (.0110—.0165)	245 (195—280)	.0130 (.0110—.0150)
.7874	20.0	280 (215—330)	.0146 (.0118—.0173)	265 (195—295)	.0138 (.0118—.0157)

(Note) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MVE/MVS

RECOMMENDED CUTTING CONDITIONS

MVE

Work Material		Aluminium Alloy (Si<5%) ASTM A6061, 7075 etc.		Heat Resistant Alloy Inconel718 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.1260	3.2	265 (195—295)	.0039 (.0024—.0051)	65 (50—80)	.0028 (.0020—.0035)
.1575	4.0	265 (195—295)	.0047 (.0031—.0063)	65 (50—80)	.0035 (.0024—.0043)
.1969	5.0	265 (195—295)	.0059 (.0039—.0079)	65 (50—80)	.0043 (.0031—.0055)
.2480	6.3	295 (230—360)	.0079 (.0051—.0102)	80 (65—100)	.0055 (.0035—.0075)
.3150	8.0	295 (230—360)	.0091 (.0071—.0110)	80 (65—100)	.0055 (.0043—.0067)
.3937	10.0	295 (230—360)	.0106 (.0087—.0126)	80 (65—100)	.0063 (.0047—.0075)
.4724	12.0	330 (260—395)	.0122 (.0110—.0134)	80 (65—100)	.0063 (.0051—.0071)
.6299	16.0	330 (260—395)	.0130 (.0110—.0150)	80 (65—100)	.0071 (.0055—.0083)
.7874	20.0	360 (280—425)	.0138 (.0118—.0157)	100 (65—115)	.0075 (.0059—.0087)

Work Material		Hardened Steel (40—55HRC) AISI H13, L6 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm		
.1260	3.2	65 (50—80)	.0028 (.0020—.0035)
.1575	4.0	65 (50—80)	.0035 (.0024—.0043)
.1969	5.0	65 (50—80)	.0043 (.0031—.0055)
.2480	6.3	80 (65—100)	.0055 (.0035—.0075)
.3150	8.0	80 (65—100)	.0055 (.0043—.0067)
.3937	10.0	80 (65—100)	.0063 (.0047—.0075)
.4724	12.0	80 (65—100)	.0063 (.0051—.0071)
.6299	16.0	80 (65—100)	.0071 (.0055—.0083)
.7874	20.0	100 (65—115)	.0075 (.0059—.0087)

(Note) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

RECOMMENDED CUTTING CONDITIONS

MVS

Work Material			Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.	
Drill Dia. **DC** inch	Drill Dia. **DC** mm	**L/D**	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
.0394	1.0	**2,7DC**	165 (130—195)	.0016 (.0008—.0020)	165 (130—195)	.0016 (.0008—.0020)
		≥12DC	165 (130—195)	.0008 (.0004—.0012)	130 (100—150)	.0008 (.0004—.0012)
.0591	1.5	**2,7DC**	165 (130—195)	.0020 (.0012—.0031)	165 (130—195)	.0020 (.0012—.0031)
		≥12DC	165 (130—195)	.0020 (.0008—.0031)	130 (100—150)	.0020 (.0012—.0031)
.0787	2.0	**2,7DC**	165 (130—195)	.0028 (.0016—.0039)	165 (130—195)	.0028 (.0016—.0039)
		≥12DC	165 (130—195)	.0028 (.0016—.0039)	165 (130—195)	.0028 (.0016—.0039)
.0984	2.5	**2,7DC**	195 (150—230)	.0035 (.0020—.0051)	195 (150—230)	.0035 (.0020—.0051)
		≥12DC	195 (150—230)	.0035 (.0024—.0051)	165 (130—195)	.0035 (.0024—.0051)
.1260	3.2	**3DC,5DC,8DC**	295 (230—345)	.0039 (.0024—.0051)	265 (195—295)	.0039 (.0024—.0051)
.1575	4.0	**3DC,5DC,8DC**	330 (260—375)	.0047 (.0031—.0063)	295 (230—345)	.0047 (.0031—.0063)
.1969	5.0	**3DC,5DC,8DC**	330 (260—375)	.0059 (.0039—.0079)	295 (230—345)	.0059 (.0039—.0079)
.2480	6.3	**3DC,5DC,8DC**	360 (280—410)	.0079 (.0051—.0102)	330 (260—375)	.0079 (.0051—.0102)
.3150	8.0	**3DC,5DC,8DC**	395 (310—445)	.0091 (.0071—.0110)	360 (280—410)	.0091 (.0071—.0110)
.3937	10.0	**3DC,5DC,8DC**	425 (330—490)	.0106 (.0087—.0126)	395 (310—445)	.0106 (.0087—.0126)
.4724	12.0	**3DC,5DC,8DC**	460 (360—525)	.0118 (.0102—.0134)	425 (330—490)	.0118 (.0102—.0134)
.6299	16.0	**3DC,5DC,8DC**	525 (410—590)	.0130 (.0106—.0150)	460 (360—525)	.0130 (.0106—.0150)
.7874	20.0	**3DC,5DC,8DC**	525 (410—590)	.0138 (.0118—.0157)	460 (360—525)	.0138 (.0118—.0157)

Work Material			Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.	
Drill Dia. **DC** inch	Drill Dia. **DC** mm	**L/D**	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
.0394	1.0	**2,7DC**	130 (100—150)	.0016 (.0008—.0020)	100 (65—115)	.0012 (.0008—.0020)
		≥12DC	100 (65—115)	.0008 (.0004—.0012)	100 (65—115)	.0008 (.0004—.0012)
.0591	1.5	**2,7DC**	130 (100—150)	.0017 (.0012—.0031)	100 (65—115)	.0020 (.0012—.0028)
		≥12DC	100 (65—115)	.0017 (.0008—.0031)	100 (65—115)	.0020 (.0008—.0031)
.0787	2.0	**2,7DC**	130 (100—150)	.0028 (.0016—.0039)	100 (65—115)	.0024 (.0016—.0031)
		≥12DC	165 (130—195)	.0028 (.0016—.0039)	100 (65—115)	.0028 (.0016—.0039)
.0984	2.5	**2,7DC**	165 (130—195)	0035 (.0020—.0051)	130 (100—150)	.0031 (.0020—.0039)
		≥12DC	165 (130—195)	0031 (.0020—.0051)	100 (65—115)	.0031 (.0020—.0047)
.1260	3.2	**3DC,5DC,8DC**	230 (180—260)	.0039 (.0024—.0051)	130 (100—150)	.0031 (.0024—.0039)
.1575	4.0	**3DC,5DC,8DC**	265 (195—295)	.0043 (.0028—.0055)	130 (100—150)	.0035 (.0024—.0043)
.1969	5.0	**3DC,5DC,8DC**	265 (195—295)	.0055 (.0035—.0071)	130 (100—150)	.0043 (.0031—.0055)
.2480	6.3	**3DC,5DC,8DC**	295 (230—345)	.0071 (.0043—.0094)	165 (130—195)	.0055 (.0035—.0071)
.3150	8.0	**3DC,5DC,8DC**	330 (260—375)	.0083 (.0063—.0098)	165 (130—195)	.0059 (.0039—.0075)
.3937	10.0	**3DC,5DC,8DC**	360 (280—410)	.0091 (.0075—.0106)	165 (130—195)	.0063 (.0047—.0079)
.4724	12.0	**3DC,5DC,8DC**	395 (310—445)	.0102 (.0087—.0114)	195 (150—230)	.0071 (.0059—.0083)
.6299	16.0	**3DC,5DC,8DC**	425 (330—490)	.0110 (.0091—.0130)	195 (150—230)	.0075 (.0055—.0094)
.7874	20.0	**3DC,5DC,8DC**	425 (330—490)	.0118 (.0102—.0134)	195 (150—230)	.0083 (.0059—.0102)

(Note) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MVE/MVS

RECOMMENDED CUTTING CONDITIONS

MVS

Work Material			Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-60-8 etc.	
Drill Dia. **DC** inch	Drill Dia. **DC** mm	**L/D**	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
.0394	1.0	**2,7DC**	165 (130—195)	.0016 (.0008—.0020)	130 (100—150)	.0016 (.0008—.0020)
		≥12DC	130 (100—150)	.0008 (.0004—.0012)	100 (65—115)	.0008 (.0004—.0012)
.0591	1.5	**2,7DC**	165 (130—195)	.0020 (.0012—.0031)	130 (100—150)	.0020 (.0012—.0031)
		≥12DC	130 (100—150)	.0020 (.0012—.0031)	100 (65—115)	.0020 (.0008—.0031)
.0787	2.0	**2,7DC**	165 (130—195)	.0028 (.0016—.0039)	130 (100—150)	.0028 (.0016—.0039)
		≥12DC	165 (130—195)	.0028 (.0016—.0039)	165 (130—195)	.0028 (.0016—.0039)
.0984	2.5	**2,7DC**	195 (150—230)	.0035 (.0020—.0051)	165 (130—195)	.0035 (.0020—.0051)
		≥12DC	165 (130—195)	.0035 (.0024—.0051)	165 (130—195)	.0031 (.0020—.0047)
.1260	3.2	**3DC,5DC,8DC**	295 (230—345)	.0039 (.0024—.0051)	215 (165—245)	.0039 (.0024—.0051)
.1575	4.0	**3DC,5DC,8DC**	330 (260—375)	.0047 (.0031—.0063)	215 (165—245)	.0047 (.0031—.0063)
.1969	5.0	**3DC,5DC,8DC**	330 (260—375)	.0059 (.0039—.0079)	215 (165—245)	.0059 (.0039—.0079)
.2480	6.3	**3DC,5DC,8DC**	360 (280—410)	.0079 (.0051—.0102)	230 (180—260)	.0079 (.0051—.0102)
.3150	8.0	**3DC,5DC,8DC**	395 (310—445)	.0098 (.0071—.0122)	230 (180—260)	.0091 (.0071—.0110)
.3937	10.0	**3DC,5DC,8DC**	425 (330—490)	.0114 (.0087—.0138)	230 (180—260)	.0106 (.0087—.0126)
.4724	12.0	**3DC,5DC,8DC**	460 (360—525)	.0126 (.0102—.0146)	295 (230—345)	.0118 (.0102—.0134)
.6299	16.0	**3DC,5DC,8DC**	525 (410—590)	.0138 (.0110—.0165)	295 (230—345)	.0130 (.0110—.0150)
.7874	20.0	**3DC,5DC,8DC**	525 (410—590)	.0146 (.0118—.0173)	330 (260—375)	.0138 (.0118—.0157)

Work Material			Aluminium Alloy (Si<5%) ASTM 6061, 7075 etc.		Heat Resistant Alloy Inconel718 etc.	
Drill Dia. **DC** inch	Drill Dia. **DC** mm	**L/D**	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
.0394	1.0	**2,7DC**	195 (150—230)	.0020 (.0012—.0031)	35 (15—50)	.0008 (.0004—.0012)
		≥12DC	165 (130—195)	.0020 (.0012—.0031)	35 (15—50)	.0008 (.0004—.0012)
.0591	1.5	**2,7DC**	260 (195—295)	.0028 (.0020—.0047)	35 (15—50)	.0012 (.0008—.0016)
		≥12DC	230 (180—260)	.0031 (.0020—.0047)	35 (15—50)	.0012 (.0008—.0016)
.0787	2.0	**2,7DC**	295 (230—345)	.0039 (.0024—.0059)	50 (35—65)	.0016 (.0012—.0020)
		≥12DC	260 (195—295)	.0043 (.0024—.0059)	50 (35—65)	.0016 (.0012—.0020)
.0984	2.5	**2,7DC**	330 (260—375)	.0051 (.0031—.0079)	50 (35—65)	.0020 (.0016—.0024)
		≥12DC	295 (230—345)	.0055 (.0031—.0079)	50 (35—65)	.0020 (.0016—.0024)
.1260	3.2	**3DC,5DC,8DC**	395 (310—460)	.0091 (.0039—.0138)	65 (50—80)	.0028 (.0020—.0035)
.1575	4.0	**3DC,5DC,8DC**	395 (310—460)	.0094 (.0047—.0138)	65 (50—80)	.0035 (.0024—.0043)
.1969	5.0	**3DC,5DC,8DC**	395 (310—460)	.0098 (.0059—.0138)	65 (50—80)	.0043 (.0031—.0055)
.2480	6.3	**3DC,5DC,8DC**	490 (395—560)	.0138 (.0079—.0197)	80 (65—100)	.0051 (.0035—.0063)
.3150	8.0	**3DC,5DC,8DC**	490 (395—560)	.0138 (.0079—.0197)	80 (65—100)	.0055 (.0043—.0067)
.3937	10.0	**3DC,5DC,8DC**	490 (395—560)	.0197 (.0079—.0315)	80 (65—100)	.0059 (.0047—.0067)
.4724	12.0	**3DC,5DC,8DC**	525 (410—590)	.0197 (.0079—.0315)	80 (65—100)	.0063 (.0051—.0071)
.6299	16.0	**3DC,5DC,8DC**	525 (410—590)	.0236 (.0079—.0394)	80 (65—100)	.0071 (.0055—.0083)
.7874	20.0	**3DC,5DC,8DC**	560 (445—655)	.0236 (.0079—.0394)	100 (65—115)	.0075 (.0059—.0087)

(Note) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

Memo

MWE/MWS

P M K N S H

only MWE

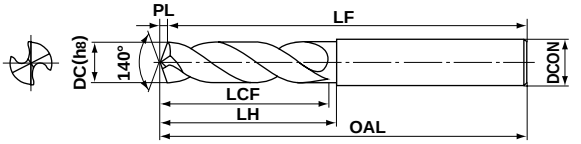
MWE (External coolant)

Tolerance		DC=3	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤25
DC (mm)		0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
DCON (mm)	MWE-5A/MA	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
	MWE-5B/MB	0 −0.006	0 −0.008	0 −0.009	0 −0.011	0 −0.013

Tolerance		DC=.1181	.1181<DC≤.2	.2362<DC≤.3	.3937<DC≤.7	.7087<DC≤.9843
DC (inch)		0 − .00055	0 − .00071	0 − .00087	0 − .00106	0 − .00130
DCON (inch)	MWE-5A/MA	0 − .00055	0 − .00071	0 − .00087	0 − .00106	0 − .00130
	MWE-5B/MB	0 − .00024	0 − .00031	0 − .00035	0 − .00043	0 − .00051



Type 1



MWS (Internal coolant)

Tolerance	0.5≤DC<1	1≤DC<2.95
DC (mm)	0 +0.009	0 +0.014
DCON (mm)	0 −0.006	0 −0.006

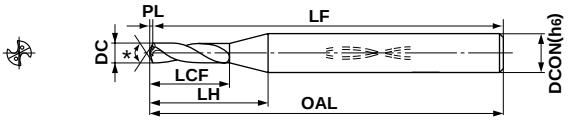
Tolerance	.0197≤DC<.03	.0304≤DC<.1161
DC (inch)	0 + .00035	0 + .00055
DCON (inch)	0 − .00024	0 − .00024

SB Type

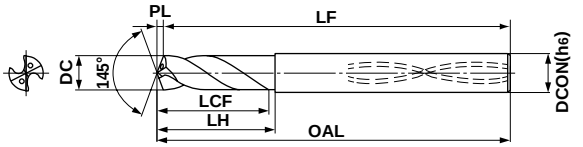




Type 2



Type 3



Tolerance	0.5≤DC<1	1≤DC<2.95
DC (mm)	0 −0.009	0 −0.014
DCON (mm)	0 −0.006	0 −0.006

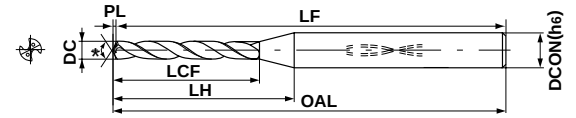
Tolerance	.0197≤DC<.03	.0304≤DC<.1161
DC (inch)	0 + .00035	0 + .00055
DCON (inch)	0 − .00024	0 − .00024

LB/XB Type (ϕ.0200"−ϕ.1200" & ϕ0.50−ϕ2.95mm)





Type 4

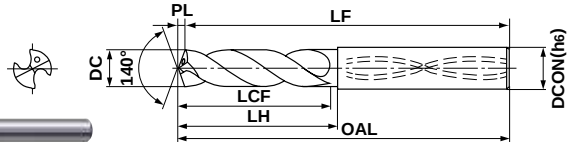


DB Type (ϕ.0200"−ϕ.1200" & ϕ0.50−ϕ2.95mm)





Type 5



* Point Angle:Type1 140° for drill diameter ϕ0.50-2.0 and 145° for ϕ2.05-2.95.
Type3 135° for drill diameter ϕ0.50-2.0 and 140° for ϕ2.05-2.95.

DRILLING

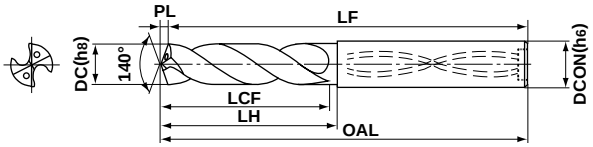
MB/LB/X8DB Type (ϕ.1250"–ϕ.7812" & ϕ3–ϕ25mm)

Tolerance	DC=3	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤25
DC (mm)	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
DCON (mm)	0 −0.006	0 −0.008	0 −0.009	0 −0.011	0 −0.013

Tolerance	DC=.1181	.1181<DC≤.2	.2362<DC≤.3	.3937<DC≤.7	.7087<DC≤.9843
DC (inch)	0 − .00055	0 − .00071	0 − .00087	0 − .00106	0 − .00130
DCON (inch)	0 − .00024	0 − .00031	0 − .00035	0 − .00043	0 − .00051



Type 6



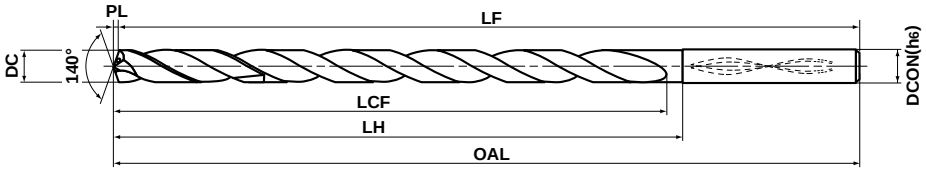
X10DB/X15DB/X20DB/X25DB/X30DB Type (ϕ.1250"–ϕ.5000" & ϕ3–ϕ14mm)

Tolerance	DC=3	3<DC≤6	6<DC≤10	10<DC≤14
DC (mm)	−0.017 −0.031	−0.025 −0.043	−0.033 −0.055	−0.041 −0.068
DCON (mm)	0 −0.006	0 −0.008	0 −0.009	0 −0.011

Tolerance	DC=.1181	.1181<DC≤.2	.2362<DC≤.3	.3937<DC≤.5512
DC (inch)	− .00067 − .00122	− .00098 − .00169	− .00130 − .00217	− .00161 − .00268
DCON (inch)	0 − .00024	0 − .00031	0 − .00035	0 − .00043



Type 7



DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.50	.0197				1	Int.	★	MWS0050SB	2.59	.102	7.29	.287	47.09	1.854	47	1.850	0.09	.004	3.0	.118	2
					5	Int.	★	MWS0050LB	8.10	.319	13.10	.516	47.10	1.854	47	1.850	0.10	.004	3.0	.118	4
					12	Int.	★	MWS0050XB	16.10	.634	21.10	.831	47.10	1.854	47	1.850	0.10	.004	3.0	.118	4
0.508	.0200		76		1	Int.	●	MWS00200SB	2.59	.102	7.59	.299	45.09	1.775	45	1.772	0.09	.004	3.175	.125	2
					5	Int.	●	MWS00200LB	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.175	.125	4
					12	Int.	●	MWS00200XB	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.175	.125	4
0.51	.0201				1	Int.	★	MWS0051SB	2.69	.106	7.29	.287	47.09	1.854	47	1.850	0.09	.004	3.0	.118	2
					5	Int.	★	MWS0051LB	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.0	.118	4
					12	Int.	★	MWS0051XB	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.0	.118	4
0.52	.0205				1	Int.	●	MWS0052SB	2.69	.106	7.29	.287	47.09	1.854	47	1.850	0.09	.004	3.0	.118	2
					5	Int.	★	MWS0052LB	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.0	.118	4
					12	Int.	●	MWS0052XB	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.0	.118	4
0.53	.0209				1	Int.	★	MWS0053SB	2.70	.106	7.30	.287	47.1	1.854	47	1.850	0.10	.004	3.0	.118	2
					5	Int.	★	MWS0053LB	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.0	.118	4
					12	Int.	★	MWS0053XB	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.0	.118	4
0.533	.0210		75		1	Int.	●	MWS00210SB	2.70	.106	7.60	.299	45.1	1.776	45	1.772	0.10	.004	3.175	.125	2
					5	Int.	●	MWS00210LB	8.11	.319	13.01	.512	47.11	1.855	47	1.850	0.11	.004	3.175	.125	4
					12	Int.	●	MWS00210XB	16.11	.634	21.01	.827	47.11	1.855	47	1.850	0.11	.004	3.175	.125	4
0.54	.0213				1	Int.	★	MWS0054SB	2.70	.106	7.30	.287	47.1	1.854	47	1.850	0.10	.004	3.0	.118	2
					5	Int.	★	MWS0054LB	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.0	.118	4
					12	Int.	★	MWS0054XB	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.0	.118	4
0.55	.0217				1	Int.	●	MWS0055SB	2.70	.106	7.30	.287	47.10	1.854	47	1.850	0.10	.004	3.0	.118	2
					5	Int.	★	MWS0055LB	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.0	.118	4
					12	Int.	●	MWS0055XB	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.0	.118	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained.
★ : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ L088
HOW TO USE ➤ L094
TECHNICAL DATA ➤ N001

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.56	.0220				1	Int.	●	MWS0056SB	3.00	.118	7.60	.299	47.10	1.854	47	1.850	0.10	.004	3.0	.118	2
					5	Int.	★	MWS0056LB	8.12	.320	13.12	.517	47.12	1.855	47	1.850	0.12	.005	3.0	.118	4
					12	Int.	●	MWS0056XB	16.12	.635	21.12	.831	47.12	1.855	47	1.850	0.12	.005	3.0	.118	4
0.57	.0224				1	Int.	●	MWS0057SB	3.00	.118	7.50	.295	47.10	1.854	47	1.850	0.10	.004	3.0	.118	2
					5	Int.	★	MWS0057LB	8.12	.320	13.12	.517	47.12	1.855	47	1.850	0.12	.005	3.0	.118	4
					12	Int.	●	MWS0057XB	16.12	.635	21.12	.831	47.12	1.855	47	1.850	0.12	.005	3.0	.118	4
0.572	.0225		74		1	Int.	●	MWS00225SB	3.00	.118	7.90	.311	45.10	1.776	45	1.772	0.10	.004	3.175	.125	2
					5	Int.	●	MWS00225LB	8.12	.320	13.02	.513	47.12	1.855	47	1.850	0.12	.005	3.175	.125	4
					12	Int.	●	MWS00225XB	16.12	.635	21.02	.828	47.12	1.855	47	1.850	0.12	.005	3.175	.125	4
0.58	.0228				1	Int.	★	MWS0058SB	3.01	.119	7.51	.296	47.11	1.855	47	1.850	0.11	.004	3.0	.118	2
					5	Int.	★	MWS0058LB	8.12	.320	13.12	.517	47.12	1.855	47	1.850	0.12	.005	3.0	.118	4
					12	Int.	★	MWS0058XB	16.12	.635	21.12	.831	47.12	1.855	47	1.850	0.12	.005	3.0	.118	4
0.59	.0232				1	Int.	★	MWS0059SB	3.01	.119	7.51	.296	47.11	1.855	47	1.850	0.11	.004	3.0	.118	2
					5	Int.	★	MWS0059LB	8.12	.320	12.12	.477	47.12	1.855	47	1.850	0.12	.005	3.0	.118	4
					12	Int.	★	MWS0059XB	16.12	.635	20.12	.792	47.12	1.855	47	1.850	0.12	.005	3.0	.118	4
0.60	.0236				1	Int.	●	MWS0060SB	3.01	.119	7.51	.296	47.11	1.855	47	1.850	0.11	.004	3.0	.118	2
					5	Int.	★	MWS0060LB	8.12	.320	12.12	.477	47.12	1.855	47	1.850	0.12	.005	3.0	.118	4
					12	Int.	●	MWS0060XB	16.12	.635	20.12	.792	47.12	1.855	47	1.850	0.12	.005	3.0	.118	4
0.610	.0240		73		1	Int.	●	MWS00240SB	3.21	.126	8.01	.315	45.11	1.776	45	1.772	0.11	.004	3.175	.125	2
					1	Int.	★	MWS0061SB	3.21	.126	7.71	.304	47.11	1.855	47	1.850	0.11	.004	3.0	.118	4
					5	Int.	●	MWS00240LB	8.13	.320	12.93	.509	47.13	1.856	47	1.850	0.13	.005	3.175	.125	4
					5	Int.	★	MWS0061LB	8.13	.320	12.13	.478	47.13	1.856	47	1.850	0.13	.005	3.0	.118	4
					12	Int.	●	MWS00240XB	16.13	.635	20.93	.824	47.13	1.856	47	1.850	0.13	.005	3.175	.125	4
					12	Int.	★	MWS0061XB	16.13	.635	20.13	.793	47.13	1.856	47	1.850	0.13	.005	3.0	.118	4
0.62	.0244				1	Int.	★	MWS0062SB	3.21	.126	7.61	.300	47.11	1.855	47	1.850	0.11	.004	3.0	.118	2
					5	Int.	★	MWS0062LB	8.13	.320	12.13	.478	47.13	1.856	47	1.850	0.13	.005	3.0	.118	4
					12	Int.	★	MWS0062XB	16.13	.635	20.13	.793	47.13	1.856	47	1.850	0.13	.005	3.0	.118	4
0.63	.0248				1	Int.	★	MWS0063SB	3.21	.126	7.61	.300	47.11	1.855	47	1.850	0.11	.004	3.0	.118	2
					5	Int.	★	MWS0063LB	8.13	.320	12.13	.478	47.13	1.856	47	1.850	0.13	.005	3.0	.118	4
					12	Int.	★	MWS0063XB	16.13	.635	20.13	.793	47.13	1.856	47	1.850	0.13	.005	3.0	.118	4
0.635	.0250		72		1	Int.	●	MWS00250SB	3.22	.127	7.92	.312	45.12	1.776	45	1.772	0.12	.005	3.175	.125	2
					5	Int.	●	MWS00250LB	8.13	.320	12.83	.505	47.13	1.856	47	1.850	0.13	.005	3.175	.125	4
					12	Int.	●	MWS00250XB	16.13	.635	20.83	.820	47.13	1.856	47	1.850	0.13	.005	3.175	.125	4
0.64	.0252				1	Int.	★	MWS0064SB	3.22	.127	7.62	.300	47.12	1.855	47	1.850	0.12	.005	3.0	.118	2
					5	Int.	★	MWS0064LB	8.13	.320	12.13	.478	47.13	1.856	47	1.850	0.13	.005	3.0	.118	4
					12	Int.	★	MWS0064XB	16.13	.635	20.13	.793	47.13	1.856	47	1.850	0.13	.005	3.0	.118	4
0.65	.0256				1	Int.	●	MWS0065SB	3.22	.127	7.62	.300	47.12	1.855	47	1.850	0.12	.005	3.0	.118	2
					5	Int.	★	MWS0065LB	8.13	.320	12.13	.478	47.13	1.856	47	1.850	0.13	.005	3.0	.118	4
					12	Int.	●	MWS0065XB	16.13	.635	20.13	.793	47.13	1.856	47	1.850	0.13	.005	3.0	.118	4
0.660	.0260		71		1	Int.	●	MWS00260SB	3.52	.139	8.22	.324	45.12	1.776	45	1.772	0.12	.005	3.175	.125	2
					1	Int.	●	MWS0066SB	3.52	.139	7.92	.312	47.12	1.855	47	1.850	0.12	.005	3.0	.118	2
					5	Int.	●	MWS00260LB	8.14	.320	12.84	.506	47.14	1.856	47	1.850	0.14	.006	3.175	.125	4
					5	Int.	●	MWS0066LB	8.14	.320	12.14	.478	47.14	1.856	47	1.850	0.14	.006	3.0	.118	4
					12	Int.	●	MWS00260XB	16.14	.635	20.84	.820	47.14	1.856	47	1.850	0.14	.006	3.175	.125	4
					12	Int.	★	MWS0066XB	16.14	.635	20.14	.793	47.14	1.856	47	1.850	0.14	.006	3.0	.118	4
0.67	.0264				1	Int.	★	MWS0067SB	3.52	.139	7.82	.308	47.12	1.855	47	1.850	0.12	.005	3.0	.118	2
					5	Int.	★	MWS0067LB	8.14	.320	12.14	.478	47.14	1.856	47	1.850	0.14	.006	3.0	.118	4
					12	Int.	★	MWS0067XB	16.14	.635	20.14	.793	47.14	1.856	47	1.850	0.14	.006	3.0	.118	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.68	**.0268**				1	Int.	★	**MWS0068SB**	3.52	.139	7.82	.308	47.12	1.855	47	1.850	0.12	.005	3.0	.118	2
					5	Int.	★	**MWS0068LB**	8.14	.320	12.14	.478	47.14	1.856	47	1.850	0.14	.006	3.0	.118	4
					12	Int.	★	**MWS0068XB**	16.14	.635	20.14	.793	47.14	1.856	47	1.850	0.14	.006	3.0	.118	4
0.69	**.0272**				1	Int.	★	**MWS0069SB**	3.53	.139	7.83	.308	47.13	1.856	47	1.850	0.13	.005	3.0	.118	2
					5	Int.	★	**MWS0069LB**	8.14	.320	12.14	.478	47.14	1.856	47	1.850	0.14	.006	3.0	.118	4
					12	Int.	★	**MWS0069XB**	16.14	.635	20.14	.793	47.14	1.856	47	1.850	0.14	.006	3.0	.118	4
0.70	**.0276**				1	Int.	●	**MWS0070SB**	3.53	.139	7.83	.308	47.13	1.856	47	1.850	0.13	.005	3.0	.118	2
					5	Int.	★	**MWS0070LB**	8.14	.320	12.14	.478	47.14	1.856	47	1.850	0.14	.006	3.0	.118	4
					12	Int.	★	**MWS0070XB**	16.14	.635	20.14	.793	47.14	1.856	47	1.850	0.14	.006	3.0	.118	4
0.71	**.0280**		**70**		1	Int.	★	**MWS0071SB**	3.73	.147	8.03	.316	50.13	1.974	50	1.969	0.13	.005	3.0	.118	2
					5	Int.	★	**MWS0071LB**	20.15	.793	14.15	.557	50.15	1.974	50	1.969	0.15	.006	3.0	.118	4
					12	Int.	★	**MWS0071XB**	20.15	.793	24.15	.951	50.15	1.974	50	1.969	0.15	.006	3.0	.118	4
0.711	**.0280**		**70**		1	Int.	●	**MWS00280SB**	3.73	.147	8.33	.328	50.13	1.974	50	1.969	0.13	.005	3.175	.125	2
					5	Int.	●	**MWS00280LB**	10.15	.400	14.75	.581	50.15	1.974	50	1.969	0.15	.006	3.175	.125	4
					12	Int.	●	**MWS00280XB**	20.15	.793	24.75	.974	50.15	1.974	50	1.969	0.15	.006	3.175	.125	4
0.72	**.0283**				1	Int.	★	**MWS0072SB**	3.73	.147	8.03	.316	50.13	1.974	50	1.969	0.13	.005	3.0	.118	2
					5	Int.	★	**MWS0072LB**	10.15	.400	14.15	.557	50.15	1.974	50	1.969	0.15	.006	3.0	.118	4
					12	Int.	★	**MWS0072XB**	20.15	.793	24.15	.951	50.15	1.974	50	1.969	0.15	.006	3.0	.118	4
0.73	**.0287**				1	Int.	★	**MWS0073SB**	3.73	.147	7.93	.312	50.13	1.974	50	1.969	0.13	.005	3.0	.118	2
					5	Int.	★	**MWS0073LB**	10.15	.400	14.15	.557	50.15	1.974	50	1.969	0.15	.006	3.0	.118	4
					12	Int.	★	**MWS0073XB**	20.15	.793	24.15	.951	50.15	1.974	50	1.969	0.15	.006	3.0	.118	4
0.74	**.0291**				1	Int.	★	**MWS0074SB**	3.73	.147	7.93	.312	50.13	1.974	50	1.969	0.13	.005	3.0	.118	2
					5	Int.	★	**MWS0074LB**	10.15	.400	14.15	.557	50.15	1.974	50	1.969	0.15	.006	3.0	.118	4
					12	Int.	★	**MWS0074XB**	20.15	.793	24.15	.951	50.15	1.974	50	1.969	0.15	.006	3.0	.118	4
0.742	**.0292**		**69**		1	Int.	●	**MWS00292SB**	3.74	.147	8.24	.324	50.14	1.974	50	1.969	0.14	.006	3.175	.125	2
					5	Int.	●	**MWS00292LB**	10.15	.400	14.65	.577	50.15	1.974	50	1.969	0.15	.006	3.175	.125	4
					12	Int.	●	**MWS00292XB**	20.15	.793	24.65	.970	50.15	1.974	50	1.969	0.15	.006	3.175	.125	4
0.75	**.0295**				1	Int.	●	**MWS0075SB**	3.74	.147	7.94	.313	50.14	1.974	50	1.969	0.14	.006	3.0	.118	2
					5	Int.	●	**MWS0075LB**	10.16	.400	14.16	.557	50.16	1.975	50	1.969	0.16	.006	3.0	.118	4
					12	Int.	●	**MWS0075XB**	20.16	.794	24.16	.951	50.16	1.975	50	1.969	0.16	.006	3.0	.118	4
0.76	**.0299**				1	Int.	●	**MWS0076SB**	4.04	.159	8.24	.324	50.14	1.974	50	1.969	0.14	.006	3.0	.118	2
					5	Int.	●	**MWS0076LB**	10.16	.400	14.16	.557	50.16	1.975	50	1.969	0.16	.006	3.0	.118	4
					12	Int.	●	**MWS0076XB**	20.16	.794	24.16	.951	50.16	1.975	50	1.969	0.16	.006	3.0	.118	4
0.77	**.0303**				1	Int.	★	**MWS0077SB**	4.04	.159	8.24	.324	50.14	1.974	50	1.969	0.14	.006	3.0	.118	2
					5	Int.	★	**MWS0077LB**	10.16	.400	14.16	.557	50.16	1.975	50	1.969	0.16	.006	3.0	.118	4
					12	Int.	★	**MWS0077XB**	20.16	.794	24.16	.951	50.16	1.975	50	1.969	0.16	.006	3.0	.118	4
0.78	**.0307**				1	Int.	●	**MWS0078SB**	4.04	.159	8.14	.320	50.14	1.974	50	1.969	0.14	.006	3.0	.118	2
					5	Int.	★	**MWS0078LB**	10.16	.400	14.16	.557	50.16	1.975	50	1.969	0.16	.006	3.0	.118	4
					12	Int.	●	**MWS0078XB**	20.16	.794	24.16	.951	50.16	1.975	50	1.969	0.16	.006	3.0	.118	4
0.787	**.0310**		**68**		1	Int.	●	**MWS00310SB**	4.04	.159	8.54	.336	50.14	1.974	50	1.969	0.14	.006	3.175	.125	2
					5	Int.	●	**MWS00310LB**	10.16	.400	14.66	.577	50.16	1.975	50	1.969	0.16	.006	3.175	.125	4
					12	Int.	●	**MWS00310XB**	20.16	.794	24.66	.971	50.16	1.975	50	1.969	0.16	.006	3.175	.125	4
0.79	**.0311**				1	Int.	★	**MWS0079SB**	4.04	.159	8.14	.320	50.14	1.974	50	1.969	0.14	.006	3.0	.118	2
					5	Int.	★	**MWS0079LB**	10.16	.400	14.16	.557	50.16	1.975	50	1.969	0.16	.006	3.0	.118	4
					12	Int.	★	**MWS0079XB**	20.16	.794	24.16	.951	50.16	1.975	50	1.969	0.16	.006	3.0	.118	4
0.792	**.0312**	**1/32**			1	Int.	●	**MWS00312SB**	4.04	.159	8.44	.332	50.14	1.974	50	1.969	0.14	.006	3.175	.125	2
					5	Int.	●	**MWS00312LB**	10.16	.400	14.56	.573	50.16	1.975	50	1.969	0.16	.006	3.175	.125	4
					12	Int.	●	**MWS00312XB**	20.16	.794	24.56	.967	50.16	1.975	50	1.969	0.16	.006	3.175	.125	4

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.80	.0315				1	Int.	●	MWS0080SB	4.05	.159	8.15	.321	50.15	1.974	50	1.969	0.15	.006	3.0	.118	2
					5	Int.	●	MWS0080LB	10.17	.400	14.17	.558	50.17	1.975	50	1.969	0.17	.007	3.0	.118	4
					12	Int.	●	MWS0080XB	20.17	.794	24.17	.952	50.17	1.975	50	1.969	0.17	.007	3.0	.118	4
0.81	.0319				1	Int.	★	MWS0081SB	4.25	.167	8.35	.329	50.15	1.974	50	1.969	0.15	.006	3.0	.118	2
					5	Int.	★	MWS0081LB	10.17	.400	14.17	.558	50.17	1.975	50	1.969	0.17	.007	3.0	.118	4
					12	Int.	★	MWS0081XB	20.17	.794	24.17	.952	50.17	1.975	50	1.969	0.17	.007	3.0	.118	4
0.813	.0320		67		1	Int.	●	MWS00320SB	4.25	.167	8.65	.341	50.15	1.974	50	1.969	0.15	.006	3.175	.125	2
					5	Int.	●	MWS00320LB	10.17	.400	14.57	.574	50.17	1.975	50	1.969	0.17	.007	3.175	.125	4
					12	Int.	●	MWS00320XB	20.17	.794	24.57	.967	50.17	1.975	50	1.969	0.17	.007	3.175	.125	4
0.82	.0323				1	Int.	●	MWS0082SB	4.25	.167	8.35	.329	50.15	1.974	50	1.969	0.15	.006	3.0	.118	2
					5	Int.	●	MWS0082LB	10.17	.400	14.17	.558	50.17	1.975	50	1.969	0.17	.007	3.0.	.118	4
					12	Int.	★	MWS0082XB	20.17	.794	24.17	.952	50.17	1.975	50	1.969	0.17	.007	3.0	.118	4
0.83	.0327				1	Int.	●	MWS0083SB	4.25	.167	8.25	.325	50.15	1.974	50	1.969	0.15	.006	3.0	.118	2
					5	Int.	●	MWS0083LB	10.17	.400	14.17	.558	50.17	1.975	50	1.969	0.17	.007	3.0	.118	4
					12	Int.	★	MWS0083XB	20.17	.794	24.17	.952	50.17	1.975	50	1.969	0.17	.007	3.0	.118	4
0.838	.0330		66		1	Int.	●	MWS00330SB	4.25	.167	8.65	.341	50.15	1.974	50	1.969	0.15	.006	3.175	.125	2
					5	Int.	●	MWS00330LB	10.17	.400	14.57	.574	50.17	1.975	50	1.969	0.17	.007	3.175	.125	4
					12	Int.	●	MWS00330XB	20.17	.794	24.57	.967	50.17	1.975	50	1.969	0.17	.007	3.175	.125	4
0.84	.0331				1	Int.	★	MWS0084SB	4.25	.167	8.25	.325	50.15	1.974	50	1.969	0.15	.006	3.0	.118	2
					5	Int.	★	MWS0084LB	10.17	.400	14.17	.558	50.17	1.975	50	1.969	0.17	.007	3.0	.118	4
					12	Int.	★	MWS0084XB	20.17	.794	24.17	.952	50.17	1.975	50	1.969	0.17	.007	3.0	.118	4
0.85	.0335				1	Int.	●	MWS0085SB	4.25	.167	8.25	.325	50.15	1.974	50	1.969	0.15	.006	3.0	.118	2
					5	Int.	●	MWS0085LB	10.18	.401	14.18	.558	50.18	1.976	50	1.969	0.18	.007	3.0	.118	4
					12	Int.	★	MWS0085XB	20.18	.794	24.18	.952	50.18	1.976	50	1.969	0.18	.007	3.0	.118	4
0.86	.0339				1	Int.	●	MWS0086SB	4.56	.180	8.56	.337	50.16	1.975	50	1.969	0.16	.006	3.0	.118	2
					5	Int.	★	MWS0086LB	10.18	.401	14.18	.558	50.18	1.976	50	1.969	0.18	.007	3.0	.118	4
					12	Int.	★	MWS0086XB	20.18	.794	24.18	.952	50.18	1.976	50	1.969	0.18	.007	3.0	.118	4
0.87	.0343				1	Int.	★	MWS0087SB	4.56	.180	8.56	.337	50.16	1.975	50	1.969	0.16	.006	3.0	.118	2
					5	Int.	★	MWS0087LB	10.18	.401	14.18	.558	50.18	1.976	50	1.969	0.18	.007	3.0	.118	4
					12	Int.	★	MWS0087XB	20.18	.794	24.18	.952	50.18	1.976	50	1.969	0.18	.007	3.0	.118	4
0.88	.0346				1	Int.	★	MWS0088SB	4.56	.180	8.56	.337	50.16	1.975	50	1.969	0.16	.006	3.0	.118	2
					5	Int.	★	MWS0088LB	10.18	.401	14.18	.558	50.18	1.976	50	1.969	0.18	.007	3.0	.118	4
					12	Int.	★	MWS0088XB	20.18	.794	24.18	.952	50.18	1.976	50	1.969	0.18	.007	3.0	.118	4
0.889	.0350		65		1	Int.	●	MWS00350SB	4.56	.180	8.86	.349	50.16	1.975	50	1.969	0.16	.006	3.175	.125	2
					5	Int.	●	MWS00350LB	10.18	.401	14.48	.570	50.18	1.976	50	1.969	0.18	.007	3.175	.125	4
					12	Int.	●	MWS00350XB	20.18	.794	24.48	.964	50.18	1.976	50	1.969	0.18	.007	3.175	.125	4
0.89	.0350		65		1	Int.	★	MWS0089SB	4.56	.180	8.46	.333	50.16	1.975	50	1.969	0.16	.006	3.0	.118	2
					5	Int.	★	MWS0089LB	10.18	.401	14.18	.558	50.18	1.976	50	1.969	0.18	.007	3.0	.118	4
					12	Int.	★	MWS0089XB	20.18	.794	24.18	.952	50.18	1.976	50	1.969	0.18	.007	3.0	.118	4
0.90	.0354				1	Int.	●	MWS0090SB	4.56	.180	8.46	.333	50.16	1.975	50	1.969	0.16	.006	3.0	.118	2
					5	Int.	●	MWS0090LB	10.19	.401	14.19	.559	50.19	1.976	50	1.969	0.19	.007	3.0	.118	4
					12	Int.	★	MWS0090XB	20.19	.795	24.19	.952	50.19	1.976	50	1.969	0.19	.007	3.0	.118	4
0.91	.0358				1	Int.	★	MWS0091SB	4.77	.188	8.67	.341	50.17	1.975	50	1.969	0.17	.007	3.0	.118	2
					5	Int.	★	MWS0091LB	10.19	.401	14.19	.559	50.19	1.976	50	1.969	0.19	.007	3.0	.118	4
					12	Int.	★	MWS0091XB	20.19	.795	24.19	.952	50.19	1.976	50	1.969	0.19	.007	3.0	.118	4
0.914	.0360		64		1	Int.	●	MWS00360SB	4.77	.188	8.97	.353	50.17	1.975	50	1.969	0.17	.007	3.175	.125	2
					5	Int.	●	MWS00360LB	10.19	.401	14.39	.567	50.19	1.976	50	1.969	0.19	.007	3.175	.125	4
					12	Int.	●	MWS00360XB	20.19	.795	24.39	.960	50.19	1.976	50	1.969	0.19	.007	3.175	.125	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.92	.0362				1	Int.	★	MWS0092SB	4.77	.188	8.67	.341	50.17	1.975	50	1.969	0.17	.007	3.0	.118	2
					5	Int.	★	MWS0092LB	10.19	.401	14.19	.559	50.19	1.976	50	1.969	0.19	.007	3.0	.118	4
					12	Int.	★	MWS0092XB	20.19	.795	24.19	.952	50.19	1.976	50	1.969	0.19	.007	3.0	.118	4
0.93	.0366				1	Int.	●	MWS0093SB	4.77	.188	8.67	.341	50.17	1.975	50	1.969	0.17	.007	3.0	.118	2
					5	Int.	●	MWS0093LB	10.19	.401	14.19	.559	50.19	1.976	50	1.969	0.19	.007	3.0	.118	4
					12	Int.	★	MWS0093XB	20.19	.795	24.19	.952	50.19	1.976	50	1.969	0.19	.007	3.0	.118	4
0.940	.0370		63		1	Int.	●	MWS00370SB	4.77	.188	8.97	.353	50.17	1.975	50	1.969	0.17	.007	3.175	.125	2
					1	Int.	★	MWS0094SB	4.77	.188	8.57	.337	50.17	1.975	50	1.969	0.17	.007	3.0	.118	2
					5	Int.	●	MWS00370LB	10.19	.401	14.39	.567	50.19	1.976	50	1.969	0.19	.007	3.175	.125	4
					5	Int.	★	MWS0094LB	10.19	.401	14.19	.559	50.19	1.976	50	1.969	0.19	.007	3.0	.118	4
					12	Int.	●	MWS00370XB	20.19	.795	24.39	.960	50.19	1.976	50	1.969	0.19	.007	3.175	.125	4
					12	Int.	★	MWS0094XB	20.19	.795	24.19	.952	50.19	1.976	50	1.969	0.19	.007	3.0	.118	4
0.95	.0374				1	Int.	★	MWS0095SB	4.77	.188	8.57	.337	50.17	1.975	50	1.969	0.17	.007	3.0	.118	2
					5	Int.	★	MWS0095LB	10.20	.402	14.20	.559	50.20	1.976	50	1.969	0.20	.008	3.0	.118	4
					12	Int.	★	MWS0095XB	20.20	.795	24.20	.953	50.20	1.976	50	1.969	0.20	.008	3.0	.118	4
0.96	.0378				1	Int.	★	MWS0096SB	5.07	.200	8.87	.349	50.17	1.975	50	1.969	0.17	.007	3.0	.118	2
					5	Int.	★	MWS0096LB	10.20	.402	14.20	.559	50.20	1.976	50	1.969	0.20	.008	3.0	.118	4
					12	Int.	★	MWS0096XB	20.20	.795	24.20	.953	50.20	1.976	50	1.969	0.20	.008	3.0	.118	4
0.965	.0380		62		1	Int.	●	MWS00380SB	5.08	.200	9.18	.361	50.18	1.976	50	1.969	0.18	.007	3.175	.125	2
					5	Int.	●	MWS00380LB	10.20	.402	14.30	.563	50.20	1.976	50	1.969	0.20	.008	3.175	.125	4
					12	Int.	●	MWS00380XB	20.20	.795	24.30	.957	50.20	1.976	50	1.969	0.20	.008	3.175	.125	4
0.97	.0382				1	Int.	●	MWS0097SB	5.08	.200	8.88	.350	50.18	1.976	50	1.969	0.18	.007	3.0	.118	2
					5	Int.	●	MWS0097LB	10.20	.402	14.20	.559	50.20	1.976	50	1.969	0.20	.008	3.0	.118	4
					12	Int.	★	MWS0097XB	20.20	.795	24.20	.953	50.20	1.976	50	1.969	0.20	.008	3.0	.118	4
0.980	.0386				1	Int.	★	MWS0098SB	5.08	.200	8.88	.350	50.18	1.976	50	1.969	0.18	.007	3.0	.118	2
					5	Int.	★	MWS0098LB	10.20	.402	14.20	.559	50.20	1.976	50	1.969	0.20	.008	3.0	.118	4
					12	Int.	★	MWS0098XB	20.20	.795	24.20	.953	50.20	1.976	50	1.969	0.20	.008	3.0	.118	4
0.990	.0390		61		1	Int.	●	MWS0099SB	5.08	.200	8.88	.350	50.18	1.976	50	1.969	0.18	.007	3.0	.118	2
					5	Int.	★	MWS0099LB	10.21	.402	14.21	.559	50.21	1.977	50	1.969	0.21	.008	3.0	.118	4
					12	Int.	★	MWS0099XB	20.21	.796	24.21	.953	50.21	1.977	50	1.969	0.21	.008	3.0	.118	4
0.991	.0390		61		1	Int.	●	MWS00390SB	5.08	.200	9.18	.361	50.18	1.976	50	1.969	0.18	.007	3.175	.125	2
					5	Int.	●	MWS00390LB	10.21	.402	14.31	.563	50.21	1.977	50	1.969	0.21	.008	3.175	.125	4
					12	Int.	●	MWS00390XB	20.21	.796	24.31	.957	50.21	1.977	50	1.969	0.21	.008	3.175	.125	4
1.000	.0394				1	Int.	●	MWS0100SB	5.20	.205	8.9	.350	55.2	2.173	55	2.165	0.2	.008	3.0	.118	2
					5	Int.	●	MWS0100LB	11.20	.441	15.2	.598	55.2	2.173	55	2.165	0.2	.008	3.0	.118	4
					12	Int.	●	MWS0100XB	23.20	.913	27.2	1.071	55.2	2.173	55	2.165	0.2	.008	3.0	.118	4
					20	Int.	●	MWS0100X20DB	24.20	.953	28.2	1.110	60.2	2.370	60	2.362	0.2	.008	3.0	.118	4
					25	Int.	●	MWS0100X25DB	28.20	1.110	32.2	1.268	66.2	2.606	66	2.598	0.2	.008	3.0	.118	4
					30	Int.	●	MWS0100X30DB	33.20	1.307	37.2	1.465	72.2	2.843	72	2.835	0.2	.008	3.0	.118	4
1.001	.0394				1	Int.	●	MWS00394SB	5.20	.205	9.3	.366	55.2	2.173	55	2.165	0.2	.008	3.175	.125	2
					12	Int.	●	MWS00394XB	23.20	.913	27.3	1.075	55.2	2.173	55	2.165	0.2	.008	3.175	.125	4
1.016	.0400		60		1	Int.	●	MWS00400SB	5.20	.205	9.2	.362	55.2	2.173	55	2.165	0.2	.008	3.175	.125	2
					12	Int.	●	MWS00400XB	23.20	.913	27.2	1.071	55.2	2.173	55	2.165	0.2	.008	3.175	.125	4
1.041	.0410		59		1	Int.	●	MWS00410SB	5.40	.213	9.4	.370	55.2	2.173	55	2.165	0.2	.008	3.175	.125	2
					12	Int.	●	MWS00410XB	23.20	.913	27.2	1.071	55.2	2.173	55	2.165	0.2	.008	3.175	.125	4

CUTTING CONDITIONS ➤ L088
HOW TO USE ➤ L094
TECHNICAL DATA ➤ N001

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
1.050	.0413				1	Int.	●	MWS0105SB	5.4	.213	9.0	.354	55.2	2.173	55	2.165	0.2	.008	3.0	.118	2
					20	Int.	□	MWS0105X20DB	24.2	.953	28.2	1.110	60.2	2.370	60	2.362	0.2	.008	3.0	.118	4
					25	Int.	●	MWS0105X25DB	29.2	1.150	33.2	1.307	66.2	2.606	66	2.598	0.2	.008	3.0	.118	4
					30	Int.	□	MWS0105X30DB	35.2	1.386	38.2	1.504	72.2	2.843	72	2.835	0.2	.008	3.0	.118	4
1.067	.0420		58		1	Int.	●	MWS00420SB	5.4	.213	9.3	.366	55.2	2.173	55	2.165	0.2	.008	3.175	.125	2
					12	Int.	●	MWS00420XB	23.2	.913	27.1	1.067	55.2	2.173	55	2.165	0.2	.008	3.175	.125	4
1.092	.0430		57		1	Int.	●	MWS00430SB	5.6	.220	9.5	.374	55.2	2.173	55	2.165	0.2	.008	3.175	.125	2
					12	Int.	●	MWS00430XB	23.2	.913	27.1	1.067	55.2	2.173	55	2.165	0.2	.008	3.175	.125	4
1.100	.0433				1	Int.	●	MWS0110SB	5.6	.220	9.1	.358	55.2	2.173	55	2.165	0.2	.008	3.0	.118	2
					5	Int.	★	MWS0110LB	17.2	.677	21.2	.835	55.2	2.173	55	2.165	0.2	.008	3.0	.118	4
					12	Int.	●	MWS0110XB	23.2	.913	27.2	1.071	55.2	2.173	55	2.165	0.2	.008	3.0	.118	4
					20	Int.	★	MWS0110X20DB	25.2	.992	29.2	1.150	60.2	2.370	60	2.362	0.2	.008	3.0	.118	4
					25	Int.	●	MWS0110X25DB	31.2	1.228	34.2	1.346	66.2	2.606	66	2.598	0.2	.008	3.0	.118	4
					30	Int.	★	MWS0110X30DB	36.2	1.425	40.2	1.583	72.2	2.843	72	2.835	0.2	.008	3.0	.118	4
1.150	.0453				1	Int.	□	MWS0115SB	5.8	.228	9.3	.366	55.2	2.173	55	2.165	0.2	.008	3.0	.118	2
					20	Int.	□	MWS0115X20DB	26.2	1.031	30.2	1.189	60.2	2.370	60	2.362	0.2	.008	3.0	.118	4
					25	Int.	□	MWS0115X25DB	32.2	1.268	36.2	1.425	66.2	2.606	66	2.598	0.2	.008	3.0	.118	4
					30	Int.	□	MWS0115X30DB	38.2	1.504	41.2	1.622	72.2	2.843	72	2.835	0.2	.008	3.0	.118	4
1.181	.0465		56		1	Int.	●	MWS00465SB	6.2	.244	9.9	.390	55.2	2.173	55	2.165	0.2	.008	3.175	.125	2
					12	Int.	●	MWS00465XB	23.2	.913	26.9	1.059	55.2	2.173	55	2.165	0.2	.008	3.175	.125	4
1.200	.0472				1	Int.	●	MWS0120SB	6.2	.244	9.6	.378	55.2	2.173	55	2.165	0.2	.008	3.0	.118	2
					5	Int.	★	MWS0120LB	17.3	.681	20.3	.799	55.3	2.177	55	2.165	0.3	.012	3.0	.118	4
					12	Int.	●	MWS0120XB	23.3	.917	26.3	1.035	55.3	2.177	55	2.165	0.3	.012	3.0	.118	4
					20	Int.	●	MWS0120X20DB	28.2	1.110	31.2	1.228	60.2	2.370	60	2.362	0.2	.008	3.0	.118	4
					25	Int.	●	MWS0120X25DB	34.2	1.346	37.2	1.465	66.2	2.606	66	2.598	0.2	.008	3.0	.118	4
					30	Int.	●	MWS0120X30DB	40.2	1.583	43.2	1.701	72.2	2.843	72	2.835	0.2	.008	3.0	.118	4
1.250	.0492				1	Int.	●	MWS0125SB	6.4	.252	9.7	.382	55.2	2.173	55	2.165	0.2	.008	3.0	.118	2
					20	Int.	●	MWS0125X20DB	29.2	1.150	32.2	1.268	68.2	2.685	68	2.677	0.2	.008	3.0	.118	4
					25	Int.	□	MWS0125X25DB	35.2	1.386	38.2	1.504	74.2	2.921	74	2.913	0.2	.008	3.0	.118	4
					30	Int.	□	MWS0125X30DB	41.2	1.622	45.2	1.780	82.2	3.236	82	3.228	0.2	.008	3.0	.118	4
1.300	.0512				1	Int.	●	MWS0130SB	6.6	.260	9.8	.386	55.2	2.173	55	2.165	0.2	.008	3.0	.118	2
					5	Int.	★	MWS0130LB	17.3	.681	20.3	.799	55.3	2.177	55	2.165	0.3	.012	3.0	.118	4
					12	Int.	●	MWS0130XB	23.3	.917	26.3	1.035	55.3	2.177	55	2.165	0.3	.012	3.0	.118	4
					20	Int.	●	MWS0130X20DB	30.2	1.189	33.2	1.307	68.2	2.685	68	2.677	0.2	.008	3.0	.118	4
					25	Int.	●	MWS0130X25DB	36.2	1.425	40.2	1.583	74.2	2.921	74	2.913	0.2	.008	3.0	.118	4
					30	Int.	●	MWS0130X30DB	43.2	1.701	46.2	1.819	82.2	3.236	82	3.228	0.2	.008	3.0	.118	4
1.321	.0520		55		1	Int.	●	MWS00520SB	6.6	.260	10.1	.398	55.2	2.173	55	2.165	0.2	.008	3.175	.125	2
					12	Int.	●	MWS00520XB	23.3	.917	26.8	1.055	55.3	2.177	55	2.165	0.3	.012	3.175	.125	4
1.350	.0531				1	Int.	□	MWS0135SB	6.9	.272	10.0	.394	55.3	2.177	55	2.165	0.3	.012	3.0	.118	2
					20	Int.	□	MWS0135X20DB	31.3	1.232	34.3	1.350	68.3	2.689	68	2.677	0.3	.012	3.0	.118	4
					25	Int.	□	MWS0135X25DB	38.3	1.508	41.3	1.626	74.3	2.925	74	2.913	0.3	.012	3.0	.118	4
					30	Int.	□	MWS0135X30DB	45.3	1.783	48.3	1.902	82.3	3.240	82	3.228	0.3	.012	3.0	.118	4
1.397	.0550		54		1	Int.	●	MWS00550SB	7.3	.287	10.6	.417	55.3	2.177	55	2.165	0.3	.012	3.175	.125	2
					12	Int.	●	MWS00550XB	23.3	.917	26.6	1.047	55.3	2.177	55	2.165	0.3	.012	3.175	.125	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

□ : Non stock, produced to order only.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
1.400	.0551				1	Int.	●	MWS0140SB	7.3	.287	10.3	.406	55.3	2.177	55	2.165	0.3	.012	3.0	.118	2
					5	Int.	★	MWS0140LB	17.3	.681	20.3	.799	55.3	2.177	55	2.165	0.3	.012	3.0	.118	4
					12	Int.	●	MWS0140XB	23.3	.917	26.3	1.035	55.3	2.177	55	2.165	0.3	.012	3.0	.118	4
					20	Int.	●	MWS0140X20DB	32.3	1.272	35.3	1.390	68.3	2.689	68	2.677	0.3	.012	3.0	.118	4
					25	Int.	●	MWS0140X25DB	39.3	1.547	42.3	1.665	74.3	2.925	74	2.913	0.3	.012	3.0	.118	4
					30	Int.	●	MWS0140X30DB	46.3	1.823	49.3	1.941	82.3	3.240	82	3.228	0.3	.012	3.0	.118	4
1.450	.0571				1	Int.	●	MWS0145SB	7.5	.295	10.4	.409	55.3	2.177	55	2.165	0.3	.012	3.0	.118	2
					20	Int.	●	MWS0145X20DB	33.3	1.311	36.3	1.429	68.3	2.689	68	2.677	0.3	.012	3.0	.118	4
					25	Int.	□	MWS0145X25DB	41.3	1.626	43.3	1.705	74.3	2.925	74	2.913	0.3	.012	3.0	.118	4
					30	Int.	□	MWS0145X30DB	48.3	1.902	51.3	2.020	82.3	3.240	82	3.228	0.3	.012	3.0	.118	4
1.500	.0591			#1-64	1	Int.	●	MWS0150SB	7.7	.303	10.5	.413	55.3	2.177	55	2.165	0.3	.012	3.0	.118	2
					5	Int.	●	MWS0150LB	17.3	.681	20.3	.799	55.3	2.177	55	2.165	0.3	.012	3.0	.118	4
					12	Int.	●	MWS0150XB	23.3	.917	26.3	1.035	55.3	2.177	55	2.165	0.3	.012	3.0	.118	4
					20	Int.	●	MWS0150X20DB	35.3	1.390	37.3	1.469	68.3	2.689	68	2.677	0.3	.012	3.0	.118	4
					25	Int.	●	MWS0150X25DB	42.3	1.665	45.3	1.783	74.3	2.925	74	2.913	0.3	.012	3.0	.118	4
					30	Int.	●	MWS0150X30DB	50.3	1.980	52.3	2.059	82.3	3.240	82	3.228	0.3	.012	3.0	.118	4
1.501	.0591			#1-64	1	Int.	●	MWS00591SB	7.7	.303	10.8	.425	55.3	2.177	55	2.165	0.3	.012	3.175	.125	2
					12	Int.	●	MWS00591XB	23.3	.917	26.4	1.039	55.3	2.177	55	2.165	0.3	.012	3.175	.125	4
1.550	.0610				1	Int.	●	MWS0155SB	7.9	.311	10.6	.417	68.3	2.689	68	2.677	0.3	.012	3.0	.118	2
					20	Int.	●	MWS0155X20DB	36.3	1.429	38.3	1.508	78.3	3.083	78	3.071	0.3	.012	3.0	.118	4
					25	Int.	□	MWS0155X25DB	43.3	1.705	46.3	1.823	86.3	3.398	86	3.386	0.3	.012	3.0	.118	4
					30	Int.	□	MWS0155X30DB	51.3	2.020	54.3	2.138	95.3	3.752	95	3.740	0.3	.012	3.0	.118	4
1.588	.0625	1/16			1	Int.	●	MWS00625SB	8.3	.327	11.3	.445	68.3	2.689	68	2.677	0.3	.012	3.175	.125	2
					12	Int.	●	MWS00625XB	30.3	1.193	33.3	1.311	68.3	2.689	68	2.677	0.3	.012	3.175	.125	4
1.600	.0630				1	Int.	●	MWS0160SB	8.3	.327	10.9	.429	68.3	2.689	68	2.677	0.3	.012	3.0	.118	2
					5	Int.	★	MWS0160LB	22.3	.878	25.3	.996	68.3	2.689	68	2.677	0.3	.012	3.0	.118	4
					12	Int.	●	MWS0160XB	30.3	1.193	33.3	1.311	68.3	2.689	68	2.677	0.3	.012	3.0	.118	4
					20	Int.	●	MWS0160X20DB	37.3	1.469	39.3	1.547	78.3	3.083	78	3.071	0.3	.012	3.0	.118	4
					25	Int.	●	MWS0160X25DB	45.3	1.783	47.3	1.862	86.3	3.398	86	3.386	0.3	.012	3.0	.118	4
					30	Int.	●	MWS0160X30DB	53.3	2.098	55.3	2.177	95.3	3.752	95	3.740	0.3	.012	3.0	.118	4
1.613	.0635		52		1	Int.	●	MWS00635SB	8.3	.327	11.2	.441	68.3	2.689	68	2.677	0.3	.012	3.175	.125	2
					12	Int.	●	MWS00635XB	30.3	1.193	33.2	1.307	68.3	2.689	68	2.677	0.3	.012	3.175	.125	4
1.650	.0650				1	Int.	□	MWS0165SB	8.5	.335	11.0	.433	68.3	2.689	68	2.677	0.3	.012	3.0	.118	2
					20	Int.	□	MWS0165X20DB	38.3	1.508	40.3	1.587	78.3	3.083	78	3.071	0.3	.012	3.0	.118	4
					25	Int.	□	MWS0165X25DB	46.3	1.823	49.3	1.941	86.3	3.398	86	3.386	0.3	.012	3.0	.118	4
					30	Int.	□	MWS0165X30DB	54.3	2.138	57.3	2.256	95.3	3.752	95	3.740	0.3	.012	3.0	.118	4
1.700	.0670		51		1	Int.	●	MWS0170SB	8.7	.343	11.1	.437	68.3	2.689	68	2.677	0.3	.012	3.0	.118	2
					5	Int.	★	MWS0170LB	22.4	.882	24.4	.961	68.4	2.693	68	2.677	0.4	.016	3.0	.118	4
					12	Int.	●	MWS0170XB	30.4	1.197	32.4	1.276	68.4	2.693	68	2.677	0.4	.016	3.0	.118	4
					20	Int.	●	MWS0170X20DB	39.3	1.547	42.3	1.665	78.3	3.083	78	3.071	0.3	.012	3.0	.118	4
					25	Int.	●	MWS0170X25DB	48.3	1.902	50.3	1.980	86.3	3.398	86	3.386	0.3	.012	3.0	.118	4
					30	Int.	★	MWS0170X30DB	56.3	2.217	59.3	2.335	95.3	3.752	95	3.740	0.3	.012	3.0	.118	4
1.702	.0670		51		1	Int.	●	MWS00670SB	8.7	.343	11.4	.449	68.3	2.689	68	2.677	0.3	.012	3.175	.125	2
					12	Int.	●	MWS00670XB	30.4	1.197	33.1	1.303	68.4	2.693	68	2.677	0.4	.016	3.175	.125	4

CUTTING CONDITIONS ➤ L088
HOW TO USE ➤ L094
TECHNICAL DATA ➤ N001

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
1.750	.0689				1	Int.	●	MWS0175SB	8.9	.350	11.2	.441	68.3	2.689	68	2.677	0.3	.012	3.0	.118	2
					20	Int.	□	MWS0175X20DB	40.3	1.587	43.3	1.705	84.3	3.319	84	3.307	0.3	.012	3.0	.118	4
					25	Int.	□	MWS0175X25DB	49.3	1.941	51.3	2.020	94.3	3.713	94	3.701	0.3	.012	3.0	.118	4
					30	Int.	□	MWS0175X30DB	58.3	2.295	60.3	2.374	102.3	4.028	102	4.016	0.3	.012	3.0	.118	4
1.778	.0700		50	#2-56	1	Int.	●	MWS00700SB	9.3	.366	11.9	.469	68.3	2.689	68	2.677	0.3	.012	3.175	.125	2
					12	Int.	●	MWS00700XB	30.4	1.197	33.0	1.299	68.4	2.693	68	2.677	0.4	.016	3.175	.125	4
1.800	.0709				1	Int.	●	MWS0180SB	9.3	.366	11.5	.453	68.3	2.689	68	2.677	0.3	.012	3.0	.118	2
					5	Int.	★	MWS0180LB	22.4	.882	24.4	.961	68.4	2.693	68	2.677	0.4	.016	3.0	.118	4
					12	Int.	●	MWS0180XB	30.4	1.197	32.4	1.276	68.4	2.693	68	2.677	0.4	.016	3.0	.118	4
					20	Int.	●	MWS0180X20DB	41.3	1.626	44.3	1.744	84.3	3.319	84	3.307	0.3	.012	3.0	.118	4
					25	Int.	●	MWS0180X25DB	50.3	1.980	53.3	2.098	94.3	3.713	94	3.701	0.3	.012	3.0	.118	4
					30	Int.	●	MWS0180X30DB	59.3	2.335	62.3	2.453	102.3	4.028	102	4.016	0.3	.012	3.0	.118	4
1.850	.0728				1	Int.	□	MWS0185SB	9.5	.374	11.6	.457	68.3	2.689	68	2.677	0.3	.012	3.0	.118	2
					20	Int.	□	MWS0185X20DB	43.3	1.705	45.3	1.783	84.3	3.319	84	3.307	0.3	.012	3.0	.118	4
					25	Int.	□	MWS0185X25DB	52.3	2.059	54.3	2.138	94.3	3.713	94	3.701	0.3	.012	3.0	.118	4
					30	Int.	□	MWS0185X30DB	61.3	2.413	63.3	2.492	102.3	4.028	102	4.016	0.3	.012	3.0	.118	4
1.854	.0730		49		1	Int.	●	MWS00730SB	9.5	.374	12.0	.472	68.3	2.689	68	2.677	0.3	.012	3.175	.125	2
					12	Int.	●	MWS00730XB	30.4	1.197	32.9	1.295	68.4	2.693	68	2.677	0.4	.016	3.175	.125	4
1.900	.0748				1	Int.	●	MWS0190SB	9.8	.386	11.9	.469	68.4	2.693	68	2.677	0.4	.016	3.0	.118	2
					5	Int.	★	MWS0190LB	22.4	.882	24.4	.961	68.4	2.693	68	2.677	0.4	.016	3.0	.118	4
					12	Int.	★	MWS0190XB	30.4	1.197	32.4	1.276	68.4	2.693	68	2.677	0.4	.016	3.0	.118	4
					20	Int.	●	MWS0190X20DB	44.4	1.748	46.4	1.827	84.4	3.323	84	3.307	0.4	.016	3.0	.118	4
					25	Int.	●	MWS0190X25DB	53.4	2.102	55.4	2.181	94.4	3.717	94	3.701	0.4	.016	3.0	.118	4
					30	Int.	●	MWS0190X30DB	63.4	2.496	65.4	2.575	102.4	4.031	102	4.016	0.4	.016	3.0	.118	4
1.930	.0760		48		1	Int.	●	MWS00760SB	10	.394	12.3	.484	68.4	2.693	68	2.677	0.4	.016	3.175	.125	2
					12	Int.	●	MWS00760XB	30.4	1.197	32.7	1.287	68.4	2.693	68	2.677	0.4	.016	3.175	.125	4
1.950	.0768				1	Int.	□	MWS0195SB	10	.394	12.0	.472	68.4	2.693	68	2.677	0.4	.016	3.0	.118	2
					20	Int.	□	MWS0195X20DB	45.4	1.787	47.4	1.866	84.4	3.323	84	3.307	0.4	.016	3.0	.118	4
					25	Int.	□	MWS0195X25DB	55.4	2.181	57.4	2.260	94.4	3.717	94	3.701	0.4	.016	3.0	.118	4
					30	Int.	□	MWS0195X30DB	64.4	2.535	66.4	2.614	102.4	4.031	102	4.016	0.4	.016	3.0	.118	4
1.994	.0785				1	Int.	●	MWS00785SB	10.4	.409	12.6	.496	68.4	2.693	68	2.677	0.4	.016	3.175	.125	2
					12	Int.	●	MWS00785XB	30.4	1.197	32.6	1.283	68.4	2.693	68	2.677	0.4	.016	3.175	.125	4
2.000	.0787			#3-48	1	Int.	●	MWS0200SB	10.4	.409	12.3	.484	68.4	2.693	68	2.677	0.4	.016	3.0	.118	2
					5	Int.	●	MWS0200LB	22.4	.882	24.4	.961	68.4	2.693	68	2.677	0.4	.016	3.0	.118	4
					12	Int.	●	MWS0200XB	30.4	1.197	32.4	1.276	68.4	2.693	68	2.677	0.4	.016	3.0	.118	4
					20	Int.	●	MWS0200X20DB	46.4	1.827	48.4	1.906	84.4	3.323	84	3.307	0.4	.016	3.0	.118	4
					25	Int.	●	MWS0200X25DB	56.4	2.220	58.4	2.299	94.4	3.717	94	3.701	0.4	.016	3.0	.118	4
					30	Int.	●	MWS0200X30DB	66.4	2.614	68.4	2.693	102.4	4.031	102	4.016	0.4	.016	3.0	.118	4
2.050	.0807				1	Int.	●	MWS0205SB	10.5	.413	12.3	.484	74.3	2.925	74	2.913	0.3	.012	3.0	.118	2
					20	Int.	□	MWS0205X20DB	47.4	1.866	49.4	1.945	94.4	3.717	94	3.701	0.4	.016	3.0	.118	4
					25	Int.	□	MWS0205X25DB	57.4	2.260	59.4	2.339	107.4	4.228	107	4.213	0.4	.016	3.0	.118	4
					30	Int.	□	MWS0205X30DB	68.4	2.693	69.4	2.732	118.4	4.661	118	4.646	0.4	.016	3.0	.118	4
2.057	.0810		46		1	Int.	●	MWS00810SB	10.5	.413	12.6	.496	74.3	2.925	74	2.913	0.3	.012	3.175	.125	2
					12	Int.	●	MWS00810XB	38.4	1.512	40.5	1.594	74.4	2.929	74	2.913	0.4	.016	3.175	.125	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

□ : Non stock, produced to order only.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.100	.0827				1	Int.	●	MWS0210SB	10.7	.421	12.4	.488	68.3	2.689	68	2.677	0.3	.012	3.0	.118	2
					5	Int.	★	MWS0210LB	28.4	1.118	30.4	1.197	74.4	2.929	74	2.913	0.4	.016	3.0	.118	4
					12	Int.	●	MWS0210XB	38.4	1.512	40.4	1.591	74.4	2.929	74	2.913	0.4	.016	3.0	.118	4
					20	Int.	★	MWS0210X20DB	48.4	1.906	50.4	1.984	94.4	3.717	94	3.701	0.4	.016	3.0	.118	4
					25	Int.	★	MWS0210X25DB	59.4	2.339	60.4	2.378	107.4	4.228	107	4.213	0.4	.016	3.0	.118	4
					30	Int.	●	MWS0210X30DB	69.4	2.732	71.4	2.811	118.4	4.661	118	4.646	0.4	.016	3.0	.118	4
2.150	.0846				1	Int.	□	MWS0215SB	10.9	.429	12.5	.492	74.3	2.925	74	2.913	0.3	.012	3.0	.118	2
					20	Int.	□	MWS0215X20DB	49.4	1.945	51.4	2.024	94.4	3.717	94	3.701	0.4	.016	3.0	.118	4
					25	Int.	□	MWS0215X25DB	60.4	2.378	62.4	2.457	107.4	4.228	107	4.213	0.4	.016	3.0	.118	4
					30	Int.	□	MWS0215X30DB	71.4	2.811	73.4	2.890	118.4	4.661	118	4.646	0.4	.016	3.0	.118	4
2.184	.0860		44		1	Int.	●	MWS00860SB	11.3	.445	13.1	.516	74.3	2.925	74	2.913	0.3	.012	3.175	.125	2
					12	Int.	●	MWS00860XB	38.4	1.512	40.2	1.583	74.4	2.929	74	2.913	0.4	.016	3.175	.125	4
2.200	.0866				1	Int.	●	MWS0220SB	11.4	.449	12.9	.508	74.4	2.929	74	2.913	0.4	.016	3.0	.118	2
					5	Int.	★	MWS0220LB	28.4	1.118	29.4	1.157	74.4	2.929	74	2.913	0.4	.016	3.0	.118	4
					12	Int.	●	MWS0220XB	38.4	1.512	39.4	1.551	74.4	2.929	74	2.913	0.4	.016	3.0	.118	4
					20	Int.	★	MWS0220X20DB	51.4	2.024	52.4	2.063	94.4	3.717	94	3.701	0.4	.016	3.0	.118	4
					25	Int.	★	MWS0220X25DB	62.4	2.457	63.4	2.496	107.4	4.228	107	4.213	0.4	.016	3.0	.118	4
					30	Int.	●	MWS0220X30DB	73.4	2.890	74.4	2.929	118.4	4.661	118	4.646	0.4	.016	3.0	.118	4
2.250	.0886				1	Int.	●	MWS0225SB	11.6	.457	13.0	.512	74.4	2.929	74	2.913	0.4	.016	3.0	.118	2
					20	Int.	□	MWS0225X20DB	52.4	2.063	53.4	2.102	94.4	3.717	94	3.701	0.4	.016	3.0	.118	4
					25	Int.	□	MWS0225X25DB	63.4	2.496	64.4	2.535	107.4	4.228	107	4.213	0.4	.016	3.0	.118	4
					30	Int.	□	MWS0225X30DB	74.4	2.929	76.4	3.008	118.4	4.661	118	4.646	0.4	.016	3.0	.118	4
2.261	.0890		43	#4-40	1	Int.	●	MWS00890SB	11.6	.457	13.3	.524	74.4	2.929	74	2.913	0.4	.016	3.175	.125	2
					12	Int.	●	MWS00890XB	38.4	1.512	40.1	1.579	74.4	2.929	74	2.913	0.4	.016	3.175	.125	4
2.300	.0906				1	Int.	●	MWS0230SB	11.8	.465	13.1	.516	74.4	2.929	74	2.913	0.4	.016	3.0	.118	2
					5	Int.	★	MWS0230LB	28.4	1.118	29.4	1.157	74.4	2.929	74	2.913	0.4	.016	3.0	.118	4
					12	Int.	●	MWS0230XB	38.4	1.512	39.4	1.551	74.4	2.929	74	2.913	0.4	.016	3.0	.118	4
					20	Int.	●	MWS0230X20DB	53.4	2.102	54.4	2.142	94.4	3.717	94	3.701	0.4	.016	3.0	.118	4
					25	Int.	●	MWS0230X25DB	64.4	2.535	66.4	2.614	107.4	4.228	107	4.213	0.4	.016	3.0	.118	4
					30	Int.	●	MWS0230X30DB	76.4	3.008	77.4	3.047	118.4	4.661	118	4.646	0.4	.016	3.0	.118	4
2.350	.0925				1	Int.	●	MWS0235SB	12.0	.472	13.2	.520	74.4	2.929	74	2.913	0.4	.016	3.0	.118	2
					20	Int.	●	MWS0235X20DB	54.4	2.142	55.4	2.181	94.4	3.717	94	3.701	0.4	.016	3.0	.118	4
					25	Int.	□	MWS0235X25DB	66.4	2.614	67.4	2.654	107.4	4.228	107	4.213	0.4	.016	3.0	.118	4
					30	Int.	□	MWS0235X30DB	78.4	3.087	79.4	3.126	118.4	4.661	118	4.646	0.4	.016	3.0	.118	4
2.383	.0938	3/32			1	Int.	●	MWS00938SB	12.4	.488	13.9	.547	74.4	2.929	74	2.913	0.4	.016	3.175	.125	2
					12	Int.	●	MWS00938XB	38.4	1.512	39.9	1.571	74.4	2.929	74	2.913	0.4	.016	3.175	.125	4
2.400	.0945				1	Int.	●	MWS0240SB	12.4	.488	13.5	.531	74.4	2.929	74	2.913	0.4	.016	3.0	.118	2
					5	Int.	★	MWS0240LB	28.4	1.118	29.4	1.157	74.4	2.929	74	2.913	0.4	.016	3.0	.118	4
					12	Int.	●	MWS0240XB	38.4	1.512	39.4	1.551	74.4	2.929	74	2.913	0.4	.016	3.0	.118	4
					20	Int.	●	MWS0240X20DB	55.4	2.181	56.4	2.220	94.4	3.717	94	3.701	0.4	.016	3.0	.118	4
					25	Int.	●	MWS0240X25DB	67.4	2.654	68.4	2.693	107.4	4.228	107	4.213	0.4	.016	3.0	.118	4
					30	Int.	●	MWS0240X30DB	79.4	3.126	80.4	3.165	118.4	4.661	118	4.646	0.4	.016	3.0	.118	4
2.438	.0960		41		1	Int.	●	MWS00960SB	12.6	.496	14.0	.551	74.4	2.929	74	2.913	0.4	.016	3.175	.125	2
					12	Int.	●	MWS00960XB	38.4	1.512	39.8	1.567	74.4	2.929	74	2.913	0.4	.016	3.175	.125	4
2.450	.0965				1	Int.	□	MWS0245SB	12.6	.496	13.6	.535	74.4	2.929	74	2.913	0.4	.016	3.0	.118	2
					20	Int.	□	MWS0245X20DB	56.5	2.224	57.5	2.264	94.5	3.720	94	3.701	0.5	.020	3.0	.118	4
					25	Int.	□	MWS0245X25DB	69.5	2.736	70.5	2.776	107.5	4.232	107	4.213	0.5	.020	3.0	.118	4
					30	Int.	□	MWS0245X30DB	81.5	3.209	82.5	3.248	118.5	4.665	118	4.646	0.5	.020	3.0	.118	4

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.500	.0984				1	Int.	●	MWS0250SB	12.8	.504	13.7	.539	74.4	2.929	74	2.913	0.4	.016	3.0	.118	2
					5	Int.	●	MWS0250LB	28.5	1.122	29.5	1.161	74.5	2.933	74	2.913	0.5	.020	3.0	.118	4
					12	Int.	●	MWS0250XB	38.5	1.516	39.5	1.555	74.5	2.933	74	2.913	0.5	.020	3.0	.118	4
					20	Int.	●	MWS0250X20DB	58.5	2.303	59.5	2.343	94.5	3.720	94	3.701	0.5	.020	3.0	.118	4
					25	Int.	●	MWS0250X25DB	70.5	2.776	71.5	2.815	107.5	4.232	107	4.213	0.5	.020	3.0	.118	4
					30	Int.	●	MWS0250X30DB	83.5	3.287	84.5	3.327	118.5	4.665	118	4.646	0.5	.020	3.0	.118	4
2.550	.1004				1	Int.	□	MWS0255SB	13.0	.512	13.0	.512	81.4	3.205	81	3.189	0.4	.016	3.0	.118	3
					20	Int.	□	MWS0255X20DB	59.5	2.343	59.5	2.343	103.5	4.075	103	4.055	0.5	.020	3.0	.118	5
					25	Int.	□	MWS0255X25DB	71.5	2.815	71.5	2.815	117.5	4.626	117	4.606	0.5	.020	3.0	.118	5
					30	Int.	□	MWS0255X30DB	84.5	3.327	84.5	3.327	132.5	5.217	132	5.197	0.5	.020	3.0	.118	5
2.565	.1010				1	Int.	●	MWS01010SB	13.0	.512	13.0	.512	81.4	3.205	81	3.189	0.4	.016	3.175	.125	3
					12	Int.	●	MWS01010XB	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.175	.125	5
2.600	.1024				1	Int.	●	MWS0260SB	13.4	.528	13.4	.528	81.4	3.205	81	3.189	0.4	.016	3.0	.118	3
					5	Int.	★	MWS0260LB	33.5	1.319	33.5	1.319	81.5	3.209	81	3.189	0.5	.020	3.0	.118	5
					12	Int.	●	MWS0260XB	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.0	.118	5
					20	Int.	●	MWS0260X20DB	60.5	2.382	60.5	2.382	103.5	4.075	103	4.055	0.5	.020	3.0	.118	5
					25	Int.	●	MWS0260X25DB	73.5	2.894	73.5	2.894	117.5	4.626	117	4.606	0.5	.020	3.0	.118	5
					30	Int.	●	MWS0260X30DB	86.5	3.406	86.5	3.406	132.5	5.217	132	5.197	0.5	.020	3.0	.118	5
2.642	.1040		37	#5-44	1	Int.	●	MWS01040SB	13.6	.535	13.6	.535	81.4	3.205	81	3.189	0.4	.016	3.175	.125	3
					12	Int.	●	MWS01040XB	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.175	.125	5
2.650	.1043				1	Int.	□	MWS0265SB	13.6	.535	13.6	.535	81.4	3.205	81	3.189	0.4	.016	3.0	.118	3
					20	Int.	□	MWS0265X20DB	61.5	2.421	61.5	2.421	103.5	4.075	103	4.055	0.5	.020	3.0	.118	5
					25	Int.	□	MWS0265X25DB	74.5	2.933	74.5	2.933	117.5	4.626	117	4.606	0.5	.020	3.0	.118	5
					30	Int.	□	MWS0265X30DB	87.5	3.445	87.5	3.445	132.5	5.217	132	5.197	0.5	.020	3.0	.118	5
2.692	.1060				1	Int.	●	MWS01060SB	13.8	.543	13.8	.543	81.4	3.205	81	3.189	0.4	.016	3.175	.125	3
					12	Int.	●	MWS01060XB	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.175	.125	5
2.700	.1063		36	#6-32	1	Int.	●	MWS0270SB	13.8	.543	13.8	.543	81.4	3.205	81	3.189	0.4	.016	3.0	.118	3
					5	Int.	★	MWS0270LB	33.5	1.319	33.5	1.319	81.5	3.209	81	3.189	0.5	.020	3.0	.118	5
					12	Int.	●	MWS0270XB	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.0	.118	5
					20	Int.	★	MWS0270X20DB	62.5	2.461	62.5	2.461	103.5	4.075	103	4.055	0.5	.020	3.0	.118	5
					25	Int.	●	MWS0270X25DB	76.5	3.012	76.5	3.012	117.5	4.626	117	4.606	0.5	.020	3.0	.118	5
					30	Int.	●	MWS0270X30DB	89.5	3.524	89.5	3.524	132.5	5.217	132	5.197	0.5	.020	3.0	.118	5
2.750	.1083				1	Int.	□	MWS0275SB	14.0	.551	14.0	.551	81.4	3.205	81	3.189	0.4	.016	3.0	.118	3
					20	Int.	□	MWS0275X20DB	63.5	2.500	63.5	2.500	103.5	4.075	103	4.055	0.5	.020	3.0	.118	5
					25	Int.	□	MWS0275X25DB	77.5	3.051	77.5	3.051	117.5	4.626	117	4.606	0.5	.020	3.0	.118	5
					30	Int.	□	MWS0275X30DB	91.5	3.602	91.5	3.602	132.5	5.217	132	5.197	0.5	.020	3.0	.118	5
2.779	.1094	7/64			1	Int.	●	MWS01094SB	14.4	.567	14.4	.567	81.4	3.205	81	3.189	0.4	.016	3.175	.125	3
					12	Int.	●	MWS01094XB	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.175	.125	5
2.80	.1102		35		1	Int.	●	MWS0280SB	14.4	.567	14.4	.567	81.4	3.205	81	3.189	0.4	.016	3.0	.118	3
					5	Int.	★	MWS0280LB	33.5	1.319	33.5	1.319	81.5	3.209	81	3.189	0.5	.020	3.0	.118	5
					12	Int.	●	MWS0280XB	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.0	.118	5
					20	Int.	●	MWS0280X20DB	64.5	2.539	64.5	2.539	103.5	4.075	103	4.055	0.5	.020	3.0	.118	5
					25	Int.	●	MWS0280X25DB	78.5	3.091	78.5	3.091	117.5	4.626	117	4.606	0.5	.020	3.0	.118	5
					30	Int.	●	MWS0280X30DB	92.5	3.642	92.5	3.642	132.5	5.217	132	5.197	0.5	.020	3.0	.118	5
2.85	.1122				1	Int.	□	MWS0285SB	14.7	.579	14.7	.579	81.5	3.209	81	3.189	0.5	.020	3.0	.118	3
					20	Int.	□	MWS0285X20DB	66.5	2.618	66.5	2.618	103.5	4.075	103	4.055	0.5	.020	3.0	.118	5
					25	Int.	□	MWS0285X25DB	80.5	3.169	80.5	3.169	117.5	4.626	117	4.606	0.5	.020	3.0	.118	5
					30	Int.	□	MWS0285X30DB	94.5	3.720	94.5	3.720	132.5	5.217	132	5.197	0.5	.020	3.0	.118	5

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

▲ : This item to be discontinued within two years. □ : Non stock, produced to order only.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.90	**.1142**				1	Int.	●	**MWS0290SB**	14.9	.587	14.9	.587	81.5	3.209	81	3.189	0.5	.020	3.0	.118	3
					5	Int.	●	**MWS0290LB**	33.5	1.319	33.5	1.319	81.5	3.209	81	3.189	0.5	.020	3.0	.118	5
					12	Int.	●	**MWS0290XB**	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.0	.118	5
					20	Int.	★	**MWS0290X20DB**	67.5	2.657	67.5	2.657	103.5	4.075	103	4.055	0.5	.020	3.0	.118	5
					25	Int.	★	**MWS0290X25DB**	81.5	3.209	81.5	3.209	117.5	4.626	117	4.606	0.5	.020	3.0	.118	5
					30	Int.	★	**MWS0290X30DB**	96.5	3.799	96.5	3.799	132.5	5.217	132	5.197	0.5	.020	3.0	.118	5
2.95	**.1161**		**32**		1	Int.	□	**MWS0295SB**	15.1	.594	15.1	.594	81.5	3.209	81	3.189	0.5	.020	3.0	.118	3
					20	Int.	□	**MWS0295X20DB**	68.5	2.697	68.5	2.697	103.5	4.075	103	4.055	0.5	.020	3.0	.118	5
					25	Int.	□	**MWS0295X25DB**	83.5	3.287	83.5	3.287	117.5	4.626	117	4.606	0.5	.020	3.0	.118	5
					30	Int.	□	**MWS0295X30DB**	97.5	3.839	97.5	3.839	132.5	5.217	132	5.197	0.5	.020	3.0	.118	5
3.0	**.1181**				2	Ext.	▲	**MWE0300SA**	16.6	.654	16.6	.654	55.6	2.189	55	2.165	0.6	.024	3.0	.118	1
					3	Ext.	▲	**MWE0300MA**	21.6	.850	21.6	.850	60.6	2.386	60	2.362	0.6	.024	3.0	.118	1
					3	Int.	▲	**MWS0300MB**	24.6	.969	24.6	.969	72.6	2.858	72	2.835	0.6	.024	3.0	.118	6
					5	Int.	▲	**MWS0300LB**	33.6	1.323	33.6	1.323	81.6	3.213	81	3.189	0.6	.024	3.0	.118	6
					8	Int.	▲	**MWS0300X8DB**	35.6	1.402	35.6	1.402	81.6	3.213	81	3.189	0.6	.024	3.0	.118	6
					10	Int.	★	**MWS0300X10DB**	39.6	1.559	42.6	1.677	90.6	3.567	90	3.543	0.6	.024	3.0	.118	7
					15	Int.	★	**MWS0300X15DB**	54.6	2.150	57.6	2.268	105.6	4.157	105	4.134	0.6	.024	3.0	.118	7
					20	Int.	★	**MWS0300X20DB**	69.6	2.740	72.6	2.858	120.6	4.748	120	4.724	0.6	.024	3.0	.118	7
					25	Int.	★	**MWS0300X25DB**	84.6	3.331	87.6	3.449	135.6	5.339	135	5.315	0.6	.024	3.0	.118	7
					30	Int.	★	**MWS0300X30DB**	99.6	3.921	102.6	4.039	150.6	5.929	150	5.906	0.6	.024	3.0	.118	7
3.048	**.1200**		**31**		1	Int.	●	**MWS01200SB**	15.7	.618	15.7	.618	87.5	3.445	87	3.425	0.5	.020	3.175	.125	2
					12	Int.	●	**MWS01200XB**	52.6	2.071	52.6	2.071	87.6	3.449	87	3.425	0.6	.024	3.175	.125	5
3.1	**.1220**				2	Ext.	▲	**MWE0310SA**	18.6	.732	18.6	.732	55.6	2.189	55	2.165	0.6	.024	3.1	.122	1
					3	Ext.	▲	**MWE0310MA**	24.6	.969	24.6	.969	60.6	2.386	60	2.362	0.6	.024	3.1	.122	1
					3	Int.	▲	**MWS0310MB**	28.6	1.126	28.6	1.126	76.6	3.016	76	2.992	0.6	.024	4.0	.157	6
					5	Int.	▲	**MWS0310LB**	39.6	1.559	39.6	1.559	87.6	3.449	87	3.425	0.6	.024	4.0	.157	6
					8	Int.	▲	**MWS0310X8DB**	41.6	1.638	41.6	1.638	87.6	3.449	87	3.425	0.6	.024	4.0	.157	6
					10	Int.	★	**MWS0310X10DB**	46.6	1.835	49.6	1.953	97.6	3.843	97	3.819	0.6	.024	4.0	.157	7
					15	Int.	●	**MWS0310X15DB**	63.6	2.504	66.6	2.622	114.6	4.512	114	4.488	0.6	.024	4.0	.157	7
					20	Int.	●	**MWS0310X20DB**	81.6	3.213	84.6	3.331	132.6	5.220	132	5.197	0.6	.024	4.0	.157	7
					25	Int.	★	**MWS0310X25DB**	98.6	3.882	101.6	4.000	149.6	5.890	149	5.866	0.6	.024	4.0	.157	7
					30	Int.	★	**MWS0310X30DB**	116.6	4.591	119.6	4.709	167.6	6.598	167	6.575	0.6	.024	4.0	.157	7
3.175	**.1250**	**1/8**			5	Int.	▲	**MWS01250LB**	39.6	1.559	39.6	1.559	87.6	3.449	87	3.425	0.6	.024	4.0	.157	6
					8	Int.	▲	**MWS01250X8DB**	39.6	1.559	39.6	1.559	87.6	3.449	87	3.425	0.6	.024	4.0	.157	6
					15	Int.	●	**MWS01250X15DB**	63.6	2.504	66.6	2.622	114.6	4.512	114	4.488	0.6	.024	4.0	.157	7
					20	Int.	●	**MWS01250X20DB**	81.6	3.213	84.6	3.331	132.6	5.220	132	5.197	0.6	.024	4.0	.157	7
					25	Int.	●	**MWS01250X25DB**	98.6	3.882	101.6	4.000	149.6	5.890	149	5.866	0.6	.024	4.0	.157	7
					30	Int.	●	**MWS01250X30DB**	116.6	4.591	119.6	4.709	167.6	6.598	167	6.575	0.6	.024	4.0	.157	7
3.2	**.1260**				2	Ext.	▲	**MWE0320SA**	18.6	.732	18.6	.732	55.6	2.189	55	2.165	0.6	.024	3.2	.126	1
					3	Ext.	▲	**MWE0320MA**	24.6	.969	24.6	.969	60.6	2.386	60	2.362	0.6	.024	3.2	.126	1
					3	Int.	▲	**MWS0320MB**	28.6	1.126	28.6	1.126	76.6	3.016	76	2.992	0.6	.024	4.0	.157	6
					5	Int.	▲	**MWS0320LB**	39.6	1.559	39.6	1.559	87.6	3.449	87	3.425	0.6	.024	4.0	.157	6
					8	Int.	▲	**MWS0320X8DB**	41.6	1.638	41.6	1.638	87.6	3.449	87	3.425	0.6	.024	4.0	.157	6
					10	Int.	●	**MWS0320X10DB**	46.6	1.835	49.6	1.953	97.6	3.843	97	3.819	0.6	.024	4.0	.157	7
					15	Int.	●	**MWS0320X15DB**	63.6	2.504	66.6	2.622	114.6	4.512	114	4.488	0.6	.024	4.0	.157	7
					20	Int.	★	**MWS0320X20DB**	81.6	3.213	84.6	3.331	132.6	5.220	132	5.197	0.6	.024	4.0	.157	7
					25	Int.	★	**MWS0320X25DB**	98.6	3.882	101.6	4.000	149.6	5.890	149	5.866	0.6	.024	4.0	.157	7
					30	Int.	●	**MWS0320X30DB**	116.6	4.591	119.6	4.709	167.6	6.598	167	6.575	0.6	.024	4.0	.157	7

CUTTING CONDITIONS ➤ L088
HOW TO USE ➤ L094
TECHNICAL DATA ➤ N001

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
3.3	.1299			M4x0.7	2	Ext.	▲	MWE0330SA	18.6	.732	18.6	.732	55.6	2.189	55	2.165	0.6	.024	3.3	.130	1
					3	Ext.	▲	MWE0330MA	24.6	.969	24.6	.969	60.6	2.386	60	2.362	0.6	.024	3.3	.130	1
					3	Int.	▲	MWS0330MB	28.6	1.126	28.6	1.126	76.6	3.016	76	2.992	0.6	.024	4.0	.157	6
					5	Int.	▲	MWS0330LB	39.6	1.559	39.6	1.559	87.6	3.449	87	3.425	0.6	.024	4.0	.157	6
					8	Int.	▲	MWS0330X8DB	41.6	1.638	41.6	1.638	87.6	3.449	87	3.425	0.6	.024	4.0	.157	6
					10	Int.	●	MWS0330X10DB	46.6	1.835	49.6	1.953	97.6	3.843	97	3.819	0.6	.024	4.0	.157	7
					15	Int.	●	MWS0330X15DB	63.6	2.504	66.6	2.622	114.6	4.512	114	4.488	0.6	.024	4.0	.157	7
					20	Int.	●	MWS0330X20DB	81.6	3.213	84.6	3.331	132.6	5.220	132	5.197	0.6	.024	4.0	.157	7
					25	Int.	★	MWS0330X25DB	98.6	3.882	101.6	4.000	149.6	5.890	149	5.866	0.6	.024	4.0	.157	7
					30	Int.	●	MWS0330X30DB	116.6	4.591	119.6	4.709	167.6	6.598	167	6.575	0.6	.024	4.0	.157	7
3.4	.1339				2	Ext.	▲	MWE0340SA	20.6	.811	20.6	.811	55.6	2.189	55	2.165	0.6	.024	3.4	.134	1
					3	Ext.	▲	MWE0340MA	24.6	.969	24.6	.969	60.6	2.386	60	2.362	0.6	.024	3.4	.134	1
					3	Int.	▲	MWS0340MB	28.6	1.126	28.6	1.126	76.6	3.016	76	2.992	0.6	.024	4.0	.157	6
					5	Int.	▲	MWS0340LB	39.6	1.559	39.6	1.559	87.6	3.449	87	3.425	0.6	.024	4.0	.157	6
					8	Int.	▲	MWS0340X8DB	41.6	1.638	41.6	1.638	87.6	3.449	87	3.425	0.6	.024	4.0	.157	6
					10	Int.	★	MWS0340X10DB	46.6	1.835	49.6	1.953	97.6	3.843	97	3.819	0.6	.024	4.0	.157	7
					15	Int.	●	MWS0340X15DB	63.6	2.504	66.6	2.622	114.6	4.512	114	4.488	0.6	.024	4.0	.157	7
					20	Int.	★	MWS0340X20DB	81.6	3.213	84.6	3.331	132.6	5.220	132	5.197	0.6	.024	4.0	.157	7
					25	Int.	★	MWS0340X25DB	98.6	3.882	101.6	4.000	149.6	5.890	149	5.866	0.6	.024	4.0	.157	7
					30	Int.	★	MWS0340X30DB	116.6	4.591	119.6	4.709	167.6	6.598	167	6.575	0.6	.024	4.0	.157	7
3.5	.1378				2	Ext.	▲	MWE0350SA	20.6	.811	20.6	.811	55.6	2.189	55	2.165	0.6	.024	3.5	.138	1
					3	Ext.	▲	MWE0350MA	24.6	.969	24.6	.969	60.6	2.386	60	2.362	0.6	.024	3.5	.138	1
					3	Int.	▲	MWS0350MB	28.6	1.126	28.6	1.126	76.6	3.016	76	2.992	0.6	.024	4.0	.157	6
					5	Int.	▲	MWS0350LB	39.6	1.559	39.6	1.559	87.6	3.449	87	3.425	0.6	.024	4.0	.157	6
					8	Int.	▲	MWS0350X8DB	41.6	1.638	41.6	1.638	87.6	3.449	87	3.425	0.6	.024	4.0	.157	6
					10	Int.	●	MWS0350X10DB	46.6	1.835	49.6	1.953	97.6	3.843	97	3.819	0.6	.024	4.0	.157	7
					15	Int.	●	MWS0350X15DB	63.6	2.504	66.6	2.622	114.6	4.512	114	4.488	0.6	.024	4.0	.157	7
					20	Int.	●	MWS0350X20DB	81.6	3.213	84.6	3.331	132.6	5.220	132	5.197	0.6	.024	4.0	.157	7
					25	Int.	●	MWS0350X25DB	98.6	3.882	101.6	4.000	149.6	5.890	149	5.866	0.6	.024	4.0	.157	7
					30	Int.	●	MWS0350X30DB	116.6	4.591	119.6	4.709	167.6	6.598	167	6.575	0.6	.024	4.0	.157	7
3.569	.1405		28		5	Int.	▲	MWS01405LB	44.7	1.760	44.7	1.760	92.7	3.650	92	3.622	0.7	.028	4.0	.157	6
3.571	.1406	9/64			8	Int.	▲	MWS01406X8DB	44.7	1.760	44.7	1.760	92.7	3.650	92	3.622	0.7	.028	4.0	.157	6
					15	Int.	●	MWS01406X15DB	72.7	2.862	75.7	2.980	123.7	4.870	123	4.843	0.7	.028	4.0	.157	7
					20	Int.	●	MWS01406X20DB	92.7	3.650	95.7	3.768	143.7	5.657	143	5.630	0.7	.028	4.0	.157	7
					25	Int.	●	MWS01406X25DB	112.7	4.437	115.7	4.555	163.7	6.445	163	6.417	0.7	.028	4.0	.157	7
					30	Int.	●	MWS01406X30DB	132.7	5.224	135.7	5.343	183.7	7.232	183	7.205	0.7	.028	4.0	.157	7
3.600	.1417				2	Ext.	▲	MWE0360SA	20.7	.815	20.7	.815	55.7	2.193	55	2.165	0.7	.028	3.6	.142	1
					3	Ext.	▲	MWE0360MA	27.7	1.091	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	3.6	.142	1
					3	Int.	▲	MWS0360MB	32.7	1.287	32.7	1.287	80.7	3.177	80	3.150	0.7	.028	4.0	.157	6
					5	Int.	▲	MWS0360LB	44.7	1.760	44.7	1.760	92.7	3.650	92	3.622	0.7	.028	4.0	.157	6
					8	Int.	▲	MWS0360X8DB	46.7	1.839	46.7	1.839	92.7	3.650	92	3.622	0.7	.028	4.0	.157	6
					10	Int.	●	MWS0360X10DB	52.7	2.075	55.7	2.193	103.7	4.083	103	4.055	0.7	.028	4.0	.157	7
					15	Int.	★	MWS0360X15DB	72.7	2.862	75.7	2.980	123.7	4.870	123	4.843	0.7	.028	4.0	.157	7
					20	Int.	●	MWS0360X20DB	92.7	3.650	95.7	3.768	143.7	5.657	143	5.630	0.7	.028	4.0	.157	7
					25	Int.	★	MWS0360X25DB	112.7	4.437	115.7	4.555	163.7	6.445	163	6.417	0.7	.028	4.0	.157	7
					30	Int.	★	MWS0360X30DB	132.7	5.224	135.7	5.343	183.7	7.232	183	7.205	0.7	.028	4.0	.157	7

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

▲ : This item to be discontinued within two years.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
3.700	.1457			M4.5x0.75	2	Ext.	▲	MWE0370SA	20.7	.815	20.7	.815	55.7	2.193	55	2.165	0.7	.028	3.7	.146	1
					3	Ext.	▲	MWE0370MA	27.7	1.091	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	3.7	.146	1
					3	Int.	▲	MWS0370MB	32.7	1.287	32.7	1.287	80.7	3.177	80	3.150	0.7	.028	4.0	.157	6
					5	Int.	▲	MWS0370LB	44.7	1.760	44.7	1.760	92.7	3.650	92	3.622	0.7	.028	4.0	.157	6
					8	Int.	▲	MWS0370X8DB	46.7	1.839	46.7	1.839	92.7	3.650	92	3.622	0.7	.028	4.0	.157	6
					10	Int.	★	MWS0370X10DB	52.7	2.075	55.7	2.193	103.7	4.083	103	4.055	0.7	.028	4.0	.157	7
					15	Int.	●	MWS0370X15DB	72.7	2.862	75.7	2.980	123.7	4.870	123	4.843	0.7	.028	4.0	.157	7
					20	Int.	★	MWS0370X20DB	92.7	3.650	95.7	3.768	143.7	5.657	143	5.630	0.7	.028	4.0	.157	7
					25	Int.	★	MWS0370X25DB	112.7	4.437	115.7	4.555	163.7	6.445	163	6.417	0.7	.028	4.0	.157	7
					30	Int.	●	MWS0370X30DB	132.7	5.224	135.7	5.343	183.7	7.232	183	7.205	0.7	.028	4.0	.157	7
3.797	.1495		25	#10-24	5	Int.	▲	MWS01495LB	44.7	1.760	44.7	1.760	92.7	3.650	92	3.622	0.7	.028	4.0	.157	6
					8	Int.	▲	MWS01495X8DB	44.7	1.760	44.7	1.760	92.7	3.650	92	3.622	0.7	.028	4.0	.157	6
					15	Int.	●	MWS01495X15DB	72.7	2.862	75.7	2.980	123.7	4.870	123	4.843	0.7	.028	4.0	.157	7
					20	Int.	●	MWS01495X20DB	92.7	3.650	95.7	3.768	143.7	5.657	143	5.630	0.7	.028	4.0	.157	7
					25	Int.	●	MWS01495X25DB	112.7	4.437	115.7	4.555	163.7	6.445	163	6.417	0.7	.028	4.0	.157	7
					30	Int.	●	MWS01495X30DB	132.7	5.224	135.7	5.343	183.7	7.232	183	7.205	0.7	.028	4.0	.157	7
3.800	.1496		25	#10-24	2	Ext.	▲	MWE0380SA	22.7	.894	22.7	.894	55.7	2.193	55	2.165	0.7	.028	3.8	.150	1
					3	Ext.	▲	MWE0380MA	27.7	1.091	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	3.8	.150	1
					3	Int.	▲	MWS0380MB	32.7	1.287	32.7	1.287	80.7	3.177	80	3.150	0.7	.028	4.0	.157	6
					5	Int.	▲	MWS0380LB	44.7	1.760	44.7	1.760	92.7	3.650	92	3.622	0.7	.028	4.0	.157	6
					8	Int.	▲	MWS0380X8DB	46.7	1.839	46.7	1.839	92.7	3.650	92	3.622	0.7	.028	4.0	.157	6
					10	Int.	★	MWS0380X10DB	52.7	2.075	55.7	2.193	103.7	4.083	103	4.055	0.7	.028	4.0	.157	7
					15	Int.	●	MWS0380X15DB	72.7	2.862	75.7	2.980	123.7	4.870	123	4.843	0.7	.028	4.0	.157	7
					20	Int.	●	MWS0380X20DB	92.7	3.650	95.7	3.768	143.7	5.657	143	5.630	0.7	.028	4.0	.157	7
					25	Int.	★	MWS0380X25DB	112.7	4.437	115.7	4.555	163.7	6.445	163	6.417	0.7	.028	4.0	.157	7
					30	Int.	★	MWS0380X30DB	132.7	5.224	135.7	5.343	183.7	7.232	183	7.205	0.7	.028	4.0	.157	7
3.900	.1535				2	Ext.	▲	MWE0390SA	22.7	.894	22.7	.894	55.7	2.193	55	2.165	0.7	.028	3.9	.154	1
					3	Ext.	▲	MWE0390MA	27.7	1.091	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	3.9	.154	1
					3	Int.	▲	MWS0390MB	32.7	1.287	32.7	1.287	80.7	3.177	80	3.150	0.7	.028	4.0	.157	6
					5	Int.	▲	MWS0390LB	44.7	1.760	44.7	1.760	92.7	3.650	92	3.622	0.7	.028	4.0	.157	6
					8	Int.	▲	MWS0390X8DB	46.7	1.839	46.7	1.839	92.7	3.650	92	3.622	0.7	.028	4.0	.157	6
					10	Int.	★	MWS0390X10DB	52.7	2.075	55.7	2.193	103.7	4.083	103	4.055	0.7	.028	4.0	.157	7
					15	Int.	●	MWS0390X15DB	72.7	2.862	75.7	2.980	123.7	4.870	123	4.843	0.7	.028	4.0	.157	7
					20	Int.	●	MWS0390X20DB	92.7	3.650	95.7	3.768	143.7	5.657	143	5.630	0.7	.028	4.0	.157	7
					25	Int.	★	MWS0390X25DB	112.7	4.437	115.7	4.555	163.7	6.445	163	6.417	0.7	.028	4.0	.157	7
					30	Int.	★	MWS0390X30DB	132.7	5.224	135.7	5.343	183.7	7.232	183	7.205	0.7	.028	4.0	.157	7
3.967	.1562	5/32			5	Int.	▲	MWS01562LB	44.7	1.760	44.7	1.760	92.7	3.650	92	3.622	0.7	.028	4.0	.157	6
					8	Int.	▲	MWS01562X8DB	44.7	1.760	44.7	1.760	92.7	3.650	92	3.622	0.7	.028	4.0	.157	6
					15	Int.	●	MWS01562X15DB	72.7	2.862	75.7	2.980	123.7	4.870	123	4.843	0.7	.028	4.0	.157	7
					20	Int.	●	MWS01562X20DB	92.7	3.650	95.7	3.768	143.7	5.657	143	5.630	0.7	.028	4.0	.157	7
					25	Int.	●	MWS01562X25DB	112.7	4.437	115.7	4.555	163.7	6.445	163	6.417	0.7	.028	4.0	.157	7
					30	Int.	●	MWS01562X30DB	132.7	5.224	135.7	5.343	183.7	7.232	183	7.205	0.7	.028	4.0	.157	7

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.000	.1575				2	Ext.	▲	MWE0400SA	22.7	.894	22.7	.894	55.7	2.193	55	2.165	0.7	.028	4.0	.157	1
					3	Ext.	▲	MWE0400MA	27.7	1.091	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	4.0	.157	1
					3	Int.	▲	MWS0400MB	32.7	1.287	32.7	1.287	80.7	3.177	80	3.150	0.7	.028	4.0	.157	6
					5	Int.	▲	MWS0400LB	44.7	1.760	44.7	1.760	92.7	3.650	92	3.622	0.7	.028	4.0	.157	6
					8	Int.	▲	MWS0400X8DB	46.7	1.839	46.7	1.839	92.7	3.650	92	3.622	0.7	.028	4.0	.157	6
					10	Int.	●	MWS0400X10DB	52.7	2.075	55.7	2.193	103.7	4.083	103	4.055	0.7	.028	4.0	.157	7
					15	Int.	●	MWS0400X15DB	72.7	2.862	75.7	2.980	123.7	4.870	123	4.843	0.7	.028	4.0	.157	7
					20	Int.	●	MWS0400X20DB	92.7	3.650	95.7	3.768	143.7	5.657	143	5.630	0.7	.028	4.0	.157	7
					25	Int.	●	MWS0400X25DB	112.7	4.437	115.7	4.555	163.7	6.445	163	6.417	0.7	.028	4.0	.157	7
					30	Int.	●	MWS0400X30DB	132.7	5.224	135.7	5.343	183.7	7.232	183	7.205	0.7	.028	4.0	.157	7
4.039	.1590		21	#10-32	5	Int.	▲	MWS01590LB	50.7	1.996	50.7	1.996	100.7	3.965	100	3.937	0.7	.028	5.0	.197	6
					8	Int.	▲	MWS01590X8DB	50.7	1.996	50.7	1.996	100.7	3.965	100	3.937	0.7	.028	5.0	.197	6
					15	Int.	●	MWS01590X15DB	81.7	3.217	84.7	3.335	134.7	5.303	134	5.276	0.7	.028	5.0	.197	7
					20	Int.	●	MWS01590X20DB	104.7	4.122	107.7	4.240	157.7	6.209	157	6.181	0.7	.028	5.0	.197	7
					25	Int.	●	MWS01590X25DB	126.7	4.988	129.7	5.106	179.7	7.075	179	7.047	0.7	.028	5.0	.197	7
					30	Int.	●	MWS01590X30DB	149.7	5.894	152.7	6.012	202.7	7.980	202	7.953	0.7	.028	5.0	.197	7
4.100	.1614				2	Ext.	▲	MWE0410SA	22.8	.898	22.8	.898	55.8	2.197	55	2.165	0.8	.031	4.1	.161	1
					3	Ext.	▲	MWE0410MA	29.8	1.173	29.8	1.173	63.8	2.512	63	2.480	0.8	.031	4.1	.161	1
					3	Int.	▲	MWS0410MB	36.8	1.449	36.8	1.449	86.8	3.417	86	3.386	0.8	.031	5.0	.197	6
					5	Int.	▲	MWS0410LB	50.8	2.000	50.8	2.000	100.8	3.969	100	3.937	0.8	.031	5.0	.197	6
					8	Int.	▲	MWS0410X8DB	52.8	2.079	52.8	2.079	100.8	3.969	100	3.937	0.8	.031	5.0	.197	6
					10	Int.	●	MWS0410X10DB	59.8	2.354	62.8	2.472	112.8	4.441	112	4.409	0.8	.031	5.0	.197	7
					15	Int.	●	MWS0410X15DB	81.8	3.220	84.8	3.339	134.8	5.307	134	5.276	0.8	.031	5.0	.197	7
					20	Int.	●	MWS0410X20DB	104.8	4.126	107.8	4.244	157.8	6.213	157	6.181	0.8	.031	5.0	.197	7
					25	Int.	★	MWS0410X25DB	126.8	4.992	129.8	5.110	179.8	7.079	179	7.047	0.8	.031	5.0	.197	7
					30	Int.	●	MWS0410X30DB	149.8	5.898	152.8	6.016	202.8	7.984	202	7.953	0.8	.031	5.0	.197	7
4.200	.1654			M5x0.8	2	Ext.	▲	MWE0420SA	22.8	.898	22.8	.898	55.8	2.197	55	2.165	0.8	.031	4.2	.165	1
					3	Ext.	▲	MWE0420MA	29.8	1.173	29.8	1.173	63.8	2.512	63	2.480	0.8	.031	4.2	.165	1
					3	Int.	▲	MWS0420MB	36.8	1.449	36.8	1.449	86.8	3.417	86	3.386	0.8	.031	5.0	.197	6
					5	Int.	▲	MWS0420LB	50.8	2.000	50.8	2.000	100.8	3.969	100	3.937	0.8	.031	5.0	.197	6
					8	Int.	▲	MWS0420X8DB	52.8	2.079	52.8	2.079	100.8	3.969	100	3.937	0.8	.031	5.0	.197	6
					10	Int.	●	MWS0420X10DB	59.8	2.354	62.8	2.472	112.8	4.441	112	4.409	0.8	.031	5.0	.197	7
					15	Int.	●	MWS0420X15DB	81.8	3.220	84.8	3.339	134.8	5.307	134	5.276	0.8	.031	5.0	.197	7
					20	Int.	★	MWS0420X20DB	104.8	4.126	107.8	4.244	157.8	6.213	157	6.181	0.8	.031	5.0	.197	7
					25	Int.	★	MWS0420X25DB	126.8	4.992	129.8	5.110	179.8	7.079	179	7.047	0.8	.031	5.0	.197	7
					30	Int.	★	MWS0420X30DB	149.8	5.898	152.8	6.016	202.8	7.984	202	7.953	0.8	.031	5.0	.197	7

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

▲ : This item to be discontinued within two years.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.300	.1693				2	Ext.	▲	MWE0430SA	24.8	.976	24.8	.976	58.8	2.315	58	2.283	0.8	.031	4.3	.169	1
					3	Ext.	▲	MWE0430MA	29.8	1.173	29.8	1.173	63.8	2.512	63	2.480	0.8	.031	4.3	.169	1
					3	Int.	▲	MWS0430MB	36.8	1.449	36.8	1.449	86.8	3.417	86	3.386	0.8	.031	5.0	.197	6
					5	Int.	▲	MWS0430LB	50.8	2.000	50.8	2.000	100.8	3.969	100	3.937	0.8	.031	5.0	.197	6
					8	Int.	▲	MWS0430X8DB	52.8	2.079	52.8	2.079	100.8	3.969	100	3.937	0.8	.031	5.0	.197	6
					8	Int.	▲	MWS01693X8DB	50.8	2.000	50.8	2.000	100.8	3.969	100	3.937	0.8	.031	5.0	.197	6
					10	Int.	●	MWS0430X10DB	59.8	2.354	62.8	2.472	112.8	4.441	112	4.409	0.8	.031	5.0	.197	7
					15	Int.	●	MWS0430X15DB	81.8	3.220	84.8	3.339	134.8	5.307	134	5.276	0.8	.031	5.0	.197	7
					15	Int.	●	MWS01693X15DB	81.8	3.220	84.8	3.339	134.8	5.307	134	5.276	0.8	.031	5.0	.197	7
					20	Int.	●	MWS0430X20DB	104.8	4.126	107.8	4.244	157.8	6.213	157	6.181	0.8	.031	5.0	.197	7
					20	Int.	●	MWS01693X20DB	104.8	4.126	107.8	4.244	157.8	6.213	157	6.181	0.8	.031	5.0	.197	6
					25	Int.	★	MWS0430X25DB	126.8	4.992	129.8	5.110	179.8	7.079	179	7.047	0.8	.031	5.0	.197	7
					25	Int.	●	MWS01693X25DB	126.8	4.992	129.8	5.110	179.8	7.079	179	7.047	0.8	.031	5.0	.197	7
					30	Int.	★	MWS0430X30DB	149.8	5.898	152.8	6.016	202.8	7.984	202	7.953	0.8	.031	5.0	.197	7
					30	Int.	●	MWS01693X30DB	149.8	5.898	152.8	6.016	202.8	7.984	202	7.953	0.8	.031	5.0	.197	7
4.366	.1719	11/64			5	Int.	▲	MWS01719LB	50.8	2.000	50.8	2.000	100.8	3.969	100	3.937	0.8	.031	5.0	.197	6
					8	Int.	▲	MWS01719X8DB	50.8	2.000	50.8	2.000	100.8	3.969	100	3.937	0.8	.031	5.0	.197	6
					15	Int.	●	MWS01719X15DB	81.8	3.220	84.8	3.339	134.8	5.307	134	5.276	0.8	.031	5.0	.197	7
					20	Int.	●	MWS01719X20DB	104.8	4.126	107.8	4.244	157.8	6.213	157	6.181	0.8	.031	5.0	.197	7
					25	Int.	●	MWS01719X25DB	126.8	4.992	129.8	5.110	179.8	7.079	179	7.047	0.8	.031	5.0	.197	7
					30	Int.	●	MWS01719X30DB	149.8	5.898	152.8	6.016	202.8	7.984	202	7.953	0.8	.031	5.0	.197	7
4.400	.1732		17		2	Ext.	▲	MWE0440SA	24.8	.976	24.8	.976	58.8	2.315	58	2.283	0.8	.031	4.4	.173	1
					3	Ext.	▲	MWE0440MA	29.8	1.173	29.8	1.173	63.8	2.512	63	2.480	0.8	.031	4.4	.173	1
					3	Int.	▲	MWS0440MB	36.8	1.449	36.8	1.449	86.8	3.417	86	3.386	0.8	.031	5.0	.197	6
					5	Int.	▲	MWS0440LB	50.8	2.000	50.8	2.000	100.8	3.969	100	3.937	0.8	.031	5.0	.197	6
					8	Int.	▲	MWS0440X8DB	52.8	2.079	52.8	2.079	100.8	3.969	100	3.937	0.8	.031	5.0	.197	6
					10	Int.	★	MWS0440X10DB	59.8	2.354	62.8	2.472	112.8	4.441	112	4.409	0.8	.031	5.0	.197	7
					15	Int.	●	MWS0440X15DB	81.8	3.220	84.8	3.339	134.8	5.307	134	5.276	0.8	.031	5.0	.197	7
					20	Int.	●	MWS0440X20DB	104.8	4.126	107.8	4.244	157.8	6.213	157	6.181	0.8	.031	5.0	.197	7
					25	Int.	★	MWS0440X25DB	126.8	4.992	129.8	5.110	179.8	7.079	179	7.047	0.8	.031	5.0	.197	7
					30	Int.	★	MWS0440X30DB	149.8	5.898	152.8	6.016	202.8	7.984	202	7.953	0.8	.031	5.0	.197	7
4.500	.1772		16	#12-24	2	Ext.	▲	MWE0450SA	24.8	.976	24.8	.976	58.8	2.315	58	2.283	0.8	.031	4.5	.177	1
					3	Ext.	▲	MWE0450MA	29.8	1.173	29.8	1.173	63.8	2.512	63	2.480	0.8	.031	4.5	.177	1
					3	Int.	▲	MWS0450MB	36.8	1.449	36.8	1.449	86.8	3.417	86	3.386	0.8	.031	5.0	.197	6
					5	Int.	▲	MWS0450LB	50.8	2.000	50.8	2.000	100.8	3.969	100	3.937	0.8	.031	5.0	.197	6
					8	Int.	▲	MWS0450X8DB	52.8	2.079	52.8	2.079	100.8	3.969	100	3.937	0.8	.031	5.0	.197	6
					10	Int.	●	MWS0450X10DB	59.8	2.354	62.8	2.472	112.8	4.441	112	4.409	0.8	.031	5.0	.197	7
					15	Int.	●	MWS0450X15DB	81.8	3.220	84.8	3.339	134.8	5.307	134	5.276	0.8	.031	5.0	.197	7
					20	Int.	●	MWS0450X20DB	104.8	4.126	107.8	4.244	157.8	6.213	157	6.181	0.8	.031	5.0	.197	7
					25	Int.	●	MWS0450X25DB	126.8	4.992	129.8	5.110	179.8	7.079	179	7.047	0.8	.031	5.0	.197	7
					30	Int.	●	MWS0450X30DB	149.8	5.898	152.8	6.016	202.8	7.984	202	7.953	0.8	.031	5.0	.197	7

DRILLING

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.600	.1811				2	Ext.	▲	MWE0460SA	24.8	.976	24.8	.976	58.8	2.315	58	2.283	0.8	.031	4.6	.181	1
					3	Ext.	▲	MWE0460MA	32.8	1.291	32.8	1.291	68.8	2.709	68	2.677	0.8	.031	4.6	.181	1
					3	Int.	▲	MWS0460MB	40.8	1.606	40.8	1.606	90.8	3.575	90	3.543	0.8	.031	5.0	.197	6
					5	Int.	▲	MWS0460LB	55.8	2.197	55.8	2.197	105.8	4.165	105	4.134	0.8	.031	5.0	.197	6
					8	Int.	▲	MWS0460X8DB	57.8	2.276	57.8	2.276	105.8	4.165	105	4.134	0.8	.031	5.0	.197	6
					10	Int.	●	MWS0460X10DB	65.8	2.591	68.8	2.709	118.8	4.677	118	4.646	0.8	.031	5.0	.197	7
					15	Int.	●	MWS0460X15DB	90.8	3.575	93.8	3.693	143.8	5.661	143	5.630	0.8	.031	5.0	.197	7
					20	Int.	●	MWS0460X20DB	115.8	4.559	118.8	4.677	168.8	6.646	168	6.614	0.8	.031	5.0	.197	7
					25	Int.	●	MWS0460X25DB	126.8	4.992	143.8	5.661	179.8	7.079	179	7.047	0.8	.031	5.0	.197	7
					30	Int.	★	MWS0460X30DB	165.8	6.528	168.8	6.646	218.8	8.614	218	8.583	0.8	.031	5.0	.197	7
4.700	.1850		13		2	Ext.	▲	MWE0470SA	24.9	.980	24.9	.980	58.9	2.319	58	2.283	0.9	.035	4.7	.185	1
					3	Ext.	▲	MWE0470MA	32.9	1.295	32.9	1.295	68.9	2.713	68	2.677	0.9	.035	4.7	.185	1
					3	Int.	▲	MWS0470MB	40.9	1.610	40.9	1.610	90.9	3.579	90	3.543	0.9	.035	5.0	.197	6
					5	Int.	▲	MWS0470LB	55.9	2.201	55.9	2.201	105.9	4.169	105	4.134	0.9	.035	5.0	.197	6
					8	Int.	▲	MWS0470X8DB	57.9	2.280	57.9	2.280	105.9	4.169	105	4.134	0.9	.035	5.0	.197	6
					10	Int.	★	MWS0470X10DB	65.9	2.594	68.9	2.713	118.9	4.681	118	4.646	0.9	.035	5.0	.197	7
					15	Int.	★	MWS0470X15DB	90.9	3.579	93.9	3.697	143.9	5.665	143	5.630	0.9	.035	5.0	.197	7
					20	Int.	★	MWS0470X20DB	115.9	4.563	118.9	4.681	168.9	6.650	168	6.614	0.9	.035	5.0	.197	7
					25	Int.	★	MWS0470X25DB	140.9	5.547	143.9	5.665	193.9	7.634	193	7.598	0.9	.035	5.0	.197	7
					30	Int.	★	MWS0470X30DB	165.9	6.531	168.9	6.650	218.9	8.618	218	8.583	0.9	.035	5.0	.197	7
4.763	.1875	3/16			5	Int.	▲	MWS01875LB	55.9	2.201	55.9	2.201	105.9	4.169	105	4.134	0.9	.035	5.0	.197	6
					8	Int.	▲	MWS01875X8DB	55.9	2.201	55.9	2.201	105.9	4.169	105	4.134	0.9	.035	5.0	.197	6
					15	Int.	●	MWS01875X15DB	90.9	3.579	93.9	3.697	143.9	5.665	143	5.630	0.9	.035	5.0	.197	7
					20	Int.	●	MWS01875X20DB	115.9	4.563	118.9	4.681	168.9	6.650	168	6.614	0.9	.035	5.0	.197	7
					25	Int.	●	MWS01875X25DB	140.9	5.547	143.9	5.665	193.9	7.634	193	7.598	0.9	.035	5.0	.197	7
					30	Int.	●	MWS01875X30DB	165.9	6.531	168.9	6.650	218.9	8.618	218	8.583	0.9	.035	5.0	.197	7
4.800	.1890		12		2	Ext.	▲	MWE0480SA	26.9	1.059	26.9	1.059	62.9	2.476	62	2.441	0.9	.035	4.8	.189	1
					3	Ext.	▲	MWE0480MA	32.9	1.295	32.9	1.295	68.9	2.713	68	2.677	0.9	.035	4.8	.189	1
					3	Int.	▲	MWS0480MB	40.9	1.610	40.9	1.610	90.9	3.579	90	3.543	0.9	.035	5.0	.197	6
					5	Int.	▲	MWS0480LB	55.9	2.201	55.9	2.201	105.9	4.169	105	4.134	0.9	.035	5.0	.197	6
					8	Int.	▲	MWS0480X8DB	57.9	2.280	57.9	2.280	105.9	4.169	105	4.134	0.9	.035	5.0	.197	6
					10	Int.	★	MWS0480X10DB	65.9	2.594	68.9	2.713	118.9	4.681	118	4.646	0.9	.035	5.0	.197	7
					15	Int.	●	MWS0480X15DB	90.9	3.579	93.9	3.697	143.9	5.665	143	5.630	0.9	.035	5.0	.197	7
					20	Int.	★	MWS0480X20DB	115.9	4.563	118.9	4.681	168.9	6.650	168	6.614	0.9	.035	5.0	.197	7
					25	Int.	★	MWS0480X25DB	140.9	5.547	143.9	5.665	193.9	7.634	193	7.598	0.9	.035	5.0	.197	7
					30	Int.	●	MWS0480X30DB	165.9	6.531	168.9	6.650	218.9	8.618	218	8.583	0.9	.035	5.0	.197	7
4.900	.1929				2	Ext.	▲	MWE0490SA	26.9	1.059	26.9	1.059	62.9	2.476	62	2.441	0.9	.035	4.9	.193	1
					3	Ext.	▲	MWE0490MA	32.9	1.295	32.9	1.295	68.9	2.713	68	2.677	0.9	.035	4.9	.193	1
					3	Int.	▲	MWS0490MB	40.9	1.610	40.9	1.610	90.9	3.579	90	3.543	0.9	.035	5.0	.197	6
					5	Int.	▲	MWS0490LB	55.9	2.201	55.9	2.201	105.9	4.169	105	4.134	0.9	.035	5.0	.197	6
					8	Int.	▲	MWS0490X8DB	57.9	2.280	57.9	2.280	105.9	4.169	105	4.134	0.9	.035	5.0	.197	6
					10	Int.	●	MWS0490X10DB	65.9	2.594	68.9	2.713	118.9	4.681	118	4.646	0.9	.035	5.0	.197	7
					15	Int.	●	MWS0490X15DB	90.9	3.579	93.9	3.697	143.9	5.665	143	5.630	0.9	.035	5.0	.197	7
					20	Int.	★	MWS0490X20DB	115.9	4.563	118.9	4.681	168.9	6.650	168	6.614	0.9	.035	5.0	.197	7
					25	Int.	★	MWS0490X25DB	140.9	5.547	143.9	5.665	193.9	7.634	193	7.598	0.9	.035	5.0	.197	7
					30	Int.	★	MWS0490X30DB	165.9	6.531	168.9	6.650	218.9	8.618	218	8.583	0.9	.035	5.0	.197	7

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

▲ : This item to be discontinued within two years.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
5.000	.1969			M6x10	2	Ext.	▲	MWE0500SA	26.9	1.059	26.9	1.059	62.9	2.476	62	2.441	0.9	.035	5.0	.197	1
					3	Ext.	▲	MWE0500MA	32.9	1.295	32.9	1.295	68.9	2.713	68	2.677	0.9	.035	5.0	.197	1
					3	Int.	▲	MWS0500MB	28.4	1.118	30.9	1.217	82.9	3.264	82	3.228	0.9	.035	6.0	.236	6
					5	Int.	▲	MWS0500LB	44.9	1.768	48.9	1.925	100.9	3.972	100	3.937	0.9	.035	6.0	.236	6
					8	Int.	▲	MWS0500X8DB	57.9	2.280	57.9	2.280	105.9	4.169	105	4.134	0.9	.035	5.0	.197	6
					10	Int.	●	MWS0500X10DB	65.9	2.594	68.9	2.713	118.9	4.681	118	4.646	0.9	.035	5.0	.197	7
					15	Int.	●	MWS0500X15DB	90.9	3.579	93.9	3.697	143.9	5.665	143	5.630	0.9	.035	5.0	.197	7
					20	Int.	●	MWS0500X20DB	115.9	4.563	118.9	4.681	168.9	6.650	168	6.614	0.9	.035	5.0	.197	7
					25	Int.	●	MWS0500X25DB	140.9	5.547	143.9	5.665	193.9	7.634	193	7.598	0.9	.035	5.0	.197	7
					30	Int.	●	MWS0500X30DB	165.9	6.531	168.9	6.650	218.9	8.618	218	8.583	0.9	.035	5.0	.197	7
5.100	.2008		7	1/4-20	2	Ext.	▲	MWE0510SA	26.9	1.059	26.9	1.059	62.9	2.476	62	2.441	0.9	.035	5.1	.201	1
					3	Ext.	▲	MWE0510MA	34.9	1.374	34.9	1.374	72.9	2.870	72	2.835	0.9	.035	5.1	.201	1
					3	Int.	▲	MWS0510MB	28.4	1.118	30.9	1.217	82.9	3.264	82	3.228	0.9	.035	6.0	.236	6
					5	Int.	▲	MWS0510LB	44.9	1.768	48.9	1.925	100.9	3.972	100	3.937	0.9	.035	6.0	.236	6
					8	Int.	▲	MWS0510X8DB	61.9	2.437	66.9	2.634	118.9	4.681	118	4.646	0.9	.035	6.0	.236	6
					10	Int.	★	MWS0510X10DB	72.9	2.870	75.9	2.988	127.9	5.035	127	5.000	0.9	.035	6.0	.236	6
					15	Int.	●	MWS0510X15DB	99.9	3.933	102.9	4.051	154.9	6.098	154	6.063	0.9	.035	6.0	.236	7
					20	Int.	●	MWS0510X20DB	127.9	5.035	130.9	5.154	182.9	7.201	182	7.165	0.9	.035	6.0	.236	7
					25	Int.	★	MWS0510X25DB	154.9	6.098	157.9	6.217	209.9	8.264	209	8.228	0.9	.035	6.0	.236	7
					30	Int.	★	MWS0510X30DB	182.9	7.201	185.9	7.319	237.9	9.366	237	9.331	0.9	.035	6.0	.236	7
5.159	.2031	13/64			5	Int.	▲	MWS02031LB	44.9	1.768	48.9	1.925	100.9	3.972	100	3.937	0.9	.035	5.954	.234	6
					8	Int.	▲	MWS02031X8DB	61.9	2.437	66.9	2.634	118.9	4.681	118	4.646	0.9	.035	5.954	.234	6
					15	Int.	●	MWS02031X15DB	99.9	3.933	102.9	4.051	154.9	6.098	154	6.063	0.9	.035	5.954	.234	7
					20	Int.	●	MWS02031X20DB	127.9	5.035	130.9	5.154	182.9	7.201	182	7.165	0.9	.035	5.954	.234	7
					25	Int.	●	MWS02031X25DB	154.9	6.098	157.9	6.217	209.9	8.264	209	8.228	0.9	.035	5.954	.234	7
					30	Int.	●	MWS02031X30DB	182.9	7.201	185.9	7.319	237.9	9.366	237	9.331	0.9	.035	5.954	.234	7
5.200	.2047				2	Ext.	▲	MWE0520SA	27.0	1.063	27.0	1.063	63.0	2.480	62	2.441	1.0	.039	5.2	.205	1
					3	Ext.	▲	MWE0520MA	35.0	1.378	35.0	1.378	73.0	2.874	72	2.835	1.0	.039	5.2	.205	1
					3	Int.	▲	MWS0520MB	28.5	1.122	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6.0	.236	6
					5	Int.	▲	MWS0520LB	45.0	1.772	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6.0	.236	6
					8	Int.	▲	MWS0520X8DB	62.0	2.441	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6.0	.236	6
					10	Int.	●	MWS0520X10DB	73.0	2.874	76.0	2.992	128.0	5.039	127	5.000	1.0	.039	6.0	.236	7
					15	Int.	●	MWS0520X15DB	100.0	3.937	103.0	4.055	155.0	6.102	154	6.063	1.0	.039	6.0	.236	7
					20	Int.	★	MWS0520X20DB	128.0	5.039	131.0	5.157	183.0	7.205	182	7.165	1.0	.039	6.0	.236	7
					25	Int.	★	MWS0520X25DB	155.0	6.102	158.0	6.220	210.0	8.268	209	8.228	1.0	.039	6.0	.236	7
					30	Int.	★	MWS0520X30DB	183.0	7.205	186.0	7.323	238.0	9.370	237	9.331	1.0	.039	6.0	.236	7
5.300	.2087		4		2	Ext.	▲	MWE0530SA	27.0	1.063	27.0	1.063	63.0	2.480	62	2.441	1.0	.039	5.3	.209	1
					3	Ext.	▲	MWE0530MA	35.0	1.378	35.0	1.378	73.0	2.874	72	2.835	1.0	.039	5.3	.209	1
					3	Int.	▲	MWS0530MB	28.5	1.122	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6.0	.236	6
					5	Int.	▲	MWS0530LB	45.0	1.772	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6.0	.236	6
					8	Int.	▲	MWS0530X8DB	62.0	2.441	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6.0	.236	6
					10	Int.	●	MWS0530X10DB	73.0	2.874	76.0	2.992	128.0	5.039	127	5.000	1.0	.039	6.0	.236	7
					15	Int.	●	MWS0530X15DB	100.0	3.937	103.0	4.055	155.0	6.102	154	6.063	1.0	.039	6.0	.236	7
					20	Int.	●	MWS0530X20DB	128.0	5.039	131.0	5.157	183.0	7.205	182	7.165	1.0	.039	6.0	.236	7
					25	Int.	●	MWS0530X25DB	155.0	6.102	158.0	6.220	210.0	8.268	209	8.228	1.0	.039	6.0	.236	7
					30	Int.	★	MWS0530X30DB	183.0	7.205	186.0	7.323	238.0	9.370	237	9.331	1.0	.039	6.0	.236	7

CUTTING CONDITIONS ➤ L088
HOW TO USE ➤ L094
TECHNICAL DATA ➤ N001

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
5.400	.2126				2	Ext.	▲	MWE0540SA	29.0	1.142	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	5.4	.213	1
					3	Ext.	▲	MWE0540MA	35.0	1.378	35.0	1.378	73.0	2.874	72	2.835	1.0	.039	5.4	.213	1
					3	Int.	▲	MWS0540MB	28.5	1.122	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6.0	.236	6
					5	Int.	▲	MWS0540LB	45.0	1.772	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6.0	.236	6
					8	Int.	▲	MWS0540X8DB	62.0	2.441	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6.0	.236	6
					10	Int.	●	MWS0540X10DB	73.0	2.874	76.0	2.992	128.0	5.039	127	5.000	1.0	.039	6.0	.236	7
					15	Int.	●	MWS0540X15DB	100.0	3.937	103.0	4.055	155.0	6.102	154	6.063	1.0	.039	6.0	.236	7
					20	Int.	★	MWS0540X20DB	128.0	5.039	131.0	5.157	183.0	7.205	182	7.165	1.0	.039	6.0	.236	6
					25	Int.	★	MWS0540X25DB	155.0	6.102	158.0	6.220	210.0	8.268	209	8.228	1.0	.039	6.0	.236	7
					30	Int.	★	MWS0540X30DB	183.0	7.205	186.0	7.323	238.0	9.370	237	9.331	1.0	.039	6.0	.236	7
5.410	.2130		3	1/4-28	8	Int.	▲	MWS02130X8DB	62.0	2.441	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	5.954	.234	6
					15	Int.	●	MWS02130X15DB	100.0	3.937	103.0	4.055	155.0	6.102	154	6.063	1.0	.039	5.954	.234	7
					20	Int.	●	MWS02130X20DB	128.0	5.039	131.0	5.157	183.0	7.205	182	7.165	1.0	.039	5.954	.234	7
					25	Int.	●	MWS02130X25DB	155.0	6.102	158.0	6.220	210.0	8.268	209	8.228	1.0	.039	5.954	.234	7
					30	Int.	●	MWS02130X30DB	183.0	7.205	186.0	7.323	238.0	9.370	237	9.331	1.0	.039	5.954	.234	7
5.500	.2165				2	Ext.	▲	MWE0550SA	29.0	1.142	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	5.5	.217	1
					3	Ext.	▲	MWE0550MA	35.0	1.378	35.0	1.378	73.0	2.874	72	2.835	1.0	.039	5.5	.217	1
					3	Int.	▲	MWS0550MB	28.5	1.122	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6.0	.236	6
					5	Int.	▲	MWS0550LB	45.0	1.772	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6.0	.236	6
					8	Int.	▲	MWS0550X8DB	62.0	2.441	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6.0	.236	6
					10	Int.	●	MWS0550X10DB	73.0	2.874	76.0	2.992	128.0	5.039	127	5.000	1.0	.039	6.0	.236	7
					15	Int.	●	MWS0550X15DB	100.0	3.937	103.0	4.055	155.0	6.102	154	6.063	1.0	.039	6.0	.236	7
					20	Int.	●	MWS0550X20DB	128.0	5.039	131.0	5.157	183.0	7.205	182	7.165	1.0	.039	6.0	.236	7
					25	Int.	●	MWS0550X25DB	155.0	6.102	158.0	6.220	210.0	8.268	209	8.228	1.0	.039	6.0	.236	7
					30	Int.	●	MWS0550X30DB	183.0	7.205	186.0	7.323	238.0	9.370	237	9.331	1.0	.039	6.0	.236	7
5.558	.2188	7/32			5	Int.	▲	MWS02188LB	49.0	1.929	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	5.954	.234	6
					8	Int.	▲	MWS02188X8DB	67.0	2.638	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	5.954	.234	6
					15	Int.	●	MWS02188X15DB	109.0	4.291	112.0	4.409	164.0	6.457	163	6.417	1.0	.039	5.954	.234	7
					20	Int.	●	MWS02188X20DB	139.0	5.472	142.0	5.591	194.0	7.638	193	7.598	1.0	.039	5.954	.234	7
					25	Int.	●	MWS02188X25DB	169.0	6.654	172.0	6.772	224.0	8.819	223	8.780	1.0	.039	5.954	.234	7
					30	Int.	●	MWS02188X30DB	199.0	7.835	202.0	7.953	254.0	10.000	253	9.961	1.0	.039	5.954	.234	7
5.600	.2205		2		2	Ext.	▲	MWE0560SA	29.0	1.142	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	5.6	.220	1
					3	Ext.	▲	MWE0560MA	37.0	1.457	37.0	1.457	75.0	2.953	74	2.913	1.0	.039	5.6	.220	1
					3	Int.	▲	MWS0560MB	31.0	1.220	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6.0	.236	6
					5	Int.	▲	MWS0560LB	49.0	1.929	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6.0	.236	6
					8	Int.	▲	MWS0560X8DB	67.0	2.638	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6.0	.236	6
					10	Int.	★	MWS0560X10DB	79.0	3.110	82.0	3.228	134.0	5.276	133	5.236	1.0	.039	6.0	.236	7
					15	Int.	★	MWS0560X15DB	109.0	4.291	112.0	4.409	164.0	6.457	163	6.417	1.0	.039	6.0	.236	7
					20	Int.	★	MWS0560X20DB	139.0	5.472	142.0	5.591	194.0	7.638	193	7.598	1.0	.039	6.0	.236	7
					25	Int.	★	MWS0560X25DB	a.0	6.654	172.0	6.772	224.0	8.819	223	8.780	1.0	.039	6.0	.236	7
					30	Int.	★	MWS0560X30DB	199.0	7.835	202.0	7.953	254.0	10.000	253	9.961	1.0	.039	6.0	.236	7

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● : Inventory maintained. ★ : Inventory maintained in Japan.

▲ : This item to be discontinued within two years.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
5.700	.2244				2	Ext.	▲	MWE0570SA	29.0	1.142	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	5.7	.224	1
					3	Ext.	▲	MWE0570MA	37.0	1.457	37.0	1.457	75.0	2.953	74	2.913	1.0	.039	5.7	.224	1
					3	Int.	▲	MWS0570MB	31.0	1.220	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6.0	.236	6
					5	Int.	▲	MWS0570LB	49.0	1.929	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6.0	.236	6
					8	Int.	▲	MWS0570X8DB	67.0	2.638	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6.0	.236	6
					10	Int.	●	MWS0570X10DB	79.0	3.110	82.0	3.228	134.0	5.276	133	5.236	1.0	.039	6.0	.236	7
					15	Int.	●	MWS0570X15DB	109.0	4.291	112.0	4.409	164.0	6.457	163	6.417	1.0	.039	6.0	.236	7
					20	Int.	●	MWS0570X20DB	139.0	5.472	142.0	5.591	194.0	7.638	193	7.598	1.0	.039	6.0	.236	7
					25	Int.	●	MWS0570X25DB	169.0	6.654	172.0	6.772	224.0	8.819	223	8.780	1.0	.039	6.0	.236	7
					30	Int.	★	MWS0570X30DB	199.0	7.835	202.0	7.953	254.0	10.000	253	9.961	1.0	.039	6.0	.236	7
5.800	.2283		1		2	Ext.	▲	MWE0580SA	29.1	1.146	29.1	1.146	67.1	2.642	66	2.598	1.1	.043	5.8	.228	1
					3	Ext.	▲	MWE0580MA	37.1	1.461	37.1	1.461	75.1	2.957	74	2.913	1.1	.043	5.8	.228	1
					3	Int.	▲	MWS0580MB	31.1	1.224	31.1	1.224	83.1	3.272	82	3.228	1.1	.043	6.0	.236	6
					5	Int.	▲	MWS0580LB	49.1	1.933	49.1	1.933	101.1	3.980	100	3.937	1.1	.043	6.0	.236	6
					8	Int.	▲	MWS0580X8DB	67.1	2.642	67.1	2.642	119.1	4.689	118	4.646	1.1	.043	6.0	.236	7
					10	Int.	●	MWS0580X10DB	79.1	3.114	82.1	3.232	134.1	5.280	133	5.236	1.1	.043	6.0	.236	7
					15	Int.	★	MWS0580X15DB	109.1	4.295	112.1	4.413	164.1	6.461	163	6.417	1.1	.043	6.0	.236	7
					20	Int.	●	MWS0580X20DB	139.1	5.476	142.1	5.594	194.1	7.642	193	7.598	1.1	.043	6.0	.236	7
					25	Int.	★	MWS0580X25DB	169.1	6.657	172.1	6.776	224.1	8.823	223	8.780	1.1	.043	6.0	.236	7
					30	Int.	★	MWS0580X30DB	199.1	7.839	202.1	7.957	254.1	10.004	253	9.961	1.1	.043	6.0	.236	7
5.900	.2323				2	Ext.	▲	MWE0590SA	29.1	1.146	29.1	1.146	67.1	2.642	66	2.598	1.1	.043	5.9	.232	1
					3	Ext.	▲	MWE0590MA	37.1	1.461	37.1	1.461	75.1	2.957	74	2.913	1.1	.043	5.9	.232	1
					3	Int.	▲	MWS0590MB	31.1	1.224	31.1	1.224	83.1	3.272	82	3.228	1.1	.043	6.0	.236	6
					5	Int.	▲	MWS0590LB	49.1	1.933	49.1	1.933	101.1	3.980	100	3.937	1.1	.043	6.0	.236	6
					8	Int.	▲	MWS0590X8DB	67.1	2.642	67.1	2.642	119.1	4.689	118	4.646	1.1	.043	6.0	.236	6
					10	Int.	★	MWS0590X10DB	79.1	3.114	82.1	3.232	134.1	5.280	133	5.236	1.1	.043	6.0	.236	7
					15	Int.	★	MWS0590X15DB	109.1	4.295	112.1	4.413	164.1	6.461	163	6.417	1.1	.043	6.0	.236	7
					20	Int.	★	MWS0590X20DB	139.1	5.476	142.1	5.594	194.1	7.642	193	7.598	1.1	.043	6.0	.236	7
					25	Int.	★	MWS0590X25DB	169.1	6.657	172.1	6.776	224.1	8.823	223	8.780	1.1	.043	6.0	.236	7
					30	Int.	★	MWS0590X30DB	199.1	7.839	202.1	7.957	254.1	10.004	253	9.961	1.1	.043	6.0	.236	7
5.954	.2344	15/64	A		5	Int.	▲	MWS02344LB	49.1	1.933	49.1	1.933	101.1	3.980	100	3.937	1.1	.043	5.954	.234	6
					8	Int.	▲	MWS02344X8DB	67.1	2.642	67.1	2.642	119.1	4.689	118	4.646	1.1	.043	5.954	.234	6
					15	Int.	●	MWS02344X15DB	109.1	4.295	112.1	4.413	164.1	6.461	163	6.417	1.1	.043	5.954	.234	7
					20	Int.	●	MWS02344X20DB	139.1	5.476	142.1	5.594	194.1	7.642	193	7.598	1.1	.043	5.954	.234	7
					25	Int.	●	MWS02344X25DB	169.1	6.657	172.1	6.776	224.1	8.823	223	8.780	1.1	.043	5.954	.234	7
					30	Int.	●	MWS02344X30DB	199.1	7.839	202.1	7.957	254.1	10.004	253	9.961	1.1	.043	5.954	.234	7
6.000	.2362			M7x1.0	2	Ext.	▲	MWE0600SA	29.1	1.146	29.1	1.146	67.1	2.642	66	2.598	1.1	.043	6.0	.236	1
					3	Ext.	▲	MWE0600MA	42.1	1.657	42.1	1.657	82.1	3.232	81	3.189	1.1	.043	6.0	.236	1
					3	Int.	▲	MWS0600MB	31.1	1.224	31.1	1.224	83.1	3.272	82	3.228	1.1	.043	6.0	.236	6
					5	Int.	▲	MWS0600LB	49.1	1.933	49.1	1.933	101.1	3.980	100	3.937	1.1	.043	6.0	.236	6
					8	Int.	▲	MWS0600X8DB	67.1	2.642	67.1	2.642	119.1	4.689	118	4.646	1.1	.043	6.0	.236	6
					10	Int.	●	MWS0600X10DB	79.1	3.114	82.1	3.232	134.1	5.280	133	5.236	1.1	.043	6.0	.236	7
					15	Int.	●	MWS0600X15DB	109.1	4.295	112.1	4.413	164.1	6.461	163	6.417	1.1	.043	6.0	.236	7
					20	Int.	●	MWS0600X20DB	139.1	5.476	142.1	5.594	194.1	7.642	193	7.598	1.1	.043	6.0	.236	7
					25	Int.	●	MWS0600X25DB	169.1	6.657	172.1	6.776	224.1	8.823	223	8.780	1.1	.043	6.0	.236	7
					30	Int.	●	MWS0600X30DB	199.1	7.839	202.1	7.957	254.1	10.004	253	9.961	1.1	.043	6.0	.236	7

CUTTING CONDITIONS ➤ L088
HOW TO USE ➤ L094
TECHNICAL DATA ➤ N001

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
6.100	.2402				2	Ext.	▲	MWE0610SA	32.1	1.264	32.1	1.264	71.1	2.799	70	2.756	1.1	.043	6.1	.240	1
					3	Ext.	▲	MWE0610MA	42.1	1.657	42.1	1.657	82.1	3.232	81	3.189	1.1	.043	6.1	.240	1
					3	Int.	▲	MWS0610MB	33.6	1.323	36.1	1.421	89.1	3.508	88	3.465	1.1	.043	7.0	.276	6
					5	Int.	▲	MWS0610LB	53.1	2.091	57.1	2.248	110.1	4.335	109	4.291	1.1	.043	7.0	.276	6
					8	Int.	▲	MWS0610X8DB	73.1	2.878	78.1	3.075	131.1	5.161	130	5.118	1.1	.043	7.0	.276	6
					10	Int.	★	MWS0610X10DB	86.1	3.390	89.1	3.508	142.1	5.594	141	5.551	1.1	.043	7.0	.276	7
					15	Int.	★	MWS0610X15DB	118.1	4.650	121.1	4.768	174.1	6.854	173	6.811	1.1	.043	7.0	.276	7
					20	Int.	★	MWS0610X20DB	151.1	5.949	154.1	6.067	207.1	8.154	206	8.110	1.1	.043	7.0	.276	7
					25	Int.	★	MWS0610X25DB	169.1	6.657	186.1	7.327	224.1	8.823	223	8.780	1.1	.043	7.0	.276	7
					30	Int.	●	MWS0610X30DB	216.1	8.508	219.1	8.626	272.1	10.713	271	10.669	1.1	.043	7.0	.276	7
6.200	.2441				2	Ext.	▲	MWE0620SA	32.1	1.264	32.1	1.264	71.1	2.799	70	2.756	1.1	.043	6.2	.244	1
					3	Ext.	▲	MWE0620MA	42.1	1.657	42.1	1.657	82.1	3.232	81	3.189	1.1	.043	6.2	.244	1
					3	Int.	▲	MWS0620MB	33.6	1.323	36.1	1.421	89.1	3.508	88	3.465	1.1	.043	7.0	.276	6
					5	Int.	▲	MWS0620LB	53.1	2.091	57.1	2.248	110.1	4.335	109	4.291	1.1	.043	7.0	.276	6
					8	Int.	▲	MWS0620X8DB	73.1	2.878	78.1	3.075	131.1	5.161	130	5.118	1.1	.043	7.0	.276	6
					10	Int.	●	MWS0620X10DB	86.1	3.390	89.1	3.508	142.1	5.594	141	5.551	1.1	.043	7.0	.276	7
					15	Int.	●	MWS0620X15DB	118.1	4.650	121.1	4.768	174.1	6.854	173	6.811	1.1	.043	7.0	.276	7
					20	Int.	●	MWS0620X20DB	151.1	5.949	154.1	6.067	207.1	8.154	206	8.110	1.1	.043	7.0	.276	7
					25	Int.	●	MWS0620X25DB	183.1	7.209	186.1	7.327	239.1	9.413	238	9.370	1.1	.043	7.0	.276	7
					30	Int.	●	MWS0620X30DB	216.1	8.508	219.1	8.626	272.1	10.713	271	10.669	1.1	.043	7.0	.276	7
6.300	.2480				2	Ext.	▲	MWE0630SA	32.2	1.268	32.2	1.268	71.2	2.803	70	2.756	1.2	.047	6.3	.248	1
					3	Ext.	▲	MWE0630MA	42.2	1.661	42.2	1.661	82.2	3.236	81	3.189	1.2	.047	6.3	.248	1
					3	Int.	▲	MWS0630MB	33.7	1.327	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7.0	.276	6
					5	Int.	▲	MWS0630LB	53.2	2.094	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7.0	.276	6
					8	Int.	▲	MWS0630X8DB	73.2	2.882	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7.0	.276	6
					10	Int.	●	MWS0630X10DB	86.2	3.394	89.2	3.512	142.2	5.598	141	5.551	1.2	.047	7.0	.276	7
					15	Int.	★	MWS0630X15DB	118.2	4.654	121.2	4.772	174.2	6.858	173	6.811	1.2	.047	7.0	.276	7
					20	Int.	★	MWS0630X20DB	151.2	5.953	154.2	6.071	207.2	8.157	206	8.110	1.2	.047	7.0	.276	7
					25	Int.	★	MWS0630X25DB	183.2	7.213	186.2	7.331	239.2	9.417	238	9.370	1.2	.047	7.0	.276	7
					30	Int.	★	MWS0630X30DB	216.2	8.512	219.2	8.630	272.2	10.717	271	10.669	1.2	.047	7.0	.276	7
6.350	.2500	1/4	E		5	Int.	▲	MWS02500LB	53.2	2.094	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	6.746	.266	6
					8	Int.	▲	MWS02500X8DB	73.2	2.882	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	6.746	.266	6
					15	Int.	●	MWS02500X15DB	118.2	4.654	121.2	4.772	174.2	6.858	173	6.811	1.2	.047	6.746	.266	7
					20	Int.	●	MWS02500X20DB	151.2	5.953	154.2	6.071	207.2	8.157	206	8.110	1.2	.047	6.746	.266	7
					25	Int.	●	MWS02500X25DB	183.2	7.213	186.2	7.331	239.2	9.417	238	9.370	1.2	.047	6.746	.266	7
					30	Int.	●	MWS02500X30DB	216.2	8.512	219.2	8.630	272.2	10.717	271	10.669	1.2	.047	6.746	.266	7
6.400	.2520				2	Ext.	▲	MWE0640SA	32.2	1.268	32.2	1.268	71.2	2.803	70	2.756	1.2	.047	6.4	.252	1
					3	Ext.	▲	MWE0640MA	42.2	1.661	42.2	1.661	82.2	3.236	81	3.189	1.2	.047	6.4	.252	1
					3	Int.	▲	MWS0640MB	33.7	1.327	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7.0	.276	6
					5	Int.	▲	MWS0640LB	53.2	2.094	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7.0	.276	6
					8	Int.	▲	MWS0640X8DB	73.2	2.882	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7.0	.276	6
					10	Int.	●	MWS0640X10DB	86.2	3.394	89.2	3.512	142.2	5.598	141	5.551	1.2	.047	7.0	.276	7
					15	Int.	●	MWS0640X15DB	118.2	4.654	121.2	4.772	174.2	6.858	173	6.811	1.2	.047	7.0	.276	7
					20	Int.	●	MWS0640X20DB	151.2	5.953	154.2	6.071	207.2	8.157	206	8.110	1.2	.047	7.0	.276	7
					25	Int.	●	MWS0640X25DB	183.2	7.213	186.2	7.331	239.2	9.417	238	9.370	1.2	.047	7.0	.276	7
					30	Int.	●	MWS0640X30DB	216.2	8.512	219.2	8.630	272.2	10.717	271	10.669	1.2	.047	7.0	.276	7

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

▲ : This item to be discontinued within two years.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
6.500	.2559				2	Ext.	▲	MWE0650SA	32.2	1.268	32.2	1.268	71.2	2.803	70	2.756	1.2	.047	6.5	.256	1
					3	Ext.	▲	MWE0650MA	42.2	1.661	42.2	1.661	82.2	3.236	81	3.189	1.2	.047	6.5	.256	1
					3	Int.	▲	MWS0650MB	33.7	1.327	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7.0	.276	6
					5	Int.	▲	MWS0650LB	53.2	2.094	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7.0	.276	6
					8	Int.	▲	MWS0650X8DB	73.2	2.882	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7.0	.276	6
					10	Int.	★	MWS0650X10DB	86.2	3.394	89.2	3.512	142.2	5.598	141	5.551	1.2	.047	7.0	.276	7
					15	Int.	★	MWS0650X15DB	118.2	4.654	121.2	4.772	174.2	6.858	173	6.811	1.2	.047	7.0	.276	7
					20	Int.	●	MWS0650X20DB	151.2	5.953	154.2	6.071	207.2	8.157	206	8.110	1.2	.047	7.0	.276	7
					25	Int.	★	MWS0650X25DB	183.2	7.213	186.2	7.331	239.2	9.417	238	9.370	1.2	.047	7.0	.276	7
					30	Int.	●	MWS0650X30DB	216.2	8.512	219.2	8.630	272.2	10.717	271	10.669	1.2	.047	7.0	.276	7
6.528	.2570		F	5/16-18	5	Int.	▲	MWS02570LB	57.2	2.252	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	6.746	.266	6
					8	Int.	▲	MWS02570X8DB	78.2	3.079	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	6.746	.266	6
					15	Int.	●	MWS02570X15DB	127.2	5.008	130.2	5.126	183.2	7.213	182	7.165	1.2	.047	6.746	.266	7
					20	Int.	●	MWS02570X20DB	162.2	6.386	165.2	6.504	218.2	8.591	217	8.543	1.2	.047	6.746	.266	7
					25	Int.	●	MWS02570X25DB	197.2	7.764	200.2	7.882	253.2	9.969	252	9.921	1.2	.047	6.746	.266	7
					30	Int.	●	MWS02570X30DB	232.2	9.142	235.2	9.260	288.2	11.346	287	11.299	1.2	.047	6.746	.266	7
6.600	.2598				2	Ext.	▲	MWE0660SA	32.2	1.268	32.2	1.268	71.2	2.803	70	2.756	1.2	.047	6.6	.260	1
					3	Ext.	▲	MWE0660MA	44.2	1.740	44.2	1.740	84.2	3.315	83	3.268	1.2	.047	6.6	.260	1
					3	Int.	▲	MWS0660MB	36.2	1.425	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7.0	.276	6
					5	Int.	▲	MWS0660LB	57.2	2.252	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7.0	.276	6
					8	Int.	▲	MWS0660X8DB	78.2	3.079	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7.0	.276	6
					10	Int.	★	MWS0660X10DB	92.2	3.630	95.2	3.748	148.2	5.835	147	5.787	1.2	.047	7.0	.276	7
					15	Int.	●	MWS0660X15DB	127.2	5.008	130.2	5.126	183.2	7.213	182	7.165	1.2	.047	7.0	.276	7
					20	Int.	★	MWS0660X20DB	162.2	6.386	165.2	6.504	218.2	8.591	217	8.543	1.2	.047	7.0	.276	7
					25	Int.	★	MWS0660X25DB	197.2	7.764	200.2	7.882	253.2	9.969	252	9.921	1.2	.047	7.0	.276	7
					30	Int.	★	MWS0660X30DB	232.2	9.142	235.2	9.260	288.2	11.346	287	11.299	1.2	.047	7.0	.276	7
6.700	.2638			M8x1.25	2	Ext.	▲	MWE0670SA	32.2	1.268	32.2	1.268	71.2	2.803	70	2.756	1.2	.047	6.7	.264	1
					3	Ext.	▲	MWE0670MA	44.2	1.740	44.2	1.740	84.2	3.315	83	3.268	1.2	.047	6.7	.264	1
					3	Int.	▲	MWS0670MB	36.2	1.425	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7.0	.276	6
					5	Int.	▲	MWS0670LB	57.2	2.252	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7.0	.276	6
					8	Int.	▲	MWS0670X8DB	78.2	3.079	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7.0	.276	6
					10	Int.	★	MWS0670X10DB	92.2	3.630	95.2	3.748	148.2	5.835	147	5.787	1.2	.047	7.0	.276	7
					15	Int.	●	MWS0670X15DB	127.2	5.008	130.2	5.126	183.2	7.213	182	7.165	1.2	.047	7.0	.276	7
					20	Int.	★	MWS0670X20DB	162.2	6.386	165.2	6.504	218.2	8.591	217	8.543	1.2	.047	7.0	.276	7
					25	Int.	★	MWS0670X25DB	197.2	7.764	200.2	7.882	253.2	9.969	252	9.921	1.2	.047	7.0	.276	7
					30	Int.	★	MWS0670X30DB	232.2	9.142	235.2	9.260	288.2	11.346	287	11.299	1.2	.047	7.0	.276	7
6.746	.2656	17/64			5	Int.	▲	MWS02656LB	57.2	2.252	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	6.746	.266	6
					8	Int.	▲	MWS02656X8DB	78.2	3.079	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	6.746	.266	6
					15	Int.	●	MWS02656X15DB	127.2	5.008	130.2	5.126	183.2	7.213	182	7.165	1.2	.047	6.746	.266	7
					20	Int.	●	MWS02656X20DB	162.2	6.386	165.2	6.504	218.2	8.591	217	8.543	1.2	.047	6.746	.266	7
					25	Int.	●	MWS02656X25DB	197.2	7.764	200.2	7.882	253.2	9.969	252	9.921	1.2	.047	6.746	.266	7
					30	Int.	●	MWS02656X30DB	232.2	9.142	235.2	9.260	288.2	11.346	287	11.299	1.2	.047	6.746	.266	7

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
6.800	.2677				2	Ext.	▲	MWE0680SA	35.2	1.386	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	6.8	.268	1
					3	Ext.	▲	MWE0680MA	44.2	1.740	44.2	1.740	84.2	3.315	83	3.268	1.2	.047	6.8	.268	1
					3	Int.	▲	MWS0680MB	36.2	1.425	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7.0	.276	6
					5	Int.	▲	MWS0680LB	57.2	2.252	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7.0	.276	6
					8	Int.	▲	MWS0680X8DB	78.2	3.079	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7.0	.276	6
					10	Int.	★	MWS0680X10DB	92.2	3.630	95.2	3.748	148.2	5.835	147	5.787	1.2	.047	7.0	.276	7
					15	Int.	●	MWS0680X15DB	127.2	5.008	130.2	5.126	183.2	7.213	182	7.165	1.2	.047	7.0	.276	7
					20	Int.	●	MWS0680X20DB	162.2	6.386	165.2	6.504	218.2	8.591	217	8.543	1.2	.047	7.0	.276	7
					25	Int.	★	MWS0680X25DB	197.2	7.764	200.2	7.882	253.2	9.969	252	9.921	1.2	.047	7.0	.276	7
					30	Int.	★	MWS0680X30DB	232.2	9.142	235.2	9.260	288.2	11.346	287	11.299	1.2	.047	7.0	.276	7
6.900	.2717			5/16-24	2	Ext.	▲	MWE0690SA	35.3	1.390	35.3	1.390	75.3	2.965	74	2.913	1.3	.051	6.9	.272	1
					3	Ext.	▲	MWE0690MA	44.3	1.744	44.3	1.744	84.3	3.319	83	3.268	1.3	.051	6.9	.272	1
					3	Int.	▲	MWS0690MB	36.3	1.429	36.3	1.429	89.3	3.516	88	3.465	1.3	.051	7.0	.276	6
					5	Int.	▲	MWS0690LB	57.3	2.256	57.3	2.256	110.3	4.343	109	4.291	1.3	.051	7.0	.276	6
					8	Int.	▲	MWS0690X8DB	78.3	3.083	78.3	3.083	131.3	5.169	130	5.118	1.3	.051	7.0	.276	6
					10	Int.	★	MWS0690X10DB	92.3	3.634	95.3	3.752	148.3	5.839	147	5.787	1.3	.051	7.0	.276	7
					15	Int.	●	MWS0690X15DB	127.3	5.012	130.3	5.130	183.3	7.217	182	7.165	1.3	.051	7.0	.276	7
					20	Int.	★	MWS0690X20DB	162.3	6.390	165.3	6.508	218.3	8.594	217	8.543	1.3	.051	7.0	.276	7
					25	Int.	★	MWS0690X25DB	197.3	7.768	200.3	7.886	253.3	9.972	252	9.921	1.3	.051	7.0	.276	7
					30	Int.	★	MWS0690X30DB	232.3	9.146	235.3	9.264	288.3	11.350	287	11.299	1.3	.051	7.0	.276	7
6.909	.2720		I	5/16-24	5	Int.	▲	MWS02720LB	57.3	2.256	57.3	2.256	110.3	4.343	109	4.291	1.3	.051	6.909	.272	6
					8	Int.	▲	MWS02720X8DB	78.3	3.083	78.3	3.083	131.3	5.169	130	5.118	1.3	.051	6.909	.272	6
					15	Int.	●	MWS02720X15DB	127.3	5.012	130.3	5.130	183.3	7.217	182	7.165	1.3	.051	6.909	.272	7
					20	Int.	●	MWS02720X20DB	162.3	6.390	165.3	6.508	218.3	8.594	217	8.543	1.3	.051	6.909	.272	7
					25	Int.	●	MWS02720X25DB	197.3	7.768	200.3	7.886	253.3	9.972	252	9.921	1.3	.051	6.909	.272	7
					30	Int.	●	MWS02720X30DB	232.3	9.146	235.3	9.264	288.3	11.350	287	11.299	1.3	.051	6.909	.272	7
7.000	.2756			M8x1.0	2	Ext.	▲	MWE0700SA	35.3	1.390	35.3	1.390	75.3	2.965	74	2.913	1.3	.051	7.0	.276	1
					3	Ext.	▲	MWE0700MA	44.3	1.744	44.3	1.744	84.3	3.319	83	3.268	1.3	.051	7.0	.276	1
					3	Int.	▲	MWS0700MB	36.3	1.429	36.3	1.429	89.3	3.516	88	3.465	1.3	.051	7.0	.276	6
					5	Int.	▲	MWS0700LB	57.3	2.256	57.3	2.256	110.3	4.343	109	4.291	1.3	.051	7.0	.276	6
					8	Int.	▲	MWS0700X8DB	78.3	3.083	78.3	3.083	131.3	5.169	130	5.118	1.3	.051	7.0	.276	6
					10	Int.	●	MWS0700X10DB	92.3	3.634	95.3	3.752	148.3	5.839	147	5.787	1.3	.051	7.0	.276	7
					15	Int.	●	MWS0700X15DB	127.3	5.012	130.3	5.130	183.3	7.217	182	7.165	1.3	.051	7.0	.276	7
					20	Int.	●	MWS0700X20DB	162.3	6.390	165.3	6.508	218.3	8.594	217	8.543	1.3	.051	7.0	.276	7
					25	Int.	●	MWS0700X25DB	197.3	7.768	200.3	7.886	253.3	9.972	252	9.921	1.3	.051	7.0	.276	7
					30	Int.	●	MWS0700X30DB	232.3	9.146	235.3	9.264	288.3	11.350	287	11.299	1.3	.051	7.0	.276	7
7.100	.2795				2	Ext.	▲	MWE0710SA	35.3	1.390	35.3	1.390	75.3	2.965	74	2.913	1.3	.051	7.1	.280	1
					3	Ext.	▲	MWE0710MA	46.3	1.823	46.3	1.823	88.3	3.476	87	3.425	1.3	.051	7.1	.280	1
					3	Int.	▲	MWS0710MB	38.8	1.528	41.3	1.626	95.3	3.752	94	3.701	1.3	.051	8.0	.315	6
					5	Int.	▲	MWS0710LB	61.3	2.413	65.3	2.571	119.3	4.697	118	4.646	1.3	.051	8.0	.315	6
					8	Int.	▲	MWS0710X8DB	84.3	3.319	89.3	3.516	143.3	5.642	142	5.591	1.3	.051	8.0	.315	6
					10	Int.	★	MWS0710X10DB	99.3	3.909	102.3	4.028	156.3	6.154	155	6.102	1.3	.051	8.0	.315	7
					15	Int.	●	MWS0710X15DB	136.3	5.366	139.3	5.484	193.3	7.610	192	7.559	1.3	.051	8.0	.315	7
					20	Int.	★	MWS0710X20DB	174.3	6.862	177.3	6.980	231.3	9.106	230	9.055	1.3	.051	8.0	.315	7
					25	Int.	★	MWS0710X25DB	211.3	8.319	214.3	8.437	268.3	10.563	267	10.512	1.3	.051	8.0	.315	7
					30	Int.	★	MWS0710X30DB	249.3	9.815	252.3	9.933	306.3	12.059	305	12.008	1.3	.051	8.0	.315	7

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

▲ : This item to be discontinued within two years.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
7.142	.2812	9/32	K		5	Int.	▲	MWS02812LB	61.3	2.413	65.3	2.571	119.3	4.697	118	4.646	1.3	.051	7.938	.313	6
					8	Int.	▲	MWS02812X8DB	84.3	3.319	89.3	3.516	143.3	5.642	142	5.591	1.3	.051	7.938	.313	6
					15	Int.	●	MWS02812X15DB	136.3	5.366	139.3	5.484	193.3	7.610	192	7.559	1.3	.051	7.938	.313	7
					20	Int.	●	MWS02812X20DB	174.3	6.862	177.3	6.980	231.3	9.106	230	9.055	1.3	.051	7.938	.313	7
					25	Int.	●	MWS02812X25DB	211.3	8.319	214.3	8.437	268.3	10.563	267	10.512	1.3	.051	7.938	.313	7
					30	Int.	●	MWS02812X30DB	249.3	9.815	252.3	9.933	306.3	12.059	305	12.008	1.3	.051	7.938	.313	7
7.200	.2835				2	Ext.	▲	MWE0720SA	35.3	1.390	35.3	1.390	75.3	2.965	74	2.913	1.3	.051	7.2	.283	1
					3	Ext.	▲	MWE0720MA	46.3	1.823	46.3	1.823	88.3	3.476	87	3.425	1.3	.051	7.2	.283	1
					3	Int.	▲	MWS0720MB	38.8	1.528	41.3	1.626	95.3	3.752	94	3.701	1.3	.051	8.0	.315	6
					5	Int.	▲	MWS0720LB	61.3	2.413	65.3	2.571	119.3	4.697	118	4.646	1.3	.051	8.0	.315	6
					8	Int.	▲	MWS0720X8DB	84.3	3.319	89.3	3.516	143.3	5.642	142	5.591	1.3	.051	8.0	.315	6
					10	Int.	★	MWS0720X10DB	99.3	3.909	102.3	4.028	156.3	6.154	155	6.102	1.3	.051	8.0	.315	7
					15	Int.	★	MWS0720X15DB	136.3	5.366	139.3	5.484	193.3	7.610	192	7.559	1.3	.051	8.0	.315	7
					20	Int.	●	MWS0720X20DB	174.3	6.862	177.3	6.980	231.3	9.106	230	9.055	1.3	.051	8.0	.315	7
					25	Int.	★	MWS0720X25DB	211.3	8.319	214.3	8.437	268.3	10.563	267	10.512	1.3	.051	8.0	.315	7
					30	Int.	★	MWS0720X30DB	249.3	9.815	252.3	9.933	306.3	12.059	305	12.008	1.3	.051	8.0	.315	7
7.300	.2874				2	Ext.	▲	MWE0730SA	35.3	1.390	35.3	1.390	75.3	2.965	74	2.913	1.3	.051	7.3	.287	1
					3	Ext.	▲	MWE0730MA	46.3	1.823	46.3	1.823	88.3	3.476	87	3.425	1.3	.051	7.3	.287	1
					3	Int.	▲	MWS0730MB	38.8	1.528	41.3	1.626	95.3	3.752	94	3.701	1.3	.051	8.0	.315	6
					5	Int.	▲	MWS0730LB	61.3	2.413	65.3	2.571	119.3	4.697	118	4.646	1.3	.051	8.0	.315	6
					8	Int.	▲	MWS0730X8DB	84.3	3.319	89.3	3.516	143.3	5.642	142	5.591	1.3	.051	8.0	.315	6
					10	Int.	★	MWS0730X10DB	99.3	3.909	102.3	4.028	156.3	6.154	155	6.102	1.3	.051	8.0	.315	7
					15	Int.	●	MWS0730X15DB	136.3	5.366	139.3	5.484	193.3	7.610	192	7.559	1.3	.051	8.0	.315	7
					20	Int.	★	MWS0730X20DB	174.3	6.862	177.3	6.980	231.3	9.106	230	9.055	1.3	.051	8.0	.315	7
					25	Int.	★	MWS0730X25DB	211.3	8.319	214.3	8.437	268.3	10.563	267	10.512	1.3	.051	8.0	.315	7
					30	Int.	★	MWS0730X30DB	249.3	9.815	252.3	9.933	306.3	12.059	305	12.008	1.3	.051	8.0	.315	7
7.400	.2913				2	Ext.	▲	MWE0740SA	35.4	1.394	35.4	1.394	75.4	2.969	74	2.913	1.4	.055	7.4	.291	1
					3	Ext.	▲	MWE0740MA	46.4	1.827	46.4	1.827	88.4	3.480	87	3.425	1.4	.055	7.4	.291	1
					3	Int.	▲	MWS0740MB	38.9	1.531	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8.0	.315	6
					5	Int.	▲	MWS0740LB	61.4	2.417	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8.0	.315	6
					8	Int.	▲	MWS0740X8DB	84.4	3.323	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8.0	.315	6
					10	Int.	★	MWS0740X10DB	99.4	3.913	102.4	4.031	156.4	6.157	155	6.102	1.4	.055	8.0	.315	7
					15	Int.	●	MWS0740X15DB	136.4	5.370	139.4	5.488	193.4	7.614	192	7.559	1.4	.055	8.0	.315	7
					20	Int.	★	MWS0740X20DB	174.4	6.866	177.4	6.984	231.4	9.110	230	9.055	1.4	.055	8.0	.315	7
					25	Int.	★	MWS0740X25DB	211.4	8.323	214.4	8.441	268.4	10.567	267	10.512	1.4	.055	8.0	.315	7
					30	Int.	★	MWS0740X30DB	249.4	9.819	252.4	9.937	306.4	12.063	305	12.008	1.4	.055	8.0	.315	7
7.500	.2953		M		2	Ext.	▲	MWE0750SA	35.4	1.394	35.4	1.394	75.4	2.969	74	2.913	1.4	.055	7.5	.295	1
					3	Ext.	▲	MWE0750MA	46.4	1.827	46.4	1.827	88.4	3.480	87	3.425	1.4	.055	7.5	.295	1
					3	Int.	▲	MWS0750MB	38.9	1.531	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8.0	.315	6
					5	Int.	▲	MWS0750LB	61.4	2.417	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8.0	.315	6
					8	Int.	▲	MWS0750X8DB	84.4	3.323	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8.0	.315	6
					10	Int.	●	MWS0750X10DB	99.4	3.913	102.4	4.031	156.4	6.157	155	6.102	1.4	.055	8.0	.315	7
					15	Int.	●	MWS0750X15DB	136.4	5.370	139.4	5.488	193.4	7.614	192	7.559	1.4	.055	8.0	.315	7
					20	Int.	★	MWS0750X20DB	174.4	6.866	177.4	6.984	231.4	9.110	230	9.055	1.4	.055	8.0	.315	7
					25	Int.	★	MWS0750X25DB	211.4	8.323	214.4	8.441	268.4	10.567	267	10.512	1.4	.055	8.0	.315	7
					30	Int.	★	MWS0750X30DB	249.4	9.819	252.4	9.937	306.4	12.063	305	12.008	1.4	.055	8.0	.315	7

CUTTING CONDITIONS ➤ L088
HOW TO USE ➤ L094
TECHNICAL DATA ➤ N001

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
7.541	.2969	19/64			5	Int.	▲	MWS02969LB	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	7.938	.313	6
					8	Int.	▲	MWS02969X8DB	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	7.938	.313	6
					15	Int.	●	MWS02969X15DB	145.4	5.724	148.4	5.843	202.4	7.969	201	7.913	1.4	.055	7.938	.313	7
					20	Int.	●	MWS02969X20DB	185.4	7.299	188.4	7.417	242.4	9.543	241	9.488	1.4	.055	7.938	.313	7
					25	Int.	●	MWS02969X25DB	225.4	8.874	228.4	8.992	282.4	11.118	281	11.063	1.4	.055	7.938	.313	7
					30	Int.	●	MWS02969X30DB	265.4	10.449	268.4	10.567	322.4	12.693	321	12.638	1.4	.055	7.938	.313	7
7.600	.2992				2	Ext.	▲	MWE0760SA	38.4	1.512	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	7.6	.299	1
					3	Ext.	▲	MWE0760MA	49.4	1.945	49.4	1.945	91.4	3.598	90	3.543	1.4	.055	7.6	.299	1
					3	Int.	▲	MWS0760MB	41.4	1.630	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8.0	.315	6
					5	Int.	▲	MWS0760LB	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8.0	.315	6
					8	Int.	▲	MWS0760X8DB	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8.0	.315	6
					10	Int.	★	MWS0760X10DB	105.4	4.150	108.4	4.268	162.4	6.394	161	6.339	1.4	.055	8.0	.315	7
					15	Int.	★	MWS0760X15DB	145.4	5.724	148.4	5.843	202.4	7.969	201	7.913	1.4	.055	8.0	.315	7
					20	Int.	★	MWS0760X20DB	185.4	7.299	188.4	7.417	242.4	9.543	241	9.488	1.4	.055	8.0	.315	7
					25	Int.	★	MWS0760X25DB	225.4	8.874	228.4	8.992	282.4	11.118	281	11.063	1.4	.055	8.0	.315	7
					30	Int.	★	MWS0760X30DB	265.4	10.449	268.4	10.567	322.4	12.693	321	12.638	1.4	.055	8.0	.315	7
7.700	.3031				2	Ext.	▲	MWE0770SA	38.4	1.512	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	7.7	.303	1
					3	Ext.	▲	MWE0770MA	49.4	1.945	49.4	1.945	91.4	3.598	90	3.543	1.4	.055	7.7	.303	1
					3	Int.	▲	MWS0770MB	41.4	1.630	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8.0	.315	6
					5	Int.	▲	MWS0770LB	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8.0	.315	6
					8	Int.	▲	MWS0770X8DB	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8.0	.315	6
					10	Int.	●	MWS0770X10DB	105.4	4.150	108.4	4.268	162.4	6.394	161	6.339	1.4	.055	8.0	.315	7
					15	Int.	●	MWS0770X15DB	145.4	5.724	148.4	5.843	202.4	7.969	201	7.913	1.4	.055	8.0	.315	7
					20	Int.	★	MWS0770X20DB	185.4	7.299	188.4	7.417	242.4	9.543	241	9.488	1.4	.055	8.0	.315	7
					25	Int.	★	MWS0770X25DB	225.4	8.874	228.4	8.992	282.4	11.118	281	11.063	1.4	.055	8.0	.315	7
					30	Int.	★	MWS0770X30DB	265.4	10.449	268.4	10.567	322.4	12.693	321	12.638	1.4	.055	8.0	.315	7
7.800	.3071				2	Ext.	▲	MWE0780SA	38.4	1.512	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	7.8	.307	1
					3	Ext.	▲	MWE0780MA	49.4	1.945	49.4	1.945	91.4	3.598	90	3.543	1.4	.055	7.8	.307	1
					3	Int.	▲	MWS0780MB	41.4	1.630	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8.0	.315	6
					5	Int.	▲	MWS0780LB	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8.0	.315	6
					8	Int.	▲	MWS0780X8DB	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8.0	.315	6
					10	Int.	★	MWS0780X10DB	105.4	4.150	108.4	4.268	162.4	6.394	161	6.339	1.4	.055	8.0	.315	7
					15	Int.	●	MWS0780X15DB	145.4	5.724	148.4	5.843	202.4	7.969	201	7.913	1.4	.055	8.0	.315	7
					20	Int.	●	MWS0780X20DB	185.4	7.299	188.4	7.417	242.4	9.543	241	9.488	1.4	.055	8.0	.315	7
					25	Int.	●	MWS0780X25DB	225.4	8.874	228.4	8.992	282.4	11.118	281	11.063	1.4	.055	8.0	.315	7
					30	Int.	★	MWS0780X30DB	265.4	10.449	268.4	10.567	322.4	12.693	321	12.638	1.4	.055	8.0	.315	7
7.900	.3110				2	Ext.	▲	MWE0790SA	38.4	1.512	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	7.9	.311	1
					3	Ext.	▲	MWE0790MA	49.4	1.945	49.4	1.945	91.4	3.598	90	3.543	1.4	.055	7.9	.311	1
					3	Int.	▲	MWS0790MB	41.4	1.630	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8.0	.315	6
					5	Int.	▲	MWS0790LB	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8.0	.315	6
					8	Int.	▲	MWS0790X8DB	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8.0	.315	6
					10	Int.	●	MWS0790X10DB	105.4	4.150	108.4	4.268	162.4	6.394	161	6.339	1.4	.055	8.0	.315	7
					15	Int.	★	MWS0790X15DB	145.4	5.724	148.4	5.843	202.4	7.969	201	7.913	1.4	.055	8.0	.315	7
					20	Int.	★	MWS0790X20DB	185.4	7.299	188.4	7.417	242.4	9.543	241	9.488	1.4	.055	8.0	.315	7
					25	Int.	★	MWS0790X25DB	225.4	8.874	228.4	8.992	282.4	11.118	281	11.063	1.4	.055	8.0	.315	7
					30	Int.	★	MWS0790X30DB	265.4	10.449	268.4	10.567	322.4	12.693	321	12.638	1.4	.055	8.0	.315	7

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

▲ : This item to be discontinued within two years.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
7.938	.3125	5/16		3/8-16	5	Int.	▲	MWS03125LB	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	7.938	.313	6
					8	Int.	▲	MWS03125X8DB	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	7.938	.313	6
					15	Int.	●	MWS03125X15DB	145.4	5.724	148.4	5.843	202.4	7.969	201	7.913	1.4	.055	7.938	.313	7
					20	Int.	●	MWS03125X20DB	185.4	7.299	188.4	7.417	242.4	9.543	241	9.488	1.4	.055	7.938	.313	7
					25	Int.	●	MWS03125X25DB	225.4	8.874	228.4	8.992	282.4	11.118	281	11.063	1.4	.055	7.938	.313	7
					30	Int.	●	MWS03125X30DB	265.4	10.449	268.4	10.567	322.4	12.693	321	12.638	1.4	.055	7.938	.313	7
8.000	.3150				2	Ext.	▲	MWE0800SA	38.5	1.516	38.5	1.516	80.5	3.169	79	3.110	1.5	.059	8.0	.315	1
					3	Ext.	▲	MWE0800MA	49.5	1.949	49.5	1.949	91.5	3.602	90	3.543	1.5	.059	8.0	.315	1
					3	Int.	▲	MWS0800MB	41.5	1.634	41.5	1.634	95.5	3.760	94	3.701	1.5	.059	8.0	.315	6
					5	Int.	▲	MWS0800LB	65.5	2.579	65.5	2.579	119.5	4.705	118	4.646	1.5	.059	8.0	.315	6
					8	Int.	▲	MWS0800X8DB	89.5	3.524	89.5	3.524	143.5	5.650	142	5.591	1.5	.059	8.0	.315	6
					10	Int.	●	MWS0800X10DB	105.5	4.154	108.5	4.272	162.5	6.398	161	6.339	1.5	.059	8.0	.315	7
					15	Int.	●	MWS0800X15DB	145.5	5.728	148.5	5.846	202.5	7.972	201	7.913	1.5	.059	8.0	.315	7
					20	Int.	●	MWS0800X20DB	185.5	7.303	188.5	7.421	242.5	9.547	241	9.488	1.5	.059	8.0	.315	7
					25	Int.	★	MWS0800X25DB	225.5	8.878	228.5	8.996	282.5	11.122	281	11.063	1.5	.059	8.0	.315	7
					30	Int.	●	MWS0800X30DB	265.5	10.453	268.5	10.571	322.5	12.697	321	12.638	1.5	.059	8.0	.315	7
8.100	.3189				2	Ext.	▲	MWE0810SA	38.5	1.516	38.5	1.516	80.5	3.169	79	3.110	1.5	.059	8.1	.319	1
					3	Ext.	▲	MWE0810MA	54.5	2.146	54.5	2.146	97.5	3.839	96	3.780	1.5	.059	8.1	.319	1
					3	Int.	▲	MWS0810MB	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	9.0	.354	6
					5	Int.	▲	MWS0810LB	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	9.0	.354	6
					8	Int.	▲	MWS0810X8DB	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	9.0	.354	6
					10	Int.	●	MWS0810X10DB	112.5	4.429	115.5	4.547	170.5	6.713	169	6.654	1.5	.059	9.0	.354	7
					15	Int.	★	MWS0810X15DB	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	9.0	.354	7
					20	Int.	★	MWS0810X20DB	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	9.0	.354	7
					25	Int.	★	MWS0810X25DB	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	9.0	.354	7
					30	Int.	★	MWS0810X30DB	282.5	11.122	285.5	11.240	340.5	13.406	339	13.346	1.5	.059	9.0	.354	7
8.200	.3228		P		2	Ext.	▲	MWE0820SA	38.5	1.516	38.5	1.516	80.5	3.169	79	3.110	1.5	.059	8.2	.323	1
					3	Ext.	▲	MWE0820MA	54.5	2.146	54.5	2.146	97.5	3.839	96	3.780	1.5	.059	8.2	.323	1
					3	Int.	▲	MWS0820MB	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	9.0	.354	6
					5	Int.	▲	MWS0820LB	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	9.0	.354	6
					8	Int.	▲	MWS0820X8DB	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	9.0	.354	6
					10	Int.	★	MWS0820X10DB	112.5	4.429	115.5	4.547	170.5	6.713	169	6.654	1.5	.059	9.0	.354	7
					15	Int.	★	MWS0820X15DB	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	9.0	.354	7
					20	Int.	★	MWS0820X20DB	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	9.0	.354	7
					25	Int.	★	MWS0820X25DB	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	9.0	.354	7
					30	Int.	●	MWS0820X30DB	282.5	11.122	285.5	11.240	340.5	13.406	339	13.346	1.5	.059	9.0	.354	7
8.300	.3268				2	Ext.	▲	MWE0830SA	38.5	1.516	38.5	1.516	80.5	3.169	79	3.110	1.5	.059	8.3	.327	1
					3	Ext.	▲	MWE0830MA	54.5	2.146	54.5	2.146	97.5	3.839	96	3.780	1.5	.059	8.3	.327	1
					3	Int.	▲	MWS0830MB	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	9.0	.354	6
					5	Int.	▲	MWS0830LB	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	9.0	.354	6
					8	Int.	▲	MWS0830X8DB	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	9.0	.354	6
					10	Int.	★	MWS0830X10DB	112.5	4.429	115.5	4.547	170.5	6.713	169	6.654	1.5	.059	9.0	.354	7
					15	Int.	★	MWS0830X15DB	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	9.0	.354	7
					20	Int.	★	MWS0830X20DB	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	9.0	.354	7
					25	Int.	★	MWS0830X25DB	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	9.0	.354	7
					30	Int.	★	MWS0830X30DB	282.5	11.122	285.5	11.240	340.5	13.406	339	13.346	1.5	.059	9.0	.354	7

CUTTING CONDITIONS ➤ L088
HOW TO USE ➤ L094
TECHNICAL DATA ➤ N001

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
8.334	.3281	21/64			5	Int.	▲	MWS03281LB	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	8.733	.344	6
					8	Int.	▲	MWS03281X8DB	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	8.733	.344	6
					15	Int.	●	MWS03281X15DB	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	8.733	.344	7
					20	Int.	●	MWS03281X20DB	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	8.733	.344	7
					25	Int.	●	MWS03281X25DB	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	8.733	.344	7
8.400	.3307				2	Ext.	▲	MWE0840SA	38.5	1.516	38.5	1.516	80.5	3.169	79	3.110	1.5	.059	8.4	.331	1
					3	Ext.	▲	MWE0840MA	54.5	2.146	54.5	2.146	97.5	3.839	96	3.780	1.5	.059	8.4	.331	1
					3	Int.	▲	MWS0840MB	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	9.0	.354	6
					5	Int.	▲	MWS0840LB	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	9.0	.354	6
					8	Int.	▲	MWS0840X8DB	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	9.0	.354	6
					10	Int.	★	MWS0840X10DB	112.5	4.429	115.5	4.547	170.5	6.713	169	6.654	1.5	.059	9.0	.354	7
					15	Int.	★	MWS0840X15DB	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	9.0	.354	7
					20	Int.	★	MWS0840X20DB	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	9.0	.354	7
					25	Int.	★	MWS0840X25DB	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	9.0	.354	7
					30	Int.	★	MWS0840X30DB	282.5	11.122	285.5	11.240	340.5	13.406	339	13.346	1.5	.059	9.0	.354	7
8.433	.3320		Q	3/8-24	5	Int.	▲	MWS03320LB	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	8.733	.344	6
					8	Int.	▲	MWS03320X8DB	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	8.733	.344	6
					15	Int.	●	MWS03320X15DB	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	8.733	.344	7
					20	Int.	●	MWS03320X20DB	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	8.733	.344	7
					25	Int.	●	MWS03320X25DB	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	8.733	.344	7
8.500	.3346			M10x1.5	2	Ext.	▲	MWE0850SA	38.6	1.520	38.6	1.520	80.6	3.173	79	3.110	1.6	.063	8.5	.335	1
					3	Ext.	▲	MWE0850MA	54.6	2.150	54.6	2.150	97.6	3.843	96	3.780	1.6	.063	8.5	.335	1
					3	Int.	▲	MWS0850MB	44.1	1.736	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9.0	.354	6
					5	Int.	▲	MWS0850LB	69.6	2.740	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9.0	.354	6
					8	Int.	▲	MWS0850X8DB	95.6	3.764	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9.0	.354	6
					10	Int.	●	MWS0850X10DB	112.6	4.433	115.6	4.551	170.6	6.717	169	6.654	1.6	.063	9.0	.354	7
					15	Int.	●	MWS0850X15DB	154.6	6.087	157.6	6.205	212.6	8.370	211	8.307	1.6	.063	9.0	.354	7
					20	Int.	●	MWS0850X20DB	197.6	7.780	200.6	7.898	255.6	10.063	254	10.000	1.6	.063	9.0	.354	7
					25	Int.	★	MWS0850X25DB	239.6	9.433	242.6	9.551	297.6	11.717	296	11.654	1.6	.063	9.0	.354	7
					30	Int.	●	MWS0850X30DB	282.6	11.126	285.6	11.244	340.6	13.409	339	13.346	1.6	.063	9.0	.354	7
8.600	.3386		R		2	Ext.	▲	MWE0860SA	41.6	1.638	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	8.6	.339	1
					3	Ext.	▲	MWE0860MA	56.6	2.228	56.6	2.228	99.6	3.921	98	3.858	1.6	.063	8.6	.339	1
					3	Int.	▲	MWS0860MB	46.6	1.835	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9.0	.354	6
					5	Int.	▲	MWS0860LB	73.6	2.898	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9.0	.354	6
					8	Int.	▲	MWS0860X8DB	100.6	3.961	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9.0	.354	6
					10	Int.	★	MWS0860X10DB	118.6	4.669	121.6	4.787	176.6	6.953	175	6.890	1.6	.063	9.0	.354	7
					15	Int.	★	MWS0860X15DB	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	9.0	.354	7
					20	Int.	★	MWS0860X20DB	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	9.0	.354	7
					25	Int.	★	MWS0860X25DB	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	9.0	.354	7
					30	Int.	★	MWS0860X30DB	298.6	11.756	301.6	11.874	356.6	14.039	355	13.976	1.6	.063	9.0	.354	7

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▲ : This item to be discontinued within two years.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
8.700	.3425			M10x1.25	2	Ext.	▲	MWE0870SA	41.6	1.638	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	8.7	.343	1
					3	Ext.	▲	MWE0870MA	56.6	2.228	56.6	2.228	99.6	3.921	98	3.858	1.6	.063	8.7	.343	1
					3	Int.	▲	MWS0870MB	46.6	1.835	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9.0	.354	6
					5	Int.	▲	MWS0870LB	73.6	2.898	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9.0	.354	6
					8	Int.	▲	MWS0870X8DB	100.6	3.961	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9.0	.354	6
					10	Int.	●	MWS0870X10DB	118.6	4.669	121.6	4.787	176.6	6.953	175	6.890	1.6	.063	9.0	.354	7
					15	Int.	★	MWS0870X15DB	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	9.0	.354	7
					20	Int.	★	MWS0870X20DB	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	9.0	.354	7
					25	Int.	★	MWS0870X25DB	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	9.0	.354	7
					30	Int.	★	MWS0870X30DB	298.6	11.756	301.6	11.874	356.6	14.039	355	13.976	1.6	.063	9.0	.354	7
8.733	.3438	11/32			5	Int.	▲	MWS03438LB	73.6	2.898	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	8.733	.344	6
					8	Int.	▲	MWS03438X8DB	100.6	3.961	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	8.733	.344	6
					15	Int.	●	MWS03438X15DB	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	8.733	.344	7
					20	Int.	●	MWS03438X20DB	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	8.733	.344	7
					25	Int.	●	MWS03438X25DB	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	8.733	.344	7
8.800	.3465				2	Ext.	▲	MWE0880SA	41.6	1.638	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	8.8	.346	1
					3	Ext.	▲	MWE0880MA	56.6	2.228	56.6	2.228	99.6	3.921	98	3.858	1.6	.063	8.8	.346	1
					3	Int.	▲	MWS0880MB	46.6	1.835	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9.0	.354	6
					5	Int.	▲	MWS0880LB	73.6	2.898	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9.0	.354	6
					8	Int.	▲	MWS0880X8DB	100.6	3.961	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9.0	.354	6
					10	Int.	★	MWS0880X10DB	118.6	4.669	121.6	4.787	176.6	6.953	175	6.890	1.6	.063	9.0	.354	7
					15	Int.	★	MWS0880X15DB	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	9.0	.354	7
					20	Int.	★	MWS0880X20DB	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	9.0	.354	7
					25	Int.	★	MWS0880X25DB	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	9.0	.354	7
					30	Int.	★	MWS0880X30DB	298.6	11.756	301.6	11.874	356.6	14.039	355	13.976	1.6	.063	9.0	.354	7
8.900	.3504				2	Ext.	▲	MWE0890SA	41.6	1.638	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	8.9	.350	1
					3	Ext.	▲	MWE0890MA	56.6	2.228	56.6	2.228	99.6	3.921	98	3.858	1.6	.063	8.9	.350	1
					3	Int.	▲	MWS0890MB	46.6	1.835	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9.0	.354	6
					5	Int.	▲	MWS0890LB	73.6	2.898	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9.0	.354	6
					8	Int.	▲	MWS0890X8DB	100.6	3.961	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9.0	.354	6
					10	Int.	★	MWS0890X10DB	118.6	4.669	121.6	4.787	176.6	6.953	175	6.890	1.6	.063	9.0	.354	7
					15	Int.	★	MWS0890X15DB	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	9.0	.354	7
					20	Int.	★	MWS0890X20DB	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	9.0	.354	7
					25	Int.	★	MWS0890X25DB	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	9.0	.354	7
					30	Int.	★	MWS0890X30DB	298.6	11.756	301.6	11.874	356.6	14.039	355	13.976	1.6	.063	9.0	.354	7
9.000	.3543				2	Ext.	▲	MWE0900SA	41.6	1.638	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	9.0	.354	1
					3	Ext.	▲	MWE0900MA	56.6	2.228	56.6	2.228	99.6	3.921	98	3.858	1.6	.063	9.0	.354	1
					3	Int.	▲	MWS0900MB	46.6	1.835	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9.0	.354	6
					5	Int.	▲	MWS0900LB	73.6	2.898	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9.0	.354	6
					8	Int.	▲	MWS0900X8DB	100.6	3.961	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9.0	.354	6
					10	Int.	●	MWS0900X10DB	118.6	4.669	121.6	4.787	176.6	6.953	175	6.890	1.6	.063	9.0	.354	7
					15	Int.	●	MWS0900X15DB	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	9.0	.354	7
					20	Int.	●	MWS0900X20DB	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	9.0	.354	7
					25	Int.	★	MWS0900X25DB	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	9.0	.354	7
					30	Int.	★	MWS0900X30DB	298.6	11.756	301.6	11.874	356.6	14.039	355	13.976	1.6	.063	9.0	.354	7

CUTTING CONDITIONS ➤ L088
HOW TO USE ➤ L094
TECHNICAL DATA ➤ N001

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
9.100	.3583		T		2	Ext.	▲	MWE0910SA	41.7	1.642	41.7	1.642	85.7	3.374	84	3.307	1.7	.067	9.1	.358	1
					3	Ext.	▲	MWE0910MA	59.7	2.350	59.7	2.350	103.7	4.083	102	4.016	1.7	.067	9.1	.358	1
					3	Int.	▲	MWS0910MB	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10.0	.394	6
					5	Int.	▲	MWS0910LB	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10.0	.394	6
					8	Int.	▲	MWS0910X8DB	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10.0	.394	6
					10	Int.	★	MWS0910X10DB	125.7	4.949	128.7	5.067	183.7	7.232	182	7.165	1.7	.067	10.0	.394	7
					15	Int.	★	MWS0910X15DB	172.7	6.799	175.7	6.917	230.7	9.083	229	9.016	1.7	.067	10.0	.394	7
					20	Int.	★	MWS0910X20DB	220.7	8.689	223.7	8.807	278.7	10.972	277	10.906	1.7	.067	10.0	.394	7
					25	Int.	★	MWS0910X25DB	267.7	10.539	270.7	10.657	325.7	12.823	324	12.756	1.7	.067	10.0	.394	7
					30	Int.	★	MWS0910X30DB	315.7	12.429	318.7	12.547	373.7	14.713	372	14.646	1.7	.067	10.0	.394	7
9.129	.3594	23/64			5	Int.	▲	MWS03594LB	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	9.921	.391	6
					8	Int.	▲	MWS03594X8DB	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	9.921	.391	6
					15	Int.	●	MWS03594X15DB	172.7	6.799	175.7	6.917	230.7	9.083	229	9.016	1.7	.067	9.921	.391	7
					20	Int.	●	MWS03594X20DB	220.7	8.689	223.7	8.807	278.7	10.972	277	10.906	1.7	.067	9.921	.391	7
					25	Int.	●	MWS03594X25DB	267.7	10.539	270.7	10.657	325.7	12.823	324	12.756	1.7	.067	9.921	.391	7
9.200	.3622				2	Ext.	▲	MWE0920SA	41.7	1.642	41.7	1.642	85.7	3.374	84	3.307	1.7	.067	9.2	.362	1
					3	Ext.	▲	MWE0920MA	59.7	2.350	59.7	2.350	103.7	4.083	102	4.016	1.7	.067	9.2	.362	1
					3	Int.	▲	MWS0920MB	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10.0	.394	6
					5	Int.	▲	MWS0920LB	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10.0	.394	6
					8	Int.	▲	MWS0920X8DB	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10.0	.394	6
					10	Int.	★	MWS0920X10DB	125.7	4.949	128.7	5.067	183.7	7.232	182	7.165	1.7	.067	10.0	.394	7
					15	Int.	★	MWS0920X15DB	172.7	6.799	175.7	6.917	230.7	9.083	229	9.016	1.7	.067	10.0	.394	7
					20	Int.	★	MWS0920X20DB	220.7	8.689	223.7	8.807	278.7	10.972	277	10.906	1.7	.067	10.0	.394	7
					25	Int.	★	MWS0920X25DB	267.7	10.539	270.7	10.657	325.7	12.823	324	12.756	1.7	.067	10.0	.394	7
					30	Int.	★	MWS0920X30DB	315.7	12.429	318.7	12.547	373.7	14.713	372	14.646	1.7	.067	10.0	.394	7
9.300	.3661				2	Ext.	▲	MWE0930SA	41.7	1.642	41.7	1.642	85.7	3.374	84	3.307	1.7	.067	9.3	.366	1
					3	Ext.	▲	MWE0930MA	59.7	2.350	59.7	2.350	103.7	4.083	102	4.016	1.7	.067	9.3	.366	1
					3	Int.	▲	MWS0930MB	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10.0	.394	6
					5	Int.	▲	MWS0930LB	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10.0	.394	6
					8	Int.	▲	MWS0930X8DB	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10.0	.394	6
					10	Int.	●	MWS0930X10DB	125.7	4.949	128.7	5.067	183.7	7.232	182	7.165	1.7	.067	10.0	.394	7
					15	Int.	●	MWS0930X15DB	172.7	6.799	175.7	6.917	230.7	9.083	229	9.016	1.7	.067	10.0	.394	7
					20	Int.	★	MWS0930X20DB	220.7	8.689	223.7	8.807	278.7	10.972	277	10.906	1.7	.067	10.0	.394	7
					25	Int.	★	MWS0930X25DB	267.7	10.539	270.7	10.657	325.7	12.823	324	12.756	1.7	.067	10.0	.394	7
					30	Int.	★	MWS0930X30DB	315.7	12.429	318.7	12.547	373.7	14.713	372	14.646	1.7	.067	10.0	.394	7
9.347	.3680		U	7/16-14	5	Int.	▲	MWS03680LB	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	9.921	.391	6
					8	Int.	▲	MWS03680X8DB	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	9.921	.391	6
					15	Int.	●	MWS03680X15DB	172.7	6.799	175.7	6.917	230.7	9.083	229	9.016	1.7	.067	9.921	.391	7
					20	Int.	●	MWS03680X20DB	220.7	8.689	223.7	8.807	278.7	10.972	277	10.906	1.7	.067	9.921	.391	7
					25	Int.	●	MWS03680X25DB	267.7	10.539	270.7	10.657	325.7	12.823	324	12.756	1.7	.067	9.921	.391	7

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

▲ : This item to be discontinued within two years.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
9.400	.3701				2	Ext.	▲	MWE0940SA	41.7	1.642	41.7	1.642	85.7	3.374	84	3.307	1.7	.067	9.4	.370	1
					3	Ext.	▲	MWE0940MA	59.7	2.350	59.7	2.350	103.7	4.083	102	4.016	1.7	.067	9.4	.370	1
					3	Int.	▲	MWS0940MB	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10.0	.394	6
					5	Int.	▲	MWS0940LB	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10.0	.394	6
					8	Int.	▲	MWS0940X8DB	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10.0	.394	6
					10	Int.	★	MWS0940X10DB	125.7	4.949	128.7	5.067	183.7	7.232	182	7.165	1.7	.067	10.0	.394	7
					15	Int.	★	MWS0940X15DB	172.7	6.799	175.7	6.917	230.7	9.083	229	9.016	1.7	.067	10.0	.394	7
					20	Int.	★	MWS0940X20DB	220.7	8.689	223.7	8.807	278.7	10.972	277	10.906	1.7	.067	10.0	.394	7
					25	Int.	★	MWS0940X25DB	267.7	10.539	270.7	10.657	325.7	12.823	324	12.756	1.7	.067	10.0	.394	7
					30	Int.	★	MWS0940X30DB	315.7	12.429	318.7	12.547	373.7	14.713	372	14.646	1.7	.067	10.0	.394	7
9.500	.3740				2	Ext.	▲	MWE0950SA	41.7	1.642	41.7	1.642	85.7	3.374	84	3.307	1.7	.067	9.5	.374	1
					3	Ext.	▲	MWE0950MA	59.7	2.350	59.7	2.350	103.7	4.083	102	4.016	1.7	.067	9.5	.374	1
					3	Int.	▲	MWS0950MB	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10.0	.394	6
					5	Int.	▲	MWS0950LB	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10.0	.394	6
					8	Int.	▲	MWS0950X8DB	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10.0	.394	6
					10	Int.	●	MWS0950X10DB	125.7	4.949	128.7	5.067	183.7	7.232	182	7.165	1.7	.067	10.0	.394	7
					15	Int.	★	MWS0950X15DB	172.7	6.799	175.7	6.917	230.7	9.083	229	9.016	1.7	.067	10.0	.394	7
					20	Int.	●	MWS0950X20DB	220.7	8.689	223.7	8.807	278.7	10.972	277	10.906	1.7	.067	10.0	.394	7
					25	Int.	●	MWS0950X25DB	267.7	10.539	270.7	10.657	325.7	12.823	324	12.756	1.7	.067	10.0	.394	7
					30	Int.	●	MWS0950X30DB	315.7	12.429	318.7	12.547	373.7	14.713	372	14.646	1.7	.067	10.0	.394	7
9.525	.3750	3/8			5	Int.	▲	MWS03750LB	81.7	3.217	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	9.921	.391	6
					8	Int.	▲	MWS03750X8DB	111.7	4.398	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	9.921	.391	6
					15	Int.	●	MWS03750X15DB	181.7	7.154	184.7	7.272	239.7	9.437	238	9.370	1.7	.067	9.921	.391	7
					20	Int.	●	MWS03750X20DB	231.7	9.122	234.7	9.240	289.7	11.406	288	11.339	1.7	.067	9.921	.391	7
					25	Int.	●	MWS03750X25DB	281.7	11.091	284.7	11.209	339.7	13.374	338	13.307	1.7	.067	9.921	.391	7
9.600	.3780				2	Ext.	▲	MWE0960SA	44.8	1.764	44.8	1.764	90.8	3.575	89	3.504	1.8	.071	9.6	.378	1
					3	Ext.	▲	MWE0960MA	61.8	2.433	61.8	2.433	106.8	4.205	105	4.134	1.8	.071	9.6	.378	1
					3	Int.	▲	MWS0960MB	51.8	2.039	51.8	2.039	107.8	4.244	106	4.173	1.8	.071	10.0	.394	6
					5	Int.	▲	MWS0960LB	81.8	3.220	81.8	3.220	137.8	5.425	136	5.354	1.8	.071	10.0	.394	6
					8	Int.	▲	MWS0960X8DB	111.8	4.402	111.8	4.402	167.8	6.606	166	6.535	1.8	.071	10.0	.394	6
					10	Int.	●	MWS0960X10DB	131.8	5.189	134.8	5.307	189.8	7.472	188	7.402	1.8	.071	10.0	.394	7
					15	Int.	●	MWS0960X15DB	181.8	7.157	184.8	7.276	239.8	9.441	238	9.370	1.8	.071	10.0	.394	7
					20	Int.	★	MWS0960X20DB	231.8	9.126	234.8	9.244	289.8	11.409	288	11.339	1.8	.071	10.0	.394	7
					25	Int.	★	MWS0960X25DB	281.8	11.094	284.8	11.213	339.8	13.378	338	13.307	1.8	.071	10.0	.394	7
					30	Int.	★	MWS0960X30DB	331.8	13.063	334.8	13.181	389.8	15.346	388	15.276	1.8	.071	10.0	.394	7
9.700	.3819		Tube Sheet		2	Ext.	▲	MWE0970SA	44.8	1.764	44.8	1.764	90.8	3.575	89	3.504	1.8	.071	9.7	.382	1
					3	Ext.	▲	MWE0970MA	61.8	2.433	61.8	2.433	106.8	4.205	105	4.134	1.8	.071	9.7	.382	1
					3	Int.	▲	MWS0970MB	51.8	2.039	51.8	2.039	107.8	4.244	106	4.173	1.8	.071	10.0	.394	6
					5	Int.	▲	MWS0970LB	81.8	3.220	81.8	3.220	137.8	5.425	136	5.354	1.8	.071	10.0	.394	6
					8	Int.	▲	MWS0970X8DB	111.8	4.402	111.8	4.402	167.8	6.606	166	6.535	1.8	.071	10.0	.394	6
					10	Int.	★	MWS0970X10DB	131.8	5.189	134.8	5.307	189.8	7.472	188	7.402	1.8	.071	10.0	.394	7
					15	Int.	●	MWS0970X15DB	181.8	7.157	184.8	7.276	239.8	9.441	238	9.370	1.8	.071	10.0	.394	7
					20	Int.	★	MWS0970X20DB	231.8	9.126	234.8	9.244	289.8	11.409	288	11.339	1.8	.071	10.0	.394	7
					25	Int.	★	MWS0970X25DB	281.8	11.094	284.8	11.213	339.8	13.378	338	13.307	1.8	.071	10.0	.394	7
					30	Int.	★	MWS0970X30DB	331.8	13.063	334.8	13.181	389.8	15.346	388	15.276	1.8	.071	10.0	.394	7

DRILLING

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
9.800	.3858		W		2	Ext.	▲	MWE0980SA	44.8	1.764	44.8	1.764	90.8	3.575	89	3.504	1.8	.071	9.8	.386	1
					3	Ext.	▲	MWE0980MA	61.8	2.433	61.8	2.433	106.8	4.205	105	4.134	1.8	.071	9.8	.386	1
					3	Int.	▲	MWS0980MB	51.8	2.039	51.8	2.039	107.8	4.244	106	4.173	1.8	.071	10.0	.394	6
					5	Int.	▲	MWS0980LB	81.8	3.220	81.8	3.220	137.8	5.425	136	5.354	1.8	.071	10.0	.394	6
					8	Int.	▲	MWS0980X8DB	111.8	4.402	111.8	4.402	167.8	6.606	166	6.535	1.8	.071	10.0	.394	6
					10	Int.	●	MWS0980X10DB	131.8	5.189	134.8	5.307	189.8	7.472	188	7.402	1.8	.071	10.0	.394	7
					15	Int.	★	MWS0980X15DB	181.8	7.157	184.8	7.276	239.8	9.441	238	9.370	1.8	.071	10.0	.394	7
					20	Int.	★	MWS0980X20DB	231.8	9.126	234.8	9.244	289.8	11.409	288	11.339	1.8	.071	10.0	.394	7
					25	Int.	★	MWS0980X25DB	281.8	11.094	284.8	11.213	339.8	13.378	338	13.307	1.8	.071	10.0	.394	7
					30	Int.	★	MWS0980X30DB	331.8	13.063	334.8	13.181	389.8	15.346	388	15.276	1.8	.071	10.0	.394	7
9.900	.3898				2	Ext.	▲	MWE0990SA	44.8	1.764	44.8	1.764	90.8	3.575	89	3.504	1.8	.071	9.9	.390	1
					3	Ext.	▲	MWE0990MA	61.8	2.433	61.8	2.433	106.8	4.205	105	4.134	1.8	.071	9.9	.390	1
					3	Int.	▲	MWS0990MB	51.8	2.039	51.8	2.039	107.8	4.244	106	4.173	1.8	.071	10.0	.394	6
					5	Int.	▲	MWS0990LB	81.8	3.220	81.8	3.220	137.8	5.425	136	5.354	1.8	.071	10.0	.394	6
					8	Int.	▲	MWS0990X8DB	111.8	4.402	111.8	4.402	167.8	6.606	166	6.535	1.8	.071	10.0	.394	6
					10	Int.	●	MWS0990X10DB	131.8	5.189	134.8	5.307	189.8	7.472	188	7.402	1.8	.071	10.0	.394	7
					15	Int.	★	MWS0990X15DB	181.8	7.157	184.8	7.276	239.8	9.441	238	9.370	1.8	.071	10.0	.394	7
					20	Int.	★	MWS0990X20DB	231.8	9.126	234.8	9.244	289.8	11.409	288	11.339	1.8	.071	10.0	.394	7
					25	Int.	★	MWS0990X25DB	281.8	11.094	284.8	11.213	339.8	13.378	338	13.307	1.8	.071	10.0	.394	7
					30	Int.	★	MWS0990X30DB	331.8	13.063	334.8	13.181	389.8	15.346	388	15.276	1.8	.071	10.0	.394	7
9.921	.3906	25/64		7/16-20	5	Int.	▲	MWS03906LB	81.8	3.220	81.8	3.220	137.8	5.425	136	5.354	1.8	.071	9.921	.391	6
					8	Int.	▲	MWS03906X8DB	111.8	4.402	111.8	4.402	167.8	6.606	166	6.535	1.8	.071	9.921	.391	6
					15	Int.	●	MWS03906X15DB	181.8	7.157	184.8	7.276	239.8	9.441	238	9.370	1.8	.071	9.921	.391	7
					20	Int.	●	MWS03906X20DB	231.8	9.126	234.8	9.244	289.8	11.409	288	11.339	1.8	.071	9.921	.391	7
					25	Int.	●	MWS03906X25DB	281.8	11.094	284.8	11.213	339.8	13.378	338	13.307	1.8	.071	9.921	.391	7
10.000	.3937				2	Ext.	▲	MWE1000SA	44.8	1.764	44.8	1.764	90.8	3.575	89	3.504	1.8	.071	10.0	.394	1
					3	Ext.	▲	MWE1000MA	61.8	2.433	61.8	2.433	106.8	4.205	105	4.134	1.8	.071	10.0	.394	1
					3	Int.	▲	MWS1000MB	51.8	2.039	51.8	2.039	107.8	4.244	106	4.173	1.8	.071	10.0	.394	6
					5	Int.	▲	MWS1000LB	81.8	3.220	81.8	3.220	137.8	5.425	136	5.354	1.8	.071	10.0	.394	6
					8	Int.	▲	MWS1000X8DB	111.8	4.402	111.8	4.402	167.8	6.606	166	6.535	1.8	.071	10.0	.394	6
					10	Int.	●	MWS1000X10DB	131.8	5.189	134.8	5.307	189.8	7.472	188	7.402	1.8	.071	10.0	.394	7
					15	Int.	●	MWS1000X15DB	181.8	7.157	184.8	7.276	239.8	9.441	238	9.370	1.8	.071	10.0	.394	7
					20	Int.	★	MWS1000X20DB	231.8	9.126	234.8	9.244	289.8	11.409	288	11.339	1.8	.071	10.0	.394	7
					25	Int.	★	MWS1000X25DB	281.8	11.094	284.8	11.213	339.8	13.378	338	13.307	1.8	.071	10.0	.394	7
					30	Int.	●	MWS1000X30DB	331.8	13.063	334.8	13.181	389.8	15.346	388	15.276	1.8	.071	10.0	.394	7
10.100	.3976				2	Ext.	▲	MWE1010SA	44.8	1.764	44.8	1.764	90.8	3.575	89	3.504	1.8	.071	10.1	.398	1
					3	Ext.	▲	MWE1010MA	67.8	2.669	67.8	2.669	113.8	4.480	112	4.409	1.8	.071	10.1	.398	1
					3	Int.	▲	MWS1010MB	54.3	2.138	56.8	2.236	117.8	4.638	116	4.567	1.8	.071	11.0	.433	6
					5	Int.	▲	MWS1010LB	85.8	3.378	89.8	3.535	150.8	5.937	149	5.866	1.8	.071	11.0	.433	6
					8	Int.	▲	MWS1010X8DB	117.8	4.638	122.8	4.835	183.8	7.236	182	7.165	1.8	.071	11.0	.433	6
					10	Int.	★	MWS1010X10DB	138.8	5.465	141.8	5.583	202.8	7.984	201	7.913	1.8	.071	11.0	.433	7
					15	Int.	★	MWS1010X15DB	190.8	7.512	193.8	7.630	254.8	10.031	253	9.961	1.8	.071	11.0	.433	7
					20	Int.	★	MWS1010X20DB	243.8	9.598	246.8	9.717	307.8	12.118	306	12.047	1.8	.071	11.0	.433	7
					25	Int.	★	MWS1010X25DB	295.8	11.646	298.8	11.764	359.8	14.165	358	14.094	1.8	.071	11.0	.433	7

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

▲ : This item to be discontinued within two years.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
10.200	.4016			M12x1.75	2	Ext.	▲	MWE1020SA	44.9	1.768	44.9	1.768	90.9	3.579	89	3.504	1.9	.075	10.2	.402	1
					3	Ext.	▲	MWE1020MA	67.9	2.673	67.9	2.673	113.9	4.484	112	4.409	1.9	.075	10.2	.402	1
					3	Int.	▲	MWS1020MB	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	11.0	.433	6
					5	Int.	▲	MWS1020LB	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	11.0	.433	6
					8	Int.	▲	MWS1020X8DB	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	11.0	.433	6
					10	Int.	★	MWS1020X10DB	138.9	5.469	141.9	5.587	202.9	7.988	201	7.913	1.9	.075	11.0	.433	7
					15	Int.	●	MWS1020X15DB	190.9	7.516	193.9	7.634	254.9	10.035	253	9.961	1.9	.075	11.0	.433	7
					20	Int.	★	MWS1020X20DB	243.9	9.602	246.9	9.720	307.9	12.122	306	12.047	1.9	.075	11.0	.433	7
					25	Int.	★	MWS1020X25DB	295.9	11.650	298.9	11.768	359.9	14.169	358	14.094	1.9	.075	11.0	.433	7
10.300	.4055				2	Ext.	▲	MWE1030SA	44.9	1.768	44.9	1.768	90.9	3.579	89	3.504	1.9	.075	10.3	.406	1
					3	Ext.	▲	MWE1030MA	67.9	2.673	67.9	2.673	113.9	4.484	112	4.409	1.9	.075	10.3	.406	1
					3	Int.	▲	MWS1030MB	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	11.0	.433	6
					5	Int.	▲	MWS1030LB	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	11.0	.433	6
					8	Int.	▲	MWS1030X8DB	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	11.0	.433	6
					10	Int.	★	MWS1030X10DB	138.9	5.469	141.9	5.587	202.9	7.988	201	7.913	1.9	.075	11.0	.433	7
					15	Int.	★	MWS1030X15DB	190.9	7.516	193.9	7.634	254.9	10.035	253	9.961	1.9	.075	11.0	.433	7
					20	Int.	★	MWS1030X20DB	243.9	9.602	246.9	9.720	307.9	12.122	306	12.047	1.9	.075	11.0	.433	7
					25	Int.	★	MWS1030X25DB	295.9	11.650	298.9	11.768	359.9	14.169	358	14.094	1.9	.075	11.0	.433	7
10.317	.4062	13/32			5	Int.	▲	MWS04062LB	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	10.716	.422	6
					8	Int.	▲	MWS04062X8DB	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	10.716	.422	6
					15	Int.	●	MWS04062X15DB	190.9	7.516	193.9	7.634	254.9	10.035	253	9.961	1.9	.075	10.716	.422	7
					20	Int.	●	MWS04062X20DB	243.9	9.602	246.9	9.720	307.9	12.122	306	12.047	1.9	.075	10.716	.422	7
10.400	.4094				2	Ext.	▲	MWE1040SA	44.9	1.768	44.9	1.768	90.9	3.579	89	3.504	1.9	.075	10.4	.409	1
					3	Ext.	▲	MWE1040MA	67.9	2.673	67.9	2.673	113.9	4.484	112	4.409	1.9	.075	10.4	.409	1
					3	Int.	▲	MWS1040MB	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	11.0	.433	6
					5	Int.	▲	MWS1040LB	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	11.0	.433	6
					8	Int.	▲	MWS1040X8DB	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	11.0	.433	6
					10	Int.	★	MWS1040X10DB	138.9	5.469	141.9	5.587	202.9	7.988	201	7.913	1.9	.075	11.0	.433	7
					15	Int.	★	MWS1040X15DB	190.9	7.516	193.9	7.634	254.9	10.035	253	9.961	1.9	.075	11.0	.433	7
					20	Int.	★	MWS1040X20DB	243.9	9.602	246.9	9.720	307.9	12.122	306	12.047	1.9	.075	11.0	.433	7
					25	Int.	★	MWS1040X25DB	295.9	11.650	298.9	11.768	359.9	14.169	358	14.094	1.9	.075	11.0	.433	7
10.500	.4134		Z		2	Ext.	▲	MWE1050SA	44.9	1.768	44.9	1.768	90.9	3.579	89	3.504	1.9	.075	10.5	.413	1
					3	Ext.	▲	MWE1050MA	67.9	2.673	67.9	2.673	113.9	4.484	112	4.409	1.9	.075	10.5	.413	1
					3	Int.	▲	MWS1050MB	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	11.0	.433	6
					5	Int.	▲	MWS1050LB	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	11.0	.433	6
					8	Int.	▲	MWS1050X8DB	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	11.0	.433	6
					10	Int.	★	MWS1050X10DB	138.9	5.469	141.9	5.587	202.9	7.988	201	7.913	1.9	.075	11.0	.433	7
					15	Int.	●	MWS1050X15DB	190.9	7.516	193.9	7.634	254.9	10.035	253	9.961	1.9	.075	11.0	.433	7
					20	Int.	★	MWS1050X20DB	243.9	9.602	246.9	9.720	307.9	12.122	306	12.047	1.9	.075	11.0	.433	7
					25	Int.	★	MWS1050X25DB	295.9	11.650	298.9	11.768	359.9	14.169	358	14.094	1.9	.075	11.0	.433	7
10.600	.4173				2	Ext.	▲	MWE1060SA	44.9	1.768	44.9	1.768	90.9	3.579	89	3.504	1.9	.075	10.6	.417	1
					3	Ext.	▲	MWE1060MA	69.9	2.752	69.9	2.752	115.9	4.563	114	4.488	1.9	.075	10.6	.417	1
					3	Int.	▲	MWS1060MB	56.9	2.240	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	11.0	.433	6
					5	Int.	▲	MWS1060LB	89.9	3.539	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	11.0	.433	6
					8	Int.	▲	MWS1060X8DB	122.9	4.839	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	11.0	.433	6
					10	Int.	●	MWS1060X10DB	144.9	5.705	147.9	5.823	208.9	8.224	207	8.150	1.9	.075	11.0	.433	7
					15	Int.	★	MWS1060X15DB	199.9	7.870	202.9	7.988	263.9	10.390	262	10.315	1.9	.075	11.0	.433	7
					20	Int.	★	MWS1060X20DB	254.9	10.035	257.9	10.154	318.9	12.555	317	12.480	1.9	.075	11.0	.433	7
					25	Int.	★	MWS1060X25DB	309.9	12.201	312.9	12.319	373.9	14.720	372	14.646	1.9	.075	11.0	.433	7

CUTTING CONDITIONS ➤ L088
HOW TO USE ➤ L094
TECHNICAL DATA ➤ N001

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
10.700	.4213				2	Ext.	▲	MWE1070SA	49.0	1.929	49.0	1.929	97.0	3.819	95	3.740	2.0	.079	10.7	.421	1
					3	Ext.	▲	MWE1070MA	70.0	2.756	70.0	2.756	116.0	4.567	114	4.488	2.0	.079	10.7	.421	1
					3	Int.	▲	MWS1070MB	57.0	2.244	57.0	2.244	118.0	4.646	116	4.567	2.0	.079	11.0	.433	6
					5	Int.	▲	MWS1070LB	90.0	3.543	90.0	3.543	151.0	5.945	149	5.866	2.0	.079	11.0	.433	6
					8	Int.	▲	MWS1070X8DB	123.0	4.843	123.0	4.843	184.0	7.244	182	7.165	2.0	.079	11.0	.433	6
					10	Int.	●	MWS1070X10DB	145.0	5.709	148.0	5.827	209.0	8.228	207	8.150	2.0	.079	11.0	.433	7
					15	Int.	★	MWS1070X15DB	200.0	7.874	203.0	7.992	264.0	10.394	262	10.315	2.0	.079	11.0	.433	7
					20	Int.	●	MWS1070X20DB	255.0	10.039	258.0	10.157	319.0	12.559	317	12.480	2.0	.079	11.0	.433	7
					25	Int.	★	MWS1070X25DB	310.0	12.205	313.0	12.323	374.0	14.724	372	14.646	2.0	.079	11.0	.433	7
10.716	.4219	27/64		1/2-13	5	Int.	▲	MWS04219LB	90.0	3.543	90.0	3.543	151.0	5.945	149	5.866	2.0	.079	10.716	.422	6
					8	Int.	▲	MWS04219X8DB	123.0	4.843	123.0	4.843	184.0	7.244	182	7.165	2.0	.079	10.716	.422	6
					15	Int.	●	MWS04219X15DB	200.0	7.874	203.0	7.992	264.0	10.394	262	10.315	2.0	.079	10.716	.422	7
					20	Int.	●	MWS04219X20DB	255.0	10.039	258.0	10.157	319.0	12.559	317	12.480	2.0	.079	10.716	.422	7
10.800	.4252			M12x1.25	2	Ext.	▲	MWE1080SA	49.0	1.929	49.0	1.929	97.0	3.819	95	3.740	2.0	.079	10.8	.425	1
					3	Ext.	▲	MWE1080MA	70.0	2.756	70.0	2.756	116.0	4.567	114	4.488	2.0	.079	10.8	.425	1
					3	Int.	▲	MWS1080MB	57.0	2.244	57.0	2.244	118.0	4.646	116	4.567	2.0	.079	11.0	.433	6
					5	Int.	▲	MWS1080LB	90.0	3.543	90.0	3.543	151.0	5.945	149	5.866	2.0	.079	11.0	.433	6
					8	Int.	▲	MWS1080X8DB	123.0	4.843	123.0	4.843	184.0	7.244	182	7.165	2.0	.079	11.0	.433	6
					10	Int.	●	MWS1080X10DB	145.0	5.709	148.0	5.827	209.0	8.228	207	8.150	2.0	.079	11.0	.433	7
					15	Int.	★	MWS1080X15DB	200.0	7.874	203.0	7.992	264.0	10.394	262	10.315	2.0	.079	11.0	.433	7
					20	Int.	●	MWS1080X20DB	255.0	10.039	258.0	10.157	319.0	12.559	317	12.480	2.0	.079	11.0	.433	7
					25	Int.	★	MWS1080X25DB	310.0	12.205	313.0	12.323	374.0	14.724	372	14.646	2.0	.079	11.0	.433	7
10.900	.4291				2	Ext.	▲	MWE1090SA	49.0	1.929	49.0	1.929	97.0	3.819	95	3.740	2.0	.079	10.9	.429	1
					3	Ext.	▲	MWE1090MA	70.0	2.756	70.0	2.756	116.0	4.567	114	4.488	2.0	.079	10.9	.429	1
					3	Int.	▲	MWS1090MB	57.0	2.244	57.0	2.244	118.0	4.646	116	4.567	2.0	.079	11.0	.433	6
					5	Int.	▲	MWS1090LB	90.0	3.543	90.0	3.543	151.0	5.945	149	5.866	2.0	.079	11.0	.433	6
					8	Int.	▲	MWS1090X8DB	123.0	4.843	123.0	4.843	184.0	7.244	182	7.165	2.0	.079	11.0	.433	7
					10	Int.	●	MWS1090X10DB	145.0	5.709	148.0	5.827	209.0	8.228	207	8.150	2.0	.079	11.0	.433	7
					15	Int.	★	MWS1090X15DB	200.0	7.874	203.0	7.992	264.0	10.394	262	10.315	2.0	.079	11.0	.433	7
					20	Int.	★	MWS1090X20DB	255.0	10.039	258.0	10.157	319.0	12.559	317	12.480	2.0	.079	11.0	.433	7
					25	Int.	★	MWS1090X25DB	310.0	12.205	313.0	12.323	374.0	14.724	372	14.646	2.0	.079	11.0	.433	7
11.000	.4331				2	Ext.	▲	MWE1100SA	49.0	1.929	49.0	1.929	97.0	3.819	95	3.740	2.0	.079	11.0	.433	1
					3	Ext.	▲	MWE1100MA	70.0	2.756	70.0	2.756	116.0	4.567	114	4.488	2.0	.079	11.0	.433	1
					3	Int.	▲	MWS1100MB	57.0	2.244	57.0	2.244	118.0	4.646	116	4.567	2.0	.079	11.0	.433	6
					5	Int.	▲	MWS1100LB	90.0	3.543	90.0	3.543	151.0	5.945	149	5.866	2.0	.079	11.0	.433	6
					8	Int.	▲	MWS1100X8DB	123.0	4.843	123.0	4.843	184.0	7.244	182	7.165	2.0	.079	11.0	.433	6
					10	Int.	●	MWS1100X10DB	145.0	5.709	148.0	5.827	209.0	8.228	207	8.150	2.0	.079	11.0	.433	7
					15	Int.	●	MWS1100X15DB	200.0	7.874	203.0	7.992	264.0	10.394	262	10.315	2.0	.079	11.0	.433	7
					20	Int.	★	MWS1100X20DB	255.0	10.039	258.0	10.157	319.0	12.559	317	12.480	2.0	.079	11.0	.433	7
					25	Int.	●	MWS1100X25DB	310.0	12.205	313.0	12.323	374.0	14.724	372	14.646	2.0	.079	11.0	.433	7

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

▲ : This item to be discontinued within two years.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
11.100	.4370				2	Ext.	▲	MWE1110SA	49.0	1.929	49.0	1.929	97.0	3.819	95	3.740	2.0	.079	11.1	.437	1
					3	Ext.	▲	MWE1110MA	73.0	2.874	73.0	2.874	120.0	4.724	118	4.646	2.0	.079	11.1	.437	1
					3	Int.	▲	MWS1110MB	59.5	2.343	62.0	2.441	124.0	4.882	122	4.803	2.0	.079	12.0	.472	6
					5	Int.	▲	MWS1110LB	94.0	3.701	98.0	3.858	160.0	6.299	158	6.220	2.0	.079	12.0	.472	6
					8	Int.	▲	MWS1110X8DB	129.0	5.079	134.0	5.276	196.0	7.717	194	7.638	2.0	.079	12.0	.472	6
					10	Int.	●	MWS1110X10DB	152.0	5.984	155.0	6.102	217.0	8.543	215	8.465	2.0	.079	12.0	.472	7
					15	Int.	★	MWS1110X15DB	209.0	8.228	212.0	8.346	274.0	10.787	272	10.709	2.0	.079	12.0	.472	7
					20	Int.	●	MWS1110X20DB	267.0	10.512	270.0	10.630	332.0	13.071	330	12.992	2.0	.079	12.0	.472	7
					25	Int.	★	MWS1110X25DB	324.0	12.756	327.0	12.874	389.0	15.315	387	15.236	2.0	.079	12.0	.472	7
11.113	.4375	7/16			5	Int.	▲	MWS04375LB	94.0	3.701	98.0	3.858	160.0	6.299	158	6.220	2.0	.079	11.908	.469	6
					8	Int.	▲	MWS04375X8DB	129.0	5.079	134.0	5.276	196.0	7.717	194	7.638	2.0	.079	11.908	.469	6
					15	Int.	●	MWS04375X15DB	209.0	8.228	212.0	8.346	274.0	10.787	272	10.709	2.0	.079	11.908	.469	7
					20	Int.	●	MWS04375X20DB	267.0	10.512	270.0	10.630	332.0	13.071	330	12.992	2.0	.079	11.908	.469	7
11.200	.4409				2	Ext.	▲	MWE1120SA	49.0	1.929	49.0	1.929	97.0	3.819	95	3.740	2.0	.079	11.2	.441	1
					3	Ext.	▲	MWE1120MA	73.0	2.874	73.0	2.874	120.0	4.724	118	4.646	2.0	.079	11.2	.441	1
					3	Int.	▲	MWS1120MB	59.5	2.343	62.0	2.441	124.0	4.882	122	4.803	2.0	.079	12.0	.472	6
					5	Int.	▲	MWS1120LB	94.0	3.701	98.0	3.858	160.0	6.299	158	6.220	2.0	.079	12.0	.472	6
					8	Int.	▲	MWS1120X8DB	129.0	5.079	134.0	5.276	196.0	7.717	194	7.638	2.0	.079	12.0	.472	6
					10	Int.	★	MWS1120X10DB	152.0	5.984	155.0	6.102	217.0	8.543	215	8.465	2.0	.079	12.0	.472	7
					15	Int.	●	MWS1120X15DB	209.0	8.228	212.0	8.346	274.0	10.787	272	10.709	2.0	.079	12.0	.472	7
					20	Int.	★	MWS1120X20DB	267.0	10.512	270.0	10.630	332.0	13.071	330	12.992	2.0	.079	12.0	.472	7
					25	Int.	★	MWS1120X25DB	324.0	12.756	327.0	12.874	389.0	15.315	387	15.236	2.0	.079	12.0	.472	7
11.300	.4449				2	Ext.	▲	MWE1130SA	49.1	1.933	49.1	1.933	97.1	3.823	95	3.740	2.1	.083	11.3	.445	1
					3	Ext.	▲	MWE1130MA	73.1	2.878	73.1	2.878	120.1	4.728	118	4.646	2.1	.083	11.3	.445	1
					3	Int.	▲	MWS1130MB	59.6	2.346	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12.0	.472	6
					5	Int.	▲	MWS1130LB	94.1	3.705	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12.0	.472	6
					8	Int.	▲	MWS1130X8DB	129.1	5.083	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12.0	.472	6
					10	Int.	★	MWS1130X10DB	152.1	5.988	155.1	6.106	217.1	8.547	215	8.465	2.1	.083	12.0	.472	7
					15	Int.	★	MWS1130X15DB	209.1	8.232	212.1	8.350	274.1	10.791	272	10.709	2.1	.083	12.0	.472	7
					20	Int.	★	MWS1130X20DB	267.1	10.516	270.1	10.634	332.1	13.075	330	12.992	2.1	.083	12.0	.472	7
					25	Int.	★	MWS1130X25DB	324.1	12.760	327.1	12.878	389.1	15.319	387	15.236	2.1	.083	12.0	.472	7
11.400	.4488				2	Ext.	▲	MWE1140SA	49.1	1.933	49.1	1.933	97.1	3.823	95	3.740	2.1	.083	11.4	.449	1
					3	Ext.	▲	MWE1140MA	73.1	2.878	73.1	2.878	120.1	4.728	118	4.646	2.1	.083	11.4	.449	1
					3	Int.	▲	MWS1140MB	59.6	2.346	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12.0	.472	6
					5	Int.	▲	MWS1140LB	94.1	3.705	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12.0	.472	6
					8	Int.	▲	MWS1140X8DB	129.1	5.083	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12.0	.472	6
					10	Int.	★	MWS1140X10DB	152.1	5.988	155.1	6.106	217.1	8.547	215	8.465	2.1	.083	12.0	.472	6
					15	Int.	★	MWS1140X15DB	209.1	8.232	212.1	8.350	274.1	10.791	272	10.709	2.1	.083	12.0	.472	7
					20	Int.	★	MWS1140X20DB	267.1	10.516	270.1	10.634	332.1	13.075	330	12.992	2.1	.083	12.0	.472	7
					25	Int.	★	MWS1140X25DB	324.1	12.760	327.1	12.878	389.1	15.319	387	15.236	2.1	.083	12.0	.472	7

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
11.500	.4528				2	Ext.	▲	MWE1150SA	49.1	1.933	49.1	1.933	97.1	3.823	95	3.740	2.1	.083	11.5	.453	1
					3	Ext.	▲	MWE1150MA	73.1	2.878	73.1	2.878	120.1	4.728	118	4.646	2.1	.083	11.5	.453	1
					3	Int.	▲	MWS1150MB	59.6	2.346	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12.0	.472	6
					5	Int.	▲	MWS1150LB	94.1	3.705	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12.0	.472	6
					8	Int.	▲	MWS1150X8DB	129.1	5.083	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12.0	.472	6
					10	Int.	★	MWS1150X10DB	152.1	5.988	155.1	6.106	217.1	8.547	215	8.465	2.1	.083	12.0	.472	7
					15	Int.	★	MWS1150X15DB	209.1	8.232	212.1	8.350	274.1	10.791	272	10.709	2.1	.083	12.0	.472	7
					20	Int.	★	MWS1150X20DB	267.1	10.516	270.1	10.634	332.1	13.075	330	12.992	2.1	.083	12.0	.472	7
					25	Int.	●	MWS1150X25DB	324.1	12.760	327.1	12.878	389.1	15.319	387	15.236	2.1	.083	12.0	.472	7
11.509	.4531	29/64		1/2-20	5	Int.	▲	MWS04531LB	98.1	3.862	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	11.908	.469	6
					8	Int.	▲	MWS04531X8DB	134.1	5.280	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	11.908	.469	6
					15	Int.	●	MWS04531X15DB	218.1	8.587	221.1	8.705	283.1	11.146	281	11.063	2.1	.083	11.908	.469	7
					20	Int.	●	MWS04531X20DB	278.1	10.949	281.1	11.067	343.1	13.508	341	13.425	2.1	.083	11.908	.469	7
11.600	.4567				2	Ext.	▲	MWE1160SA	49.1	1.933	49.1	1.933	97.1	3.823	95	3.740	2.1	.083	11.6	.457	1
					3	Ext.	▲	MWE1160MA	75.1	2.957	75.1	2.957	123.1	4.846	121	4.764	2.1	.083	11.6	.457	1
					3	Int.	▲	MWS1160MB	62.1	2.445	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12.0	.472	6
					5	Int.	▲	MWS1160LB	98.1	3.862	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12.0	.472	6
					8	Int.	▲	MWS1160X8DB	134.1	5.280	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12.0	.472	6
					10	Int.	★	MWS1160X10DB	158.1	6.224	161.1	6.343	223.1	8.783	221	8.701	2.1	.083	12.0	.472	7
					15	Int.	★	MWS1160X15DB	218.1	8.587	221.1	8.705	283.1	11.146	281	11.063	2.1	.083	12.0	.472	7
					20	Int.	★	MWS1160X20DB	278.1	10.949	281.1	11.067	343.1	13.508	341	13.425	2.1	.083	12.0	.472	7
					25	Int.	★	MWS1160X25DB	338.1	13.311	341.1	13.429	403.1	15.870	401	15.787	2.1	.083	12.0	.472	7
11.700	.4606				2	Ext.	▲	MWE1170SA	49.1	1.933	49.1	1.933	97.1	3.823	95	3.740	2.1	.083	11.7	.461	1
					3	Ext.	▲	MWE1170MA	75.1	2.957	75.1	2.957	123.1	4.846	121	4.764	2.1	.083	11.7	.461	1
					3	Int.	▲	MWS1170MB	62.1	2.445	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12.0	.472	6
					5	Int.	▲	MWS1170LB	98.1	3.862	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12.0	.472	6
					8	Int.	▲	MWS1170X8DB	134.1	5.280	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12.0	.472	6
					10	Int.	★	MWS1170X10DB	158.1	6.224	161.1	6.343	223.1	8.783	221	8.701	2.1	.083	12.0	.472	7
					15	Int.	★	MWS1170X15DB	218.1	8.587	221.1	8.705	283.1	11.146	281	11.063	2.1	.083	12.0	.472	7
					20	Int.	★	MWS1170X20DB	278.1	10.949	281.1	11.067	343.1	13.508	341	13.425	2.1	.083	12.0	.472	7
					25	Int.	★	MWS1170X25DB	338.1	13.311	341.1	13.429	403.1	15.870	401	15.787	2.1	.083	12.0	.472	7
11.800	.4646				2	Ext.	▲	MWE1180SA	49.2	1.937	49.2	1.937	97.2	3.827	95	3.740	2.2	.087	11.8	.465	1
					3	Ext.	▲	MWE1180MA	75.2	2.961	75.2	2.961	123.2	4.850	121	4.764	2.2	.087	11.8	.465	1
					3	Int.	▲	MWS1180MB	62.2	2.449	62.2	2.449	124.2	4.890	122	4.803	2.2	.087	12.0	.472	6
					5	Int.	▲	MWS1180LB	98.2	3.866	98.2	3.866	160.2	6.307	158	6.220	2.2	.087	12.0	.472	6
					8	Int.	▲	MWS1180X8DB	134.2	5.283	134.2	5.283	196.2	7.724	194	7.638	2.2	.087	12.0	.472	6
					10	Int.	★	MWS1180X10DB	158.2	6.228	161.2	6.346	223.2	8.787	221	8.701	2.2	.087	12.0	.472	7
					15	Int.	★	MWS1180X15DB	218.2	8.591	221.2	8.709	283.2	11.150	281	11.063	2.2	.087	12.0	.472	7
					20	Int.	★	MWS1180X20DB	278.2	10.953	281.2	11.071	343.2	13.512	341	13.425	2.2	.087	12.0	.472	7
					25	Int.	●	MWS1180X25DB	338.2	13.315	341.2	13.433	403.2	15.874	401	15.787	2.2	.087	12.0	.472	7
11.900	.4685				2	Ext.	▲	MWE1190SA	53.2	2.094	53.2	2.094	104.2	4.102	102	4.016	2.2	.087	11.9	.469	1
					3	Ext.	▲	MWE1190MA	75.2	2.961	75.2	2.961	123.2	4.850	121	4.764	2.2	.087	11.9	.469	1
					3	Int.	▲	MWS1190MB	62.2	2.449	62.2	2.449	124.2	4.890	122	4.803	2.2	.087	12.0	.472	6
					5	Int.	▲	MWS1190LB	98.2	3.866	98.2	3.866	160.2	6.307	158	6.220	2.2	.087	12.0	.472	6
					8	Int.	▲	MWS1190X8DB	134.2	5.283	134.2	5.283	196.2	7.724	194	7.638	2.2	.087	12.0	.472	6
					10	Int.	●	MWS1190X10DB	158.2	6.228	161.2	6.346	223.2	8.787	221	8.701	2.2	.087	12.0	.472	7
					15	Int.	★	MWS1190X15DB	218.2	8.591	221.2	8.709	283.2	11.150	281	11.063	2.2	.087	12.0	.472	7
					20	Int.	★	MWS1190X20DB	278.2	10.953	281.2	11.071	343.2	13.512	341	13.425	2.2	.087	12.0	.472	7
					25	Int.	★	MWS1190X25DB	338.2	13.315	341.2	13.433	403.2	15.874	401	15.787	2.2	.087	12.0	.472	7

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DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
11.908	.4688	15/32			5	Int.	▲	MWS04688LB	98.2	3.866	98.2	3.866	160.2	6.307	158	6.220	2.2	.087	11.908	.469	6
					8	Int.	▲	MWS04688X8DB	134.2	5.283	134.2	5.283	196.2	7.724	194	7.638	2.2	.087	11.908	.469	6
					15	Int.	●	MWS04688X15DB	218.2	8.591	221.2	8.709	283.2	11.150	281	11.063	2.2	.087	11.908	.469	7
					20	Int.	●	MWS04688X20DB	278.2	10.953	281.2	11.071	343.2	13.512	341	13.425	2.2	.087	11.908	.469	7
12.000	.4724			M14x2.0	2	Ext.	▲	MWE1200SA	53.2	2.094	53.2	2.094	104.2	4.102	102	4.016	2.2	.087	12.0	.472	1
					3	Ext.	▲	MWE1200MA	75.2	2.961	75.2	2.961	123.2	4.850	121	4.764	2.2	.087	12.0	.472	1
					3	Int.	▲	MWS1200MB	62.2	2.449	62.2	2.449	124.2	4.890	122	4.803	2.2	.087	12.0	.472	6
					5	Int.	▲	MWS1200LB	98.2	3.866	98.2	3.866	160.2	6.307	158	6.220	2.2	.087	12.0	.472	6
					8	Int.	▲	MWS1200X8DB	134.2	5.283	134.2	5.283	196.2	7.724	194	7.638	2.2	.087	12.0	.472	6
					10	Int.	●	MWS1200X10DB	158.2	6.228	161.2	6.346	223.2	8.787	221	8.701	2.2	.087	12.0	.472	7
					15	Int.	★	MWS1200X15DB	218.2	8.591	221.2	8.709	283.2	11.150	281	11.063	2.2	.087	12.0	.472	7
					20	Int.	★	MWS1200X20DB	278.2	10.953	281.2	11.071	343.2	13.512	341	13.425	2.2	.087	12.0	.472	7
					25	Int.	●	MWS1200X25DB	338.2	13.315	341.2	13.433	403.2	15.874	401	15.787	2.2	.087	12.0	.472	7
12.100	.4764				2	Ext.	▲	MWE1210SA	53.2	2.094	53.2	2.094	104.2	4.102	102	4.016	2.2	.087	12.1	.476	1
					3	Ext.	▲	MWE1210MA	78.2	3.079	78.2	3.079	137.2	5.402	135	5.315	2.2	.087	12.1	.476	1
					3	Int.	▲	MWS1210MB	64.7	2.547	67.2	2.646	130.2	5.126	128	5.039	2.2	.087	13.0	.512	6
					5	Int.	▲	MWS1210LB	102.2	4.024	106.2	4.181	169.2	6.661	167	6.575	2.2	.087	13.0	.512	6
					10	Int.	□	MWS1210X10DB	165.2	6.504	168.2	6.622	231.2	9.102	229	9.016	2.2	.087	13.0	.512	7
					15	Int.	□	MWS1210X15DB	227.2	8.945	230.2	9.063	293.2	11.543	291	11.457	2.2	.087	13.0	.512	7
					20	Int.	□	MWS1210X20DB	290.2	11.425	293.2	11.543	356.2	14.024	354	13.937	2.2	.087	13.0	.512	7
12.200	.4803				2	Ext.	▲	MWE1220SA	53.2	2.094	53.2	2.094	104.2	4.102	102	4.016	2.2	.087	12.2	.480	1
					3	Ext.	▲	MWE1220MA	78.2	3.079	78.2	3.079	137.2	5.402	135	5.315	2.2	.087	12.2	.480	1
					3	Int.	▲	MWS1220MB	64.7	2.547	67.2	2.646	130.2	5.126	128	5.039	2.2	.087	13.0	.512	6
					5	Int.	▲	MWS1220LB	102.2	4.024	106.2	4.181	169.2	6.661	167	6.575	2.2	.087	13.0	.512	6
					10	Int.	□	MWS1220X10DB	165.2	6.504	168.2	6.622	231.2	9.102	229	9.016	2.2	.087	13.0	.512	7
					15	Int.	□	MWS1220X15DB	227.2	8.945	230.2	9.063	293.2	11.543	291	11.457	2.2	.087	13.0	.512	7
					20	Int.	□	MWS1220X20DB	290.2	11.425	293.2	11.543	356.2	14.024	354	13.937	2.2	.087	13.0	.512	7
12.300	.4843			9/16-32	2	Ext.	▲	MWE1230SA	53.2	2.094	53.2	2.094	104.2	4.102	102	4.016	2.2	.087	12.3	.484	1
					3	Ext.	▲	MWE1230MA	78.2	3.079	78.2	3.079	137.2	5.402	135	5.315	2.2	.087	12.3	.484	1
					3	Int.	▲	MWS1230MB	64.7	2.547	67.2	2.646	130.2	5.126	128	5.039	2.2	.087	13.0	.512	6
					5	Int.	▲	MWS1230LB	102.2	4.024	106.2	4.181	169.2	6.661	167	6.575	2.2	.087	13.0	.512	6
					10	Int.	□	MWS1230X10DB	165.2	6.504	168.2	6.622	231.2	9.102	229	9.016	2.2	.087	13.0	.512	7
					15	Int.	□	MWS1230X15DB	227.2	8.945	230.2	9.063	293.2	11.543	291	11.457	2.2	.087	13.0	.512	7
					20	Int.	□	MWS1230X20DB	290.2	11.425	293.2	11.543	356.2	14.024	354	13.937	2.2	.087	13.0	.512	7
12.304	.4844	31/64		9/16-32	5	Int.	▲	MWS04844LB	102.2	4.024	106.2	4.181	169.2	6.661	167	6.575	2.2	.087	12.7	.500	6
					8	Int.	▲	MWS04844X8DB	140.2	5.520	145.2	5.717	208.2	8.197	206	8.110	2.2	.087	12.7	.500	6
					15	Int.	●	MWS04844X15DB	227.2	8.945	230.2	9.063	293.2	11.543	291	11.457	2.2	.087	12.7	.500	7
12.400	.4882				2	Ext.	▲	MWE1240SA	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	12.4	.488	1
					3	Ext.	▲	MWE1240MA	78.3	3.083	78.3	3.083	137.3	5.406	135	5.315	2.3	.091	12.4	.488	1
					3	Int.	▲	MWS1240MB	64.8	2.551	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	13.0	.512	6
					5	Int.	▲	MWS1240LB	102.3	4.028	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13.0	.512	6
					10	Int.	□	MWS1240X10DB	165.3	6.508	168.3	6.626	231.3	9.106	229	9.016	2.3	.091	13.0	.512	7
					15	Int.	□	MWS1240X15DB	227.3	8.949	230.3	9.067	293.3	11.547	291	11.457	2.3	.091	13.0	.512	7
					20	Int.	□	MWS1240X20DB	290.3	11.429	293.3	11.547	356.3	14.028	354	13.937	2.3	.091	13.0	.512	7

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
12.500	.4921			M14x1.5	2	Ext.	▲	MWE1250SA	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	12.5	.492	1
					3	Ext.	▲	MWE1250MA	78.3	3.083	78.3	3.083	137.3	5.406	135	5.315	2.3	.091	12.5	.492	1
					3	Int.	▲	MWS1250MB	64.8	2.551	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	13.0	.512	6
					5	Int.	▲	MWS1250LB	102.3	4.028	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13.0	.512	6
					8	Int.	▲	MWS1250X8DB	140.3	5.524	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	13.0	.512	6
					10	Int.	●	MWS1250X10DB	165.3	6.508	168.3	6.626	231.3	9.106	229	9.016	2.3	.091	13.0	.512	7
					15	Int.	●	MWS1250X15DB	227.3	8.949	230.3	9.067	293.3	11.547	291	11.457	2.3	.091	13.0	.512	7
					20	Int.	★	MWS1250X20DB	290.3	11.429	293.3	11.547	356.3	14.028	354	13.937	2.3	.091	13.0	.512	7
12.600	.4961				2	Ext.	▲	MWE1260SA	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	12.6	.496	1
					3	Ext.	▲	MWE1260MA	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	12.6	.496	1
					3	Int.	▲	MWS1260MB	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	13.0	.512	6
					5	Int.	▲	MWS1260LB	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13.0	.512	6
					10	Int.	□	MWS1260X10DB	171.3	6.744	174.3	6.862	237.3	9.343	235	9.252	2.3	.091	13.0	.512	7
					15	Int.	□	MWS1260X15DB	236.3	9.303	239.3	9.421	302.3	11.902	300	11.811	2.3	.091	13.0	.512	7
					20	Int.	□	MWS1260X20DB	301.3	11.862	304.3	11.980	367.3	14.461	365	14.370	2.3	.091	13.0	.512	7
12.700	.5000	1/2			2	Ext.	▲	MWE1270SA	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	12.700	.500	1
					3	Ext.	▲	MWE1270MA	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	12.700	.500	1
					3	Int.	▲	MWS1270MB	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	13.0	.512	6
					5	Int.	▲	MWS05000LB	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	12.700	.500	6
					5	Int.	▲	MWS1270LB	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13.0	.512	6
					8	Int.	▲	MWS05000X8DB	145.3	5.720	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	12.700	.500	6
					10	Int.	□	MWS1270X10DB	171.3	6.744	174.3	6.862	237.3	9.343	235	9.252	2.3	.091	13.0	.512	7
					15	Int.	●	MWS05000X15DB	236.3	9.303	239.3	9.421	302.3	11.902	300	11.811	2.3	.091	12.700	.500	7
					15	Int.	□	MWS1270X15DB	236.3	9.303	239.3	9.421	302.3	11.902	300	11.811	2.3	.091	13.0	.512	7
					20	Int.	●	MWS1270X20DB	301.3	11.862	304.3	11.980	367.3	14.461	365	14.370	2.3	.091	13.0	.512	7
12.8	.5039				2	Ext.	▲	MWE1280SA	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	12.8	.504	1
					3	Ext.	▲	MWE1280MA	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	12.8	.504	1
					3	Int.	▲	MWS1280MB	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	13.0	.512	6
					5	Int.	▲	MWS1280LB	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13.0	.512	6
					10	Int.	□	MWS1280X10DB	171.3	6.744	174.3	6.862	237.3	9.343	235	9.252	2.3	.091	13.0	.512	6
					15	Int.	□	MWS1280X15DB	236.3	9.303	239.3	9.421	302.3	11.902	300	11.811	2.3	.091	13.0	.512	7
					20	Int.	□	MWS1280X20DB	301.3	11.862	304.3	11.980	367.3	14.461	365	14.370	2.3	.091	13.0	.512	7
12.827	.5050		Tube Sheet		5	Int.	▲	MWS05050LB	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13.0	.512	6
12.9	.5079				2	Ext.	▲	MWE1290SA	53.4	2.102	53.4	2.102	104.4	4.110	102	4.016	2.4	.094	12.9	.508	1
					3	Ext.	▲	MWE1290MA	80.4	3.165	80.4	3.165	139.4	5.488	137	5.394	2.4	.094	12.9	.508	1
					3	Int.	▲	MWS1290MB	67.4	2.654	67.4	2.654	130.4	5.134	128	5.039	2.4	.094	13.0	.512	6
					5	Int.	▲	MWS1290LB	106.4	4.189	106.4	4.189	169.4	6.669	167	6.575	2.4	.094	13.0	.512	6
					10	Int.	□	MWS1290X10DB	171.4	6.748	174.4	6.866	237.4	9.346	235	9.252	2.4	.094	13.0	.512	7
					15	Int.	□	MWS1290X15DB	236.4	9.307	239.4	9.425	302.4	11.906	300	11.811	2.4	.094	13.0	.512	7
					20	Int.	□	MWS1290X20DB	301.4	11.866	304.4	11.984	367.4	14.465	365	14.370	2.4	.094	13.0	.512	7

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DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	▲	MWE1300SA	53.4	2.102	53.4	2.102	104.4	4.110	102	4.016	2.4	.094	13.0	.512	1
					3	Ext.	▲	MWE1300MA	80.4	3.165	80.4	3.165	139.4	5.488	137	5.394	2.4	.094	13.0	.512	1
					3	Int.	▲	MWS1300MB	67.4	2.654	67.4	2.654	130.4	5.134	128	5.039	2.4	.094	13.0	.512	6
					5	Int.	▲	MWS1300LB	106.4	4.189	106.4	4.189	169.4	6.669	167	6.575	2.4	.094	13.0	.512	6
13.0	.5118				5	Int.	▲	MWS05118LB	106.4	4.189	106.4	4.189	169.4	6.669	167	6.575	2.4	.094	13.0	.512	6
					8	Int.	▲	MWS1300X8DB	145.4	5.724	145.4	5.724	208.4	8.205	206	8.110	2.4	.094	13.0	.512	6
					10	Int.	●	MWS1300X10DB	171.4	6.748	174.4	6.866	237.4	9.346	235	9.252	2.4	.094	13.0	.512	7
					15	Int.	●	MWS1300X15DB	236.4	9.307	239.4	9.425	302.4	11.906	300	11.811	2.4	.094	13.0	.512	7
					20	Int.	★	MWS1300X20DB	301.4	11.866	304.4	11.984	367.4	14.465	365	14.370	2.4	.094	13.0	.512	7
13.096	.5156	33/64		9/16-18	5	Int.	▲	MWS05156LB	110.4	4.346	114.4	4.504	178.4	7.024	176	6.929	2.4	.094	13.891	.547	6
					2	Ext.	▲	MWE1310SA	53.4	2.102	53.4	2.102	104.4	4.110	102	4.016	2.4	.094	13.1	.516	1
					3	Ext.	▲	MWE1310MA	86.4	3.402	86.4	3.402	146.4	5.764	144	5.669	2.4	.094	13.1	.516	1
					3	Int.	▲	MWS1310MB	69.9	2.752	72.4	2.850	136.4	5.370	134	5.276	2.4	.094	14.0	.551	6
13.1	.5157	33/64		9/16-18	5	Int.	▲	MWS1310LB	110.4	4.346	114.4	4.504	178.4	7.024	176	6.929	2.4	.094	14.0	.551	6
					10	Int.	□	MWS1310X10DB	178.4	7.024	181.4	7.142	245.4	9.661	243	9.567	2.4	.094	14.0	.551	7
					15	Int.	□	MWS1310X15DB	245.4	9.661	248.4	9.780	312.4	12.299	310	12.205	2.4	.094	14.0	.551	7
					20	Int.	●	MWS1310X20DB	313.4	12.339	316.4	12.457	380.4	14.976	378	14.882	2.4	.094	14.0	.551	7
					2	Ext.	▲	MWE1320SA	53.4	2.102	53.4	2.102	104.4	4.110	102	4.016	2.4	.094	13.2	.520	1
					3	Ext.	▲	MWE1320MA	86.4	3.402	86.4	3.402	146.4	5.764	144	5.669	2.4	.094	13.2	.520	1
					3	Int.	▲	MWS1320MB	69.9	2.752	72.4	2.850	136.4	5.370	134	5.276	2.4	.094	14.0	.551	6
13.200	.5197				5	Int.	▲	MWS1320LB	110.4	4.346	114.4	4.504	178.4	7.024	176	6.929	2.4	.094	14.0	.551	6
					10	Int.	□	MWS1320X10DB	178.4	7.024	181.4	7.142	245.4	9.661	243	9.567	2.4	.094	14.0	.551	7
					15	Int.	□	MWS1320X15DB	245.4	9.661	248.4	9.780	312.4	12.299	310	12.205	2.4	.094	14.0	.551	7
					20	Int.	□	MWS1320X20DB	313.4	12.339	316.4	12.457	380.4	14.976	378	14.882	2.4	.094	14.0	.551	7
					2	Ext.	▲	MWE1330SA	56.4	2.220	56.4	2.220	109.4	4.307	107	4.213	2.4	.094	13.3	.524	1
					3	Ext.	▲	MWE1330MA	86.4	3.402	86.4	3.402	146.4	5.764	144	5.669	2.4	.094	13.3	.524	1
					3	Int.	▲	MWS1330MB	69.9	2.752	72.4	2.850	136.4	5.370	134	5.276	2.4	.094	14.0	.551	6
13.300	.5236				5	Int.	▲	MWS1330LB	110.4	4.346	114.4	4.504	178.4	7.024	176	6.929	2.4	.094	14.0	.551	6
					10	Int.	●	MWS1330X10DB	178.4	7.024	181.4	7.142	245.4	9.661	243	9.567	2.4	.094	14.0	.551	7
					15	Int.	□	MWS1330X15DB	245.4	9.661	248.4	9.780	312.4	12.299	310	12.205	2.4	.094	14.0	.551	7
					20	Int.	□	MWS1330X20DB	313.4	12.339	316.4	12.457	380.4	14.976	378	14.882	2.4	.094	14.0	.551	7
					2	Ext.	▲	MWE1340SA	56.4	2.220	56.4	2.220	109.4	4.307	107	4.213	2.4	.094	13.4	.528	1
					3	Ext.	▲	MWE1340MA	86.4	3.402	86.4	3.402	146.4	5.764	144	5.669	2.4	.094	13.4	.528	1
					3	Int.	▲	MWS1340MB	69.9	2.752	72.4	2.850	136.4	5.370	134	5.276	2.4	.094	14.0	.551	6
13.400	.5276				5	Int.	▲	MWS1340LB	110.4	4.346	114.4	4.504	178.4	7.024	176	6.929	2.4	.094	14.0	.551	6
					10	Int.	□	MWS1340X10DB	178.4	7.024	181.4	7.142	245.4	9.661	243	9.567	2.4	.094	14.0	.551	7
					15	Int.	□	MWS1340X15DB	245.4	9.661	248.4	9.780	312.4	12.299	310	12.205	2.4	.094	14.0	.551	7
					20	Int.	□	MWS1340X20DB	313.4	12.339	316.4	12.457	380.4	14.976	378	14.882	2.4	.094	14.0	.551	7
13.492	.5312	17/32		5/8-11	5	Int.	▲	MWS05312LB	110.5	4.350	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	13.891	.547	6
					2	Ext.	▲	MWE1350SA	56.5	2.224	56.5	2.224	109.5	4.311	107	4.213	2.5	.098	13.5	.531	1
					3	Ext.	▲	MWE1350MA	86.5	3.406	86.5	3.406	146.5	5.768	144	5.669	2.5	.098	13.5	.531	1
					3	Int.	▲	MWS1350MB	70.0	2.756	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14.0	.551	6
					5	Int.	▲	MWS1350LB	110.5	4.350	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14.0	.551	6
13.500	.5315			5/8-11	8	Int.	▲	MWS1350X8DB	151.5	5.965	156.5	6.161	220.5	8.681	218	8.583	2.5	.098	14.0	.551	6
					10	Int.	●	MWS1350X10DB	178.5	7.028	181.5	7.146	245.5	9.665	243	9.567	2.5	.098	14.0	.551	7
					15	Int.	●	MWS1350X15DB	245.5	9.665	248.5	9.783	312.5	12.303	310	12.205	2.5	.098	14.0	.551	7
					20	Int.	★	MWS1350X20DB	313.5	12.343	316.5	12.461	380.5	14.980	378	14.882	2.5	.098	14.0	.551	7

CUTTING CONDITIONS ➤ L088
HOW TO USE ➤ L094
TECHNICAL DATA ➤ N001

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
13.600	.5354				2	Ext.	▲	MWE1360SA	56.5	2.224	56.5	2.224	109.5	4.311	107	4.213	2.5	.098	13.6	.535	1
					3	Ext.	▲	MWE1360MA	88.5	3.484	88.5	3.484	149.5	5.886	147	5.787	2.5	.098	13.6	.535	1
					3	Int.	▲	MWS1360MB	72.5	2.854	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14.0	.551	6
					5	Int.	▲	MWS1360LB	114.5	4.508	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14.0	.551	6
					10	Int.	□	MWS1360X10DB	184.5	7.264	187.5	7.382	251.5	9.902	249	9.803	2.5	.098	14.0	.551	7
					15	Int.	□	MWS1360X15DB	254.5	10.020	257.5	10.138	321.5	12.657	319	12.559	2.5	.098	14.0	.551	7
					20	Int.	□	MWS1360X20DB	324.5	12.776	327.5	12.894	391.5	15.413	389	15.315	2.5	.098	14.0	.551	7
13.700	.5394				2	Ext.	▲	MWE1370SA	56.5	2.224	56.5	2.224	109.5	4.311	107	4.213	2.5	.098	13.7	.539	1
					3	Ext.	▲	MWE1370MA	88.5	3.484	88.5	3.484	149.5	5.886	147	5.787	2.5	.098	13.7	.539	1
					3	Int.	▲	MWS1370MB	72.5	2.854	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14.0	.551	6
					5	Int.	▲	MWS1370LB	114.5	4.508	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14.0	.551	6
					10	Int.	□	MWS1370X10DB	184.5	7.264	187.5	7.382	251.5	9.902	249	9.803	2.5	.098	14.0	.551	7
					15	Int.	□	MWS1370X15DB	254.5	10.020	257.5	10.138	321.5	12.657	319	12.559	2.5	.098	14.0	.551	7
					20	Int.	●	MWS1370X20DB	324.5	12.776	327.5	12.894	391.5	15.413	389	15.315	2.5	.098	14.0	.551	7
13.800	.5433				2	Ext.	▲	MWE1380SA	56.5	2.224	56.5	2.224	109.5	4.311	107	4.213	2.5	.098	13.8	.543	1
					3	Ext.	▲	MWE1380MA	88.5	3.484	88.5	3.484	149.5	5.886	147	5.787	2.5	.098	13.8	.543	1
					3	Int.	▲	MWS1380MB	72.5	2.854	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14.0	.551	6
					5	Int.	▲	MWS1380LB	114.5	4.508	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14.0	.551	6
					10	Int.	□	MWS1380X10DB	184.5	7.264	187.5	7.382	251.5	9.902	249	9.803	2.5	.098	14.0	.551	7
					15	Int.	□	MWS1380X15DB	254.5	10.020	257.5	10.138	321.5	12.657	319	12.559	2.5	.098	14.0	.551	7
					20	Int.	□	MWS1380X20DB	324.5	12.776	327.5	12.894	391.5	15.413	389	15.315	2.5	.098	14.0	.551	7
13.891	.5469	35/64			5	Int.	▲	MWS05469LB	114.5	4.508	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	13.891	.547	6
13.900	.5472				2	Ext.	▲	MWE1390SA	56.5	2.224	56.5	2.224	109.5	4.311	107	4.213	2.5	.098	13.9	.547	1
					3	Ext.	▲	MWE1390MA	88.5	3.484	88.5	3.484	149.5	5.886	147	5.787	2.5	.098	13.9	.547	1
					3	Int.	▲	MWS1390MB	72.5	2.854	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14.0	.551	6
					5	Int.	▲	MWS1390LB	114.5	4.508	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14.0	.551	6
					10	Int.	□	MWS1390X10DB	184.5	7.264	187.5	7.382	251.5	9.902	249	9.803	2.5	.098	14.0	.551	7
					15	Int.	□	MWS1390X15DB	254.5	10.020	257.5	10.138	321.5	12.657	319	12.559	2.5	.098	14.0	.551	7
					20	Int.	□	MWS1390X20DB	324.5	12.776	327.5	12.894	391.5	15.413	389	15.315	2.5	.098	14.0	.551	7
14.000	.5512			M16x2.0	2	Ext.	▲	MWE1400SA	56.6	2.228	56.6	2.228	109.6	4.315	107	4.213	2.6	.102	14.0	.551	1
					3	Ext.	▲	MWE1400MA	88.6	3.488	88.6	3.488	149.6	5.890	147	5.787	2.6	.102	14.0	.551	1
					3	Int.	▲	MWS1400MB	72.6	2.858	72.6	2.858	136.6	5.378	134	5.276	2.6	.102	14.0	.551	6
					5	Int.	▲	MWS1400LB	114.6	4.512	114.6	4.512	178.6	7.031	176	6.929	2.6	.102	14.0	.551	6
					8	Int.	▲	MWS1400X8DB	156.6	6.165	156.6	6.165	220.6	8.685	218	8.583	2.6	.102	14.0	.551	6
					10	Int.	●	MWS1400X10DB	184.6	7.268	187.6	7.386	251.6	9.906	249	9.803	2.6	.102	14.0	.551	7
					15	Int.	●	MWS1400X15DB	254.6	10.024	257.6	10.142	321.6	12.661	319	12.559	2.6	.102	14.0	.551	7
					20	Int.	●	MWS1400X20DB	324.6	12.780	327.6	12.898	391.6	15.417	389	15.315	2.6	.102	14.0	.551	7
14.100	.5551				2	Ext.	▲	MWE1410SA	58.6	2.307	58.6	2.307	113.6	4.472	111	4.370	2.6	.102	14.1	.555	1
					3	Ext.	▲	MWE1410MA	91.6	3.606	91.6	3.606	153.6	6.047	151	5.945	2.6	.102	14.1	.555	1
					3	Int.	▲	MWS1410MB	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	15.0	.591	6
					5	Int.	▲	MWS1410LB	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	15.0	.591	6
14.200	.5591				2	Ext.	▲	MWE1420SA	58.6	2.307	58.6	2.307	113.6	4.472	111	4.370	2.6	.102	14.2	.559	1
					3	Ext.	▲	MWE1420MA	91.6	3.606	91.6	3.606	153.6	6.047	151	5.945	2.6	.102	14.2	.559	1
					3	Int.	▲	MWS1420MB	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	15.0	.591	6
					5	Int.	▲	MWS1420LB	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	15.0	.591	6
					8	Int.	▲	MWS1420X8DB	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	15.0	.591	6

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ▲ : This item to be discontinued within two years.

□ : Non stock, produced to order only.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
14.288	**.5625**	**9/16**			5	Int.	▲	**MWS05625LB**	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	14.684	.578	6
14.300	**.5630**				3	Ext.	▲	**MWE1430MA**	91.6	3.606	91.6	3.606	153.6	6.047	151	5.945	2.6	.102	14.3	.563	1
					3	Int.	▲	**MWS1430MB**	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	15.0	.591	6
					5	Int.	▲	**MWS1430LB**	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	15.0	.591	6
14.400	**.5669**				3	Ext.	▲	**MWE1440MA**	91.6	3.606	91.6	3.606	153.6	6.047	151	5.945	2.6	.102	14.4	.567	1
					3	Int.	▲	**MWS1440MB**	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	15.0	.591	6
					5	Int.	▲	**MWS1440LB**	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	15.0	.591	6
14.500	**.5709**			**M16x1.5**	2	Ext.	▲	**MWE1450SA**	58.6	2.307	58.6	2.307	113.6	4.472	111	4.370	2.6	.102	14.5	.571	1
					3	Ext.	▲	**MWE1450MA**	91.6	3.606	91.6	3.606	153.6	6.047	151	5.945	2.6	.102	14.5	.571	1
					3	Int.	▲	**MWS1450MB**	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	15.0	.591	6
					5	Int.	▲	**MWS1450LB**	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	15.0	.591	6
					8	Int.	▲	**MWS1450X8DB**	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	15.0	.591	6
14.600	**.5748**				3	Ext.	▲	**MWE1460MA**	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	14.6	.575	1
					3	Int.	▲	**MWS1460MB**	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	15.0	.591	6
					5	Int.	▲	**MWS1460LB**	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	15.0	.591	6
14.684	**.5781**	**37/64**		**5/8-18**	5	Int.	▲	**MWS05781LB**	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	14.684	.578	6
14.700	**.5787**				3	Ext.	▲	**MWE1470MA**	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	14.7	.579	1
					3	Int.	▲	**MWS1470MB**	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	15.0	.591	6
					5	Int.	▲	**MWS1470LB**	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	15.0	.591	6
14.800	**.5827**				3	Ext.	▲	**MWE1480MA**	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	14.8	.583	1
					3	Int.	▲	**MWS1480MB**	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	15.0	.591	6
					5	Int.	▲	**MWS1480LB**	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	15.0	.591	6
14.900	**.5866**				3	Ext.	▲	**MWE1490MA**	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	14.9	.587	1
					3	Int.	▲	**MWS1490MB**	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	15.0	.591	6
					5	Int.	▲	**MWS1490LB**	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	15.0	.591	6
15.000	**.5906**				2	Ext.	▲	**MWE1500SA**	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	15.0	.591	1
					3	Ext.	▲	**MWE1500MA**	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	15.0	.591	1
					3	Int.	▲	**MWS1500MB**	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	15.0	.591	6
					5	Int.	▲	**MWS1500LB**	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	15.0	.591	6
					8	Int.	▲	**MWS1500X8DB**	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	15.0	.591	6
15.080	**.5937**	**19/32**			5	Int.	▲	**MWS05937LB**	126.7	4.988	130.7	5.146	195.7	7.705	193	7.598	2.7	.106	15.875	.625	6
15.100	**.5945**				3	Ext.	▲	**MWE1510MA**	96.8	3.811	96.8	3.811	159.8	6.291	157	6.181	2.8	.110	15.1	.594	1
					3	Int.	▲	**MWS1510MB**	80.3	3.161	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16.0	.630	6
					5	Int.	▲	**MWS1510LB**	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16.0	.630	6
15.200	**.5984**				2	Ext.	▲	**MWE1520SA**	60.8	2.394	60.8	2.394	117.8	4.638	115	4.528	2.8	.110	15.2	.598	1
					3	Ext.	▲	**MWE1520MA**	96.8	3.811	96.8	3.811	159.8	6.291	157	6.181	2.8	.110	15.2	.598	1
					3	Int.	▲	**MWS1520MB**	80.3	3.161	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16.0	.630	6
					5	Int.	▲	**MWS1520LB**	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16.0	.630	6
15.300	**.6024**				3	Ext.	▲	**MWE1530MA**	96.8	3.811	96.8	3.811	159.8	6.291	157	6.181	2.8	.110	15.3	.602	1
					3	Int.	▲	**MWS1530MB**	80.3	3.161	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16.0	.630	6
					5	Int.	▲	**MWS1530LB**	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16.0	.630	6
15.400	**.6063**				3	Ext.	▲	**MWE1540MA**	96.8	3.811	96.8	3.811	159.8	6.291	157	6.181	2.8	.110	15.4	.606	1
					3	Int.	▲	**MWS1540MB**	80.3	3.161	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16.0	.630	6
					5	Int.	▲	**MWS1540LB**	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16.0	.630	6

DRILLING

MWE/MWS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
15.479	.6094	39/64			5	Int.	▲	MWS06094LB	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	15.875	.625	6
15.500	.6102			M18x2.5	2	Ext.	▲	MWE1550SA	60.8	2.394	60.8	2.394	117.8	4.638	115	4.528	2.8	.110	15.5	.610	1
					3	Ext.	▲	MWE1550MA	96.8	3.811	96.8	3.811	159.8	6.291	157	6.181	2.8	.110	15.5	.610	1
					3	Int.	▲	MWS1550MB	80.3	3.161	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16.0	.630	6
					5	Int.	▲	MWS1550LB	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16.0	.630	6
					8	Int.	▲	MWS1550X8DB	173.8	6.843	183.8	7.236	243.8	9.598	241	9.488	2.8	.110	16.0	.630	6
15.600	.6142				3	Ext.	▲	MWE1560MA	98.8	3.890	98.8	3.890	162.8	6.409	160	6.299	2.8	.110	15.6	.614	1
					3	Int.	▲	MWS1560MB	82.8	3.260	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16.0	.630	6
					5	Int.	▲	MWS1560LB	130.8	5.150	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16.0	.630	6
15.700	.6181				3	Ext.	▲	MWE1570MA	98.9	3.894	98.9	3.894	162.9	6.413	160	6.299	2.9	.114	15.7	.618	1
					3	Int.	▲	MWS1570MB	82.9	3.264	82.9	3.264	147.9	5.823	145	5.709	2.9	.114	16.0	.630	6
					5	Int.	▲	MWS1570LB	130.9	5.154	130.9	5.154	195.9	7.713	193	7.598	2.9	.114	16.0	.630	6
15.800	.6220				3	Ext.	▲	MWE1580MA	98.9	3.894	98.9	3.894	162.9	6.413	160	6.299	2.9	.114	15.8	.622	1
					3	Int.	▲	MWS1580MB	82.9	3.264	82.9	3.264	147.9	5.823	145	5.709	2.9	.114	16.0	.630	6
					5	Int.	▲	MWS1580LB	130.9	5.154	130.9	5.154	195.9	7.713	193	7.598	2.9	.114	16.0	.630	6
15.875	.6250	5/8			5	Int.	▲	MWS06250LB	130.9	5.154	130.9	5.154	195.9	7.713	193	7.598	2.9	.114	15.875	.625	6
15.900	.6260				3	Ext.	▲	MWE1590MA	98.9	3.894	98.9	3.894	162.9	6.413	160	6.299	2.9	.114	15.9	.626	1
					3	Int.	▲	MWS1590MB	82.9	3.264	82.9	3.264	147.9	5.823	145	5.709	2.9	.114	16.0	.630	6
					5	Int.	▲	MWS1590LB	130.9	5.154	130.9	5.154	195.9	7.713	193	7.598	2.9	.114	16.0	.630	6
16.000	.6299				2	Ext.	▲	MWE1600SA	60.9	2.398	60.9	2.398	117.9	4.642	115	4.528	2.9	.114	16.0	.630	1
					3	Ext.	▲	MWE1600MA	98.9	3.894	98.9	3.894	162.9	6.413	160	6.299	2.9	.114	16.0	.630	1
					3	Int.	▲	MWS1600MB	82.9	3.264	82.9	3.264	147.9	5.823	145	5.709	2.9	.114	16.0	.630	6
					5	Int.	▲	MWS1600LB	130.9	5.154	130.9	5.154	195.9	7.713	193	7.598	2.9	.114	16.0	.630	6
					8	Int.	▲	MWS1600X8DB	178.9	7.043	183.9	7.240	243.9	9.602	241	9.488	2.9	.114	16.0	.630	6
16.078	.6330				5	Int.	▲	MWS06330LB	134.9	5.311	138.9	5.469	203.9	8.028	201	7.913	2.9	.114	16.67	.656	6
16.200	.6378				2	Ext.	▲	MWE1620SA	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	16.2	.638	1
16.271	.6406	41/64			5	Int.	▲	MWS06406LB	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	16.67	.656	6
16.300	.6417				2	Ext.	▲	MWE1630SA	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	16.3	.642	1
16.500	.6496			M18x1.5	2	Ext.	▲	MWE1650SA	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	16.5	.650	1
					3	Ext.	▲	MWE1650MA	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	16.5	.650	1
					3	Int.	▲	MWS1650MB	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	17.0	.669	6
					5	Int.	▲	MWS1650LB	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	17.0	.669	6
16.670	.6563	21/32		3/4-10	5	Int.	▲	MWS06563LB	139.0	5.472	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	16.67	.656	6
17.000	.6693		Tube Sheet		2	Ext.	▲	MWE1700SA	63.1	2.484	63.1	2.484	122.1	4.807	119	4.685	3.1	.122	17.0	.669	1
					3	Ext.	▲	MWE1700MA	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	17.0	.669	1
					3	Int.	▲	MWS1700MB	88.1	3.469	88.1	3.469	153.1	6.028	150	5.906	3.1	.122	17.0	.669	6
					5	Int.	▲	MWS1700LB	139.1	5.476	139.1	5.476	204.1	8.035	201	7.913	3.1	.122	17.0	.669	6
17.064	.6718	43/64			5	Int.	▲	MWS06718LB	143.1	5.634	147.1	5.791	212.1	8.350	209	8.228	3.1	.122	17.859	.703	6
17.100	.6732				3	Int.	▲	MWS1710MB	90.6	3.567	93.1	3.665	158.1	6.224	155	6.102	3.1	.122	18.0	.709	6
17.463	.6875	11/16		3/4-16	5	Int.	▲	MWS06875LB	143.2	5.638	147.2	5.795	212.2	8.354	209	8.228	3.2	.126	17.859	.703	6
17.500	.6890			M20x2.5	2	Ext.	▲	MWE1750SA	65.2	2.567	65.2	2.567	126.2	4.969	123	4.843	3.2	.126	17.5	.689	1
					3	Ext.	▲	MWE1750MA	105.2	4.142	105.2	4.142	170.2	6.701	167	6.575	3.2	.126	17.5	.689	1
					3	Int.	▲	MWS1750MB	90.7	3.571	93.2	3.669	158.2	6.228	155	6.102	3.2	.126	18.0	.709	6
					5	Int.	▲	MWS1750LB	143.2	5.638	147.2	5.795	212.2	8.354	209	8.228	3.2	.126	18.0	.709	6
17.800	.7008				2	Ext.	▲	MWE1780SA	65.2	2.567	65.2	2.567	126.2	4.969	123	4.843	3.2	.126	17.8	.701	1
17.859	.7031	45/64			5	Int.	▲	MWS07031LB	147.3	5.799	147.3	5.799	212.3	8.358	209	8.228	3.3	.130	17.859	.703	6

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. ★ : Inventory maintained in Japan.

▲ : This item to be discontinued within two years.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		LCF		LH		OAL		LF		PL		DCON		
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
18.000	.7087				2	Ext.	▲	MWE1800SA	65.3	2.571	65.3	2.571	126.3	4.972	123	4.843	3.3	.130	18.0	.709	1
					3	Ext.	▲	MWE1800MA	105.3	4.146	105.3	4.146	170.3	6.705	167	6.575	3.3	.130	18.0	.709	1
					3	Int.	▲	MWS1800MB	93.3	3.673	93.3	3.673	158.3	6.232	155	6.102	3.3	.130	18.0	.709	6
					5	Int.	▲	MWS1800LB	147.3	5.799	147.3	5.799	212.3	8.358	209	8.228	3.3	.130	18.0	.709	6
18.258	.7188	23/32			5	Int.	▲	MWS07188LB	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	18.654	.734	6
18.500	.7283			M20x1.5	2	Ext.	▲	MWE1850SA	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	18.5	.728	1
					3	Ext.	▲	MWE1850MA	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	18.5	.728	1
					3	Int.	▲	MWS1850MB	95.9	3.776	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	19.0	.748	6
					5	Int.	▲	MWS1850LB	151.4	5.961	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	19.0	.748	6
18.654	.7344	47/64			5	Int.	▲	MWS07344LB	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	18.654	.734	6
19.000	.7480				2	Ext.	▲	MWE1900SA	67.5	2.657	67.5	2.657	130.5	5.138	127	5.000	3.5	.138	19.0	.748	1
					3	Ext.	▲	MWE1900MA	117.5	4.626	117.5	4.626	182.5	7.185	179	7.047	3.5	.138	19.0	.748	1
					3	Int.	▲	MWS1900MB	98.5	3.878	98.5	3.878	163.5	6.437	160	6.299	3.5	.138	19.0	.748	6
					5	Int.	▲	MWS1900LB	155.5	6.122	155.5	6.122	220.5	8.681	217	8.543	3.5	.138	19.0	.748	6
19.050	.7500	3/4			5	Int.	▲	MWS07500LB	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	19.842	.781	6
19.253	.7580		Tube Sheet		5	Int.	▲	MWS07580LB	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	19.842	.781	6
19.446	.7656	49/64		7/8-9	5	Int.	▲	MWS07656LB	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	19.842	.781	6
19.500	.7677			M22x2.5	2	Ext.	▲	MWE1950SA	69.6	2.740	69.6	2.740	134.6	5.299	131	5.157	3.6	.142	19.5	.768	1
					3	Ext.	▲	MWE1950MA	117.6	4.630	117.6	4.630	182.6	7.189	179	7.047	3.6	.142	19.5	.768	1
					3	Int.	▲	MWS1950MB	101.1	3.980	103.6	4.079	168.6	6.638	165	6.496	3.6	.142	20.0	.787	6
					5	Int.	▲	MWS1950LB	159.6	6.283	163.6	6.441	228.6	9.000	225	8.858	3.6	.142	20.0	.787	6
19.842	.7812	25/32			5	Int.	▲	MWS07812LB	163.6	6.441	163.6	6.441	228.6	9.000	225	8.858	3.6	.142	19.842	.781	6
20.000	.7874				2	Ext.	▲	MWE2000SA	69.6	2.740	69.6	2.740	134.6	5.299	131	5.157	3.6	.142	20.0	.787	1
					3	Ext.	▲	MWE2000MA	117.6	4.630	117.6	4.630	182.6	7.189	179	7.047	3.6	.142	20.0	.787	1
					3	Int.	▲	MWS2000MB	103.6	4.079	103.6	4.079	168.6	6.638	165	6.496	3.6	.142	20.0	.787	6
					5	Int.	▲	MWS2000LB	163.6	6.441	163.6	6.441	228.6	9.000	225	8.858	3.6	.142	20.0	.787	6
20.500	.8071				3	Int.	★	MWS2050MB	106.7	4.201	108.7	4.280	179.7	7.075	176	6.929	3.7	.146	21.0	.827	6
					5	Int.	★	MWS2050LB	169.7	6.681	171.7	6.760	242.7	9.555	239	9.409	3.7	.146	21.0	.827	6
21.000	.8268				3	Int.	★	MWS2100MB	108.8	4.283	108.8	4.283	179.8	7.079	176	6.929	3.8	.150	21.0	.827	6
					5	Int.	★	MWS2100LB	171.8	6.764	171.8	6.764	242.8	9.559	239	9.409	3.8	.150	21.0	.827	6
21.500	.8465				3	Int.	●	MWS2150MB	111.9	4.406	113.9	4.484	185.9	7.319	182	7.165	3.9	.154	22.0	.866	6
					5	Int.	★	MWS2150LB	177.9	7.004	179.9	7.083	251.9	9.917	248	9.764	3.9	.154	22.0	.866	6
22.000	.8661				3	Int.	★	MWS2200MB	114.0	4.488	114.0	4.488	186.0	7.323	182	7.165	4.0	.157	22.0	.866	6
					5	Int.	★	MWS2200LB	180.0	7.087	180.0	7.087	252.0	9.921	248	9.764	4.0	.157	22.0	.866	6
22.500	.8858				3	Int.	★	MWS2250MB	119.1	4.689	119.1	4.689	192.1	7.563	188	7.402	4.1	.161	23.0	.906	6
					5	Int.	★	MWS2250LB	186.1	7.327	188.1	7.406	261.1	10.280	257	10.118	4.1	.161	23.0	.906	6
23.000	.9055				3	Int.	★	MWS2300MB	119.2	4.693	119.2	4.693	192.2	7.567	188	7.402	4.2	.165	23.0	.906	6
					5	Int.	●	MWS2300LB	188.2	7.409	188.2	7.409	261.2	10.283	257	10.118	4.2	.165	23.0	.906	6
23.500	.9252				3	Int.	★	MWS2350MB	122.3	4.815	124.3	4.894	198.3	7.807	194	7.638	4.3	.169	24.0	.945	6
					5	Int.	★	MWS2350LB	194.3	7.650	196.3	7.728	270.3	10.642	266	10.472	4.3	.169	24.0	.945	6
24.000	.9449				3	Int.	★	MWS2400MB	124.4	4.898	124.4	4.898	198.4	7.811	194	7.638	4.4	.173	24.0	.945	6
					5	Int.	★	MWS2400LB	196.4	7.732	196.4	7.732	270.4	10.646	266	10.472	4.4	.173	24.0	.945	6
24.500	.9646				3	Int.	★	MWS2450MB	127.5	5.020	129.5	5.098	204.5	8.051	200	7.874	4.5	.177	25.0	.984	6
					5	Int.	★	MWS2450LB	202.5	7.972	204.5	8.051	274.5	10.807	270	10.630	4.5	.177	25.0	.984	6
25.000	.9843				3	Int.	★	MWS2500MB	129.6	5.102	129.6	5.102	204.6	8.055	200	7.874	4.6	.181	25.0	.984	6
					5	Int.	★	MWS2500LB	204.6	8.055	204.6	8.055	274.6	10.811	270	10.630	4.6	.181	25.0	.984	6

DRILLING

MWE/MWS

RECOMMENDED CUTTING CONDITIONS

MWE

Work Material		Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.1181	3.0	215 (165—230)	.0039 (.0024—.0051)	195 (150—215)	.0039 (.0024—.0051)
.1575	4.0	230 (180—245)	.0047 (.0031—.0063)	215 (165—230)	.0047 (.0031—.0063)
.1969	5.0	230 (180—245)	.0059 (.0039—.0079)	215 (165—230)	.0059 (.0039—.0079)
.2480	6.3	260 (195—280)	.0079 (.0051—.0102)	245 (195—260)	.0079 (.0051—.0102)
.3150	8.0	280 (215—295)	.0091 (.0071—.0110)	260 (195—280)	.0091 (.0071—.0110)
.3937	10.0	295 (230—310)	.0106 (.0087—.0126)	280 (215—295)	.0106 (.0087—.0126)
.4724	12.0	310 (245—330)	.0122 (.0110—.0134)	295 (230—310)	.0122 (.0110—.0134)
.6299	16.0	330 (260—360)	.0130 (.0110—.0150)	295 (230—310)	.0130 (.0110—.0150)
.7874	20.0	330 (260—360)	.0138 (.0118—.0157)	295 (230—310)	.0138 (.0118—.0157)

Work Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.1181	3.0	180 (130—195)	.0035 (.0024—.0047)	65 (50—80)	.0028 (.0020—.0031)
.1575	4.0	195 (150—215)	.0043 (.0028—.0055)	65 (50—80)	.0031 (.0024—.0039)
.1969	5.0	195 (150—215)	.0055 (.0035—.0071)	65 (50—80)	.0039 (.0028—.0051)
.2480	6.3	230 (180—245)	.0071 (.0043—.0094)	80 (65—100)	.0051 (.0035—.0067)
.3150	8.0	245 (195—260)	.0083 (.0063—.0098)	80 (65—100)	.0055 (.0039—.0071)
.3937	10.0	260 (195—280)	.0091 (.0075—.0106)	80 (65—100)	.0063 (.0047—.0075)
.4724	12.0	280 (215—295)	.0102 (.0091—.0114)	80 (65—100)	.0071 (.0059—.0079)
.6299	16.0	280 (215—295)	.0114 (.0094—.0130)	80 (65—100)	.0075 (.0059—.0091)
.7874	20.0	280 (215—295)	.0118 (.0102—.0134)	80 (65—100)	.0079 (.0059—.0094)

(Note) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

RECOMMENDED CUTTING CONDITIONS

MWE

Work Material		Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-40-8 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.1181	3.0	230 (180—245)	.0039 (.0024—.0051)	215 (165—230)	.0039 (.0024—.0051)
.1575	4.0	230 (180—245)	.0047 (.0031—.0063)	215 (165—230)	.0047 (.0031—.0063)
.1969	5.0	230 (180—245)	.0059 (.0039—.0079)	215 (165—230)	.0059 (.0039—.0079)
.2480	6.3	245 (195—260)	.0079 (.0051—.0102)	230 (180—245)	.0079 (.0051—.0102)
.3150	8.0	245 (195—260)	.0098 (.0071—.0122)	230 (180—245)	.0091 (.0071—.0110)
.3937	10.0	245 (195—260)	.0114 (.0087—.0138)	230 (180—245)	.0106 (.0087—.0126)
.4724	12.0	260 (195—280)	.0130 (.0110—.0146)	245 (195—260)	.0122 (.0110—.0134)
.6299	16.0	260 (195—280)	.0138 (.0110—.0165)	245 (195—260)	.0130 (.0110—.0150)
.7874	20.0	280 (215—295)	.0146 (.0118—.0173)	260 (195—280)	.0138 (.0118—.0157)

Work Material		Aluminium Alloy (Si<5%) ASTM A6061, A7075 etc.		Heat Resistant Alloy Inconel718 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.1181	3.0	260 (195—280)	.0039 (.0024—.0051)	65 (50—80)	.0028 (.0020—.0035)
.1575	4.0	260 (195—280)	.0047 (.0031—.0063)	65 (50—80)	.0035 (.0024—.0043)
.1969	5.0	260 (195—280)	.0059 (.0039—.0079)	65 (50—80)	.0043 (.0031—.0055)
.2480	6.3	295 (230—310)	.0079 (.0051—.0102)	80 (65—100)	.0055 (.0035—.0075)
.3150	8.0	295 (230—310)	.0091 (.0071—.0110)	80 (65—100)	.0055 (.0043—.0067)
.3937	10.0	295 (230—310)	.0106 (.0087—.0126)	80 (65—100)	.0063 (.0047—.0075)
.4724	12.0	330 (260—360)	.0122 (.0110—.0134)	80 (65—100)	.0063 (.0051—.0071)
.6299	16.0	330 (260—360)	.0130 (.0110—.0150)	80 (65—100)	.0071 (.0055—.0083)
.7874	20.0	360 (280—395)	.0138 (.0118—.0157)	100 (65—115)	.0075 (.0059—.0087)

Work Material		Hardened Steel (40—55HRC) AISI H13, L6 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm		
.1181	3.0	65 (50—80)	.0028 (.0020—.0035)
.1575	4.0	65 (50—80)	.0035 (.0024—.0043)
.1969	5.0	65 (50—80)	.0043 (.0031—.0055)
.2480	6.3	80 (65—100)	.0055 (.0035—.0075)
.3150	8.0	80 (65—100)	.0055 (.0043—.0067)
.3937	10.0	80 (65—100)	.0063 (.0047—.0075)
.4724	12.0	80 (65—100)	.0063 (.0051—.0071)
.6299	16.0	80 (65—100)	.0071 (.0055—.0083)
.7874	20.0	100 (65—115)	.0075 (.0059—.0087)

(Note) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MWE/MWS

RECOMMENDED CUTTING CONDITIONS

MWS SB/MB/LB/XB/DB Type (l/d<10)

Work Material		Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.	
Drill Dia. **DC** inch	mm	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
.0197	0.50	130 (100—150)	.0004 (.0002—.0006)	130 (100—150)	.0004 (.0002—.0006)
.0248	0.63	130 (100—150)	.0006 (.0003—.0008)	130 (100—150)	.0006 (.0003—.0008)
.0315	0.80	150 (115—165)	.0011 (.0006—.0016)	150 (115—165)	.0011 (.0006—.0016)
.0394	1.00	165 (130—180)	.0014 (.0008—.0020)	165 (130—180)	.0014 (.0008—.0020)
.0472	1.20	165 (130—180)	.0018 (.0012—.0024)	165 (130—180)	.0018 (.0012—.0024)
.0630	1.60	165 (130—180)	.0022 (.0014—.0031)	165 (130—180)	.0022 (.0014—.0031)
.0787	2.00	165 (130—180)	.0028 (.0016—.0039)	165 (130—180)	.0028 (.0016—.0039)
.0984	2.50	195 (150—230)	.0033 (.0020—.0049)	195 (150—215)	.0033 (.0020—.0049)
.1260	3.20	295 (230—330)	.0039 (.0024—.0051)	260 (195—295)	.0039 (.0024—.0051)
.1575	4.00	330 (260—360)	.0047 (.0031—.0063)	295 (230—330)	.0047 (.0031—.0063)
.1969	5.00	330 (260—360)	.0059 (.0039—.0079)	295 (230—330)	.0059 (.0039—.0079)
.2480	6.30	360 (280—395)	.0079 (.0051—.0102)	330 (260—360)	.0079 (.0051—.0102)
.3150	8.00	395 (310—425)	.0091 (.0071—.0110)	360 (280—395)	.0091 (.0071—.0110)
.3937	10.00	425 (330—460)	.0106 (.0087—.0126)	395 (310—425)	.0106 (.0087—.0126)
.4724	12.00	460 (360—490)	.0118 (.0102—.0134)	425 (330—460)	.0118 (.0102—.0134)
.6299	16.00	525 (410—560)	.0130 (.0106—.0150)	460 (360—490)	.0130 (.0106—.0150)
.7874	20.00	525 (410—560)	.0138 (.0118—.0157)	460 (360—490)	.0138 (.0118—.0157)
.9843	25.00	525 (410—560)	.0138 (.0118—.0157)	460 (360—490)	.0138 (.0118—.0157)

Work Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.	
Drill Dia. **DC** inch	mm	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
.0197	0.50	100 (65—115)	.0004 (.0002—.0006)	65 (50—80)	.0003 (.0002—.0004)
.0248	0.63	100 (65—115)	.0006 (.0003—.0008)	65 (50—80)	.0004 (.0003—.0005)
.0315	0.80	115 (80—130)	.0011 (.0006—.0016)	80 (65—100)	.0008 (.0006—.0010)
.0394	1.00	130 (100—150)	.0014 (.0008—.0020)	100 (65—115)	.0012 (.0008—.0017)
.0472	1.20	130 (100—150)	.0018 (.0012—.0024)	100 (65—115)	.0016 (.0012—.0021)
.0630	1.60	130 (100—150)	.0022 (.0014—.0031)	100 (65—115)	.0020 (.0014—.0028)
.0787	2.00	130 (100—150)	.0028 (.0016—.0039)	100 (65—115)	.0024 (.0016—.0031)
.0984	2.50	165 (130—180)	.0033 (.0020—.0049)	130 (100—150)	.0030 (.0020—.0039)
.1260	3.20	230 (180—260)	.0039 (.0024—.0051)	130 (100—150)	.0031 (.0024—.0039)
.1575	4.00	260 (195—295)	.0043 (.0028—.0055)	130 (100—150)	.0035 (.0024—.0043)
.1969	5.00	260 (195—295)	.0055 (.0035—.0071)	130 (100—150)	.0043 (.0031—.0055)
.2480	6.30	295 (230—330)	.0071 (.0043—.0094)	165 (130—180)	.0055 (.0035—.0071)
.3150	8.00	330 (260—360)	.0083 (.0063—.0098)	165 (130—180)	.0059 (.0039—.0075)
.3937	10.00	360 (280—395)	.0091 (.0075—.0106)	165 (130—180)	.0063 (.0047—.0079)
.4724	12.00	395 (310—425)	.0102 (.0087—.0114)	195 (150—230)	.0071 (.0059—.0083)
.6299	16.00	425 (330—460)	.0110 (.0091—.0130)	195 (150—230)	.0075 (.0055—.0094)
.7874	20.00	425 (330—460)	.0118 (.0102—.0134)	195 (150—230)	.0083 (.0059—.0102)
.9843	25.00	425 (330—460)	.0126 (.0110—.0138)	195 (150—230)	.0083 (.0067—.0098)

(Note) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

RECOMMENDED CUTTING CONDITIONS

MWS SB/MB/LB/XB/DB Type (l/d<10)

Work Material		Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-40-8 etc.	
Drill Dia. **DC** inch	mm	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
.0197	0.50	130 (100—150)	.0004 (.0002—.0006)	100 (65—115)	.0004 (.0002—.0006)
.0248	0.63	130 (100—150)	.0006 (.0003—.0008)	100 (65—115)	.0006 (.0003—.0008)
.0315	0.80	150 (115—165)	.0011 (.0006—.0016)	115 (80—130)	.0011 (.0006—.0016)
.0394	1.00	165 (130—180)	.0014 (.0008—.0020)	130 (100—150)	.0014 (.0008—.0020)
.0472	1.20	165 (130—180)	.0018 (.0012—.0024)	130 (100—150)	.0018 (.0012—.0024)
.0630	1.60	165 (130—180)	.0022 (.0014—.0031)	130 (100—150)	.0022 (.0014—.0031)
.0787	2.00	165 (130—180)	.0028 (.0016—.0039)	130 (100—150)	.0028 (.0016—.0039)
.0984	2.50	195 (150—215)	.0033 (.0020—.0049)	165 (130—180)	.0033 (.0020—.0049)
.1260	3.20	295 (230—310)	.0039 (.0024—.0051)	215 (165—230)	.0039 (.0024—.0051)
.1575	4.00	330 (260—360)	.0047 (.0031—.0063)	215 (165—230)	.0047 (.0031—.0063)
.1969	5.00	330 (260—360)	.0059 (.0039—.0079)	215 (165—230)	.0059 (.0039—.0079)
.2480	6.30	360 (280—395)	.0079 (.0051—.0102)	230 (180—245)	.0079 (.0051—.0102)
.3150	8.00	395 (310—425)	.0098 (.0071—.0122)	230 (180—245)	.0091 (.0071—.0110)
.3937	10.00	425 (330—460)	.0114 (.0087—.0138)	230 (180—245)	.0106 (.0087—.0126)
.4724	12.00	460 (360—490)	.0126 (.0102—.0146)	295 (230—310)	.0118 (.0102—.0134)
.6299	16.00	525 (410—575)	.0138 (.0110—.0165)	295 (230—310)	.0130 (.0110—.0150)
.7874	20.00	525 (410—575)	.0146 (.0118—.0173)	330 (260—360)	.0138 (.0118—.0157)
.9843	25.00	525 (410—575)	.0146 (.0118—.0173)	330 (260—360)	.0138 (.0118—.0157)

Work Material		Aluminium Alloy (Si<5%) ASTM A6061, A7075 etc.		Heat Resistant Alloy Inconel718 etc.	
Drill Dia. **DC** inch	mm	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
.0197	0.50	130 (100—150)	.0006 (.0003—.0008)	35 (15—50)	.0002 (.0002—.0003)
.0248	0.63	130 (100—150)	.0008 (.0005—.0012)	35 (15—50)	.0003 (.0003—.0004)
.0315	0.80	150 (115—165)	.0014 (.0009—.0020)	35 (15—50)	.0006 (.0005—.0008)
.0394	1.00	195 (150—215)	.0020 (.0012—.0030)	35 (15—50)	.0008 (.0006—.0011)
.0472	1.20	230 (180—245)	.0026 (.0018—.0035)	35 (15—50)	.0010 (.0009—.0013)
.0630	1.60	260 (195—280)	.0033 (.0021—.0047)	35 (15—50)	.0012 (.0010—.0016)
.0787	2.00	295 (230—310)	.0041 (.0024—.0059)	50 (35—65)	.0016 (.0013—.0020)
.0984	2.50	330 (260—360)	.0053 (.0030—.0079)	50 (35—65)	.0020 (.0016—.0024)
.1260	3.20	395 (310—425)	.0091 (.0039—.0138)	65 (50—80)	.0028 (.0020—.0035)
.1575	4.00	395 (310—425)	.0094 (.0047—.0138)	65 (50—80)	.0035 (.0024—.0043)
.1969	5.00	395 (310—425)	.0098 (.0059—.0138)	65 (50—80)	.0043 (.0031—.0055)
.2480	6.30	490 (395—540)	.0138 (.0079—.0197)	80 (65—100)	.0051 (.0035—.0063)
.3150	8.00	490 (395—540)	.0138 (.0079—.0197)	80 (65—100)	.0055 (.0043—.0067)
.3937	10.00	490 (395—540)	.0197 (.0079—.0315)	80 (65—100)	.0059 (.0047—.0067)
.4724	12.00	525 (410—575)	.0197 (.0079—.0315)	80 (65—100)	.0063 (.0051—.0071)
.6299	16.00	525 (410—575)	.0236 (.0079—.0394)	80 (65—100)	.0071 (.0055—.0083)
.7874	20.00	560 (445—605)	.0236 (.0079—.0394)	100 (65—115)	.0075 (.0059—.0087)
.9843	25.00	560 (445—605)	.0236 (.0079—.0394)	100 (65—115)	.0075 (.0059—.0087)

(Note) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MWE/MWS

RECOMMENDED CUTTING CONDITIONS

MWS DB Type (l/d≥10)

Work Material		Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.0394	1.0	165 (130—180)	.0008 (.0004—.0012)	130 (100—130)	.0008 (.0004—.0012)
.0472	1.2	165 (130—180)	.0010 (.0006—.0015)	130 (100—130)	.0010 (.0006—.0015)
.0630	1.6	165 (130—180)	.0022 (.0013—.0031)	130 (100—130)	.0022 (.0013—.0031)
.0787	2.0	195 (150—215)	.0028 (.0016—.0039)	165 (130—180)	.0028 (.0016—.0039)
.0984	2.5	195 (150—215)	.0035 (.0025—.0049)	165 (130—180)	.0035 (.0022—.0049)
.1260	3.2	295 (230—310)	.0039 (.0024—.0051)	260 (195—280)	.0039 (.0024—.0051)
.1575	4.0	295 (230—310)	.0047 (.0031—.0063)	260 (195—280)	.0047 (.0031—.0063)
.1969	5.0	295 (230—310)	.0059 (.0039—.0079)	260 (195—280)	.0059 (.0039—.0079)
.2480	6.3	360 (280—395)	.0079 (.0051—.0102)	295 (230—310)	.0079 (.0051—.0102)
.3150	8.0	360 (280—395)	.0091 (.0071—.0110)	295 (230—310)	.0091 (.0071—.0110)
.3937	10.0	360 (280—395)	.0102 (.0079—.0126)	295 (230—310)	.0102 (.0079—.0126)
.4724	12.0	425 (330—460)	.0118 (.0098—.0134)	360 (280—395)	.0118 (.0098—.0134)
.6299	16.0	425 (330—460)	.0122 (.0094—.0150)	360 (280—395)	.0122 (.0094—.0150)

Work Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.0394	1.0	100 (65—100)	.0006 (.0004—.0011)	100 (65—115)	.0006 (.0004—.0011)
.0472	1.2	100 (65—100)	.0008 (.0005—.0014)	100 (65—115)	.0008 (.0005—.0014)
.0630	1.6	100 (65—100)	.0020 (.0011—.0030)	100 (65—115)	.0020 (.0011—.0030)
.0787	2.0	165 (130—180)	.0026 (.0013—.0037)	100 (65—115)	.0026 (.0013—.0037)
.0984	2.5	165 (130—180)	.0031 (.0018—.0047)	130 (100—150)	.0031 (.0018—.0047)
.1260	3.2	230 (180—245)	.0035 (.0020—.0047)	130 (100—150)	.0028 (.0020—.0035)
.1575	4.0	230 (180—245)	.0043 (.0028—.0059)	130 (100—150)	.0031 (.0024—.0039)
.1969	5.0	230 (180—245)	.0055 (.0035—.0075)	130 (100—150)	.0039 (.0028—.0047)
.2480	6.3	260 (195—280)	.0071 (.0043—.0098)	165 (130—180)	.0047 (.0031—.0063)
.3150	8.0	260 (195—280)	.0083 (.0059—.0102)	165 (130—180)	.0055 (.0039—.0067)
.3937	10.0	260 (195—280)	.0091 (.0059—.0118)	165 (130—180)	.0059 (.0047—.0071)
.4724	12.0	295 (230—310)	.0098 (.0075—.0122)	195 (150—230)	.0067 (.0055—.0075)
.6299	16.0	295 (230—310)	.0110 (.0075—.0142)	195 (150—230)	.0071 (.0051—.0087)

(Note) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

RECOMMENDED CUTTING CONDITIONS

MWS DB Type (l/d≥10)

Work Material		Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-40-8 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.0394	1.0	130 (100—130)	.0008 (.0004—.0012)	100 (65—100)	.0006 (.0004—.0011)
.0472	1.2	130 (100—130)	.0010 (.0006—.0015)	100 (65—100)	.0008 (.0005—.0014)
.0630	1.6	130 (100—130)	.0022 (.0013—.0031)	100 (65—100)	.0020 (.0011—.0030)
.0787	2.0	165 (130—180)	.0028 (.0016—.0039)	165 (130—180)	.0026 (.0013—.0037)
.0984	2.5	165 (130—180)	.0035 (.0022—.0049)	165 (130—180)	.0031 (.0018—.0047)
.1260	3.2	295 (230—310)	.0039 (.0024—.0051)	165 (130—180)	.0035 (.0020—.0047)
.1575	4.0	295 (230—310)	.0047 (.0031—.0063)	165 (130—180)	.0043 (.0028—.0059)
.1969	5.0	295 (230—310)	.0059 (.0039—.0079)	165 (130—180)	.0055 (.0035—.0075)
.2480	6.3	360 (280—395)	.0079 (.0051—.0102)	195 (150—215)	.0071 (.0043—.0098)
.3150	8.0	360 (280—395)	.0091 (.0071—.0110)	195 (150—215)	.0083 (.0059—.0102)
.3937	10.0	360 (280—395)	.0102 (.0079—.0126)	195 (150—215)	.0091 (.0059—.0118)
.4724	12.0	425 (330—460)	.0118 (.0098—.0134)	260 (195—280)	.0098 (.0075—.0122)
.6299	16.0	425 (330—460)	.0122 (.0094—.0150)	260 (195—280)	.0110 (.0075—.0142)

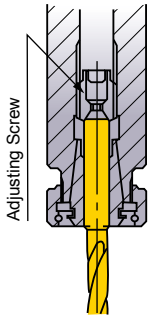
Work Material		Aluminium Alloy (Si<5%) AISI A6061, A7075 etc.		Heat Resistant Alloy Inconel718 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.0394	1.0	165 (130—180)	.0020 (.0012—.0030)	35 (15—50)	.0008 (.0006—.0011)
.0472	1.2	195 (150—215)	.0026 (.0018—.0035)	35 (15—50)	.0010 (.0009—.0013)
.0630	1.6	230 (180—245)	.0033 (.0021—.0047)	35 (15—50)	.0012 (.0010—.0016)
.0787	2.0	260 (195—280)	.0041 (.0024—.0059)	50 (35—65)	.0016 (.0013—.0020)
.0984	2.5	295 (230—310)	.0053 (.0030—.0079)	50 (35—65)	.0020 (.0016—.0024)
.1260	3.2	330 (260—360)	.0091 (.0039—.0138)	65 (50—80)	.0028 (.0020—.0035)
.1575	4.0	330 (260—360)	.0094 (.0047—.0138)	65 (50—80)	.0035 (.0024—.0043)
.1969	5.0	330 (260—360)	.0098 (.0059—.0138)	65 (50—80)	.0043 (.0031—.0055)
.2480	6.3	425 (330—460)	.0138 (.0079—.0197)	65 (50—80)	.0051 (.0035—.0063)
.3150	8.0	425 (330—460)	.0138 (.0079—.0197)	65 (50—80)	.0055 (.0043—.0063)
.3937	10.0	425 (330—460)	.0197 (.0079—.0315)	65 (50—80)	.0059 (.0047—.0067)
.4724	12.0	460 (360—490)	.0197 (.0079—.0315)	65 (50—80)	.0063 (.0051—.0071)
.6299	16.0	460 (360—490)	.0197 (.0079—.0315)	65 (50—80)	.0067 (.0055—.0075)

(Note) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MWE/MWS

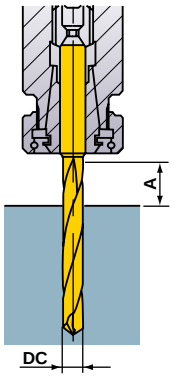
OPERATIONAL GUIDANCE FOR THE MWS DRILLS (Φ.0200"-Φ.1200" & Φ0.50-Φ2.95mm)

Drill Holding



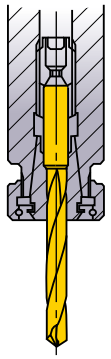
Thrust bearing type collet chuck holds the drill securely.

Drill Length



A ≥ DC x 2

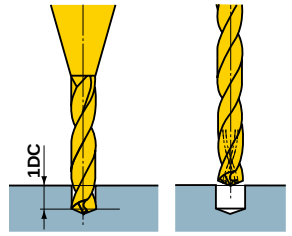
Drill Installation



NG

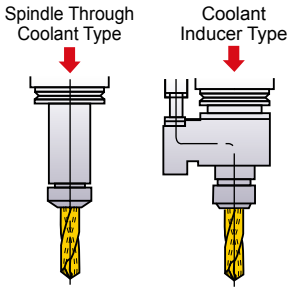
Do not clamp on the flutes.

Drill Installation



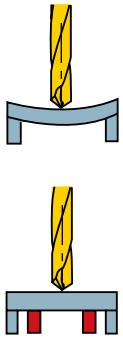
①A pilot hole must proceed application of XB or DB drill.
②Use SB drill for pilot hole.
③Depending on cutting conditions peck feeding may be necessary.

Through Coolant Type



Recommended coolant pressure:
≥ 435 PSI (3MPa)
At least 220 PSI (1.5MPa) is required.

Thin Workpiece



If Bending Occurs

NG

Support the Workpiece

Good

Coolant Handling

1) Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure.

2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

CAUTIONS FOR USE

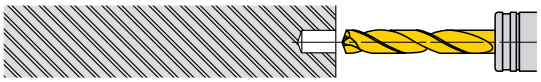
- Please use a fine mesh filter (mesh≤3 micron) for coolant to prevent jamming in the oil hole.
- For deep drilling with the long type drill, machining a pilot hole is recommended.
  (Otherwise, centrifugal forces may cause drill breakage.)

OPERATIONAL GUIDANCE FOR THE MWS...DB DRILL (Φ.125"-Φ.500" & Φ3.0-Φ14.0mm) (L/D≥10)

FLAT FACE DRILLING

●Drilling a blind hole

1. Drilling a pilot hole



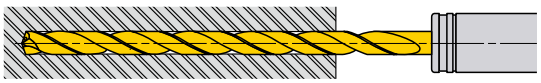
①Use a drill with the same or larger point angle than the MWS...DB type. Mitsubishi type MZE, MZS, MWE or MWS drill is recommended.
②Use a drill with the same diameter as the deep hole drill.
③Drill depth : Approx 1DC or deeper.
④Ensure a high precision hole is drilled for the pilot.

2. Initial cutting with the long type drill



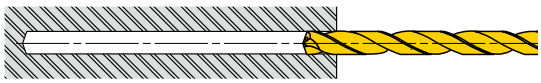
①Penetrate the pilot hole at a low revolution. (Cutting speed 65-100 SFM, feed rate .008-.012 IPR)
②Stop the long type drill .039-.118 inch short of the pilot hole bottom.

3. Drill the deep hole



①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

4. Drill retraction

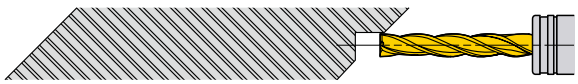


①After drilling, lower the cutting revolution about .039-.079 inch short of the hole end. (Cutting speed of around 65-100 SFM)
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 inch/min.
③Finally clear the hole at a cutting speed of 65-100 SFM and feed rate of .008-.012 IPR.

IRREGULAR FACE DRILLING

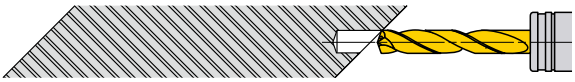
●Drilling and breaking through on irregular faces or angles

1. Spot facing



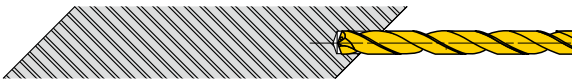
①Machine a flat on the irregular face by using an end mill or drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



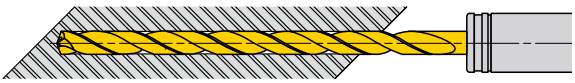
①Use a drill with the same or larger point angle than the MWS...DB type. Mitsubishi type MZE, MZS, MWE or MWS drill is recommended.
②Use a drill with the same diameter as the deep hole drill.
③Drill depth : Approx 1DC or deeper.
④Ensure a high precision hole is drilled for the pilot.

3. Initial cutting with the long type drill



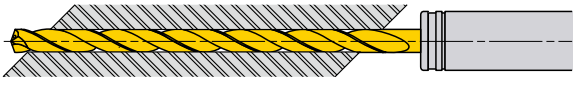
①Penetrate the pilot hole at a low revolution. (Cutting speed 65-100 SFM, feed rate .008-.012 IPR)
②Stop the long type drill .039-.118 inch short of the pilot hole bottom.

4. Drill the deep hole



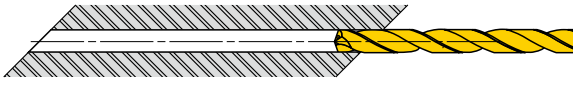
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

5. Breaking through



①When breaking through, the cutting edge can be damaged.
②A feed rate of .002-.004 IPR is recommended.

6. Drill retraction



①Finally clear the hole at a cutting speed of 65-100 SFM.
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 inch/min.

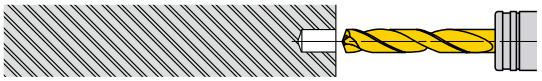
MWE/MWS

OPERATIONAL GUIDANCE FOR THE MICRO-MWS DRILL (Φ.0200"-Φ.1200" & Φ0.50-Φ2.95mm) (L/D≥10)

FLAT FACE DRILLING

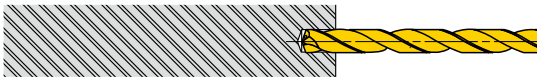
●Drilling a blind hole

1. Drilling a pilot hole



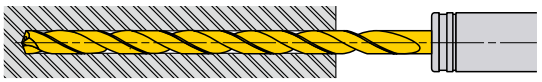
①Use the SB type drill.
②Use a drill with the same diameter as the deep hole drill.
③Drill depth : Approx 1DC.
④Ensure a high precision hole is drilled for the guide pilot.

2. Initial cutting with the long type drill



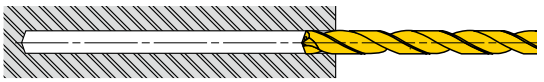
①Penetrate the pilot hole at a low revolution. (Revolution speed 500-1000 min^{-1}, feed rate .008-.012 IPR)
②Stop the long type drill .020-.039 inch short of the pilot hole bottom.

3. Drill the deep hole



①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

4. Drill retraction

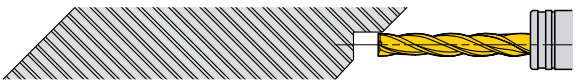


①After drilling, lower the cutting revolution about .020-.039 inch short of the hole end. (Revolution speed of around 500-1000 min^{-1})
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 inch/min.
③Finally clear the hole at a cutting speed of 65-100 SFM and feed rate of .008-.012 IPR.

IRREGULAR FACE DRILLING

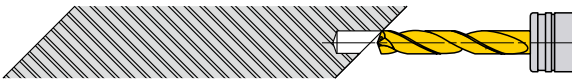
●Drilling and breaking through on irregular faces or angles

1. Spot facing



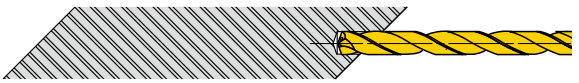
①Machine a flat on the irregular face by using an end mill or drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



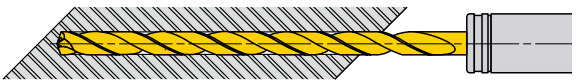
①Use a drill with the same or larger point angle than XB or DB type. The MWS-SB type is recommended.
②Ensure a high precision hole is drilled for the pilot.
③Drill depth : Approx 1DC.

3. Initial cutting with the long type drill



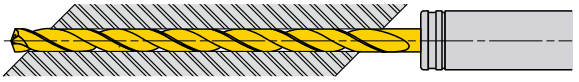
①Penetrate the pilot hole at a low revolution. (Revolution speed 500-1000 min^{-1}, feed rate .008-.012 IPR)
②Stop the long type drill .020-.039 inch short of the pilot hole bottom.

4. Drill the deep hole



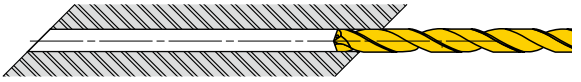
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

5. Breaking through



①When breaking through, the cutting edge can be damaged.
②Feed rate should be half the normal feed.

6. Drill retraction



①Finally clear the hole at a revolution speed of 500-1000 min^{-1}.
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 inch/min.

Memo

MMS

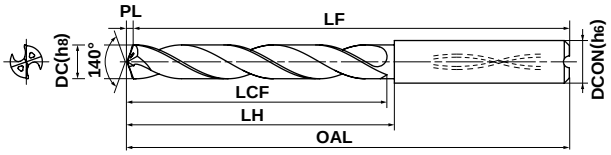
- New grade DP7020 and a unique margin, developed specifically for stainless steel, complement high flow coolant holes.
- Long drill life and high efficiency drilling in stainless steel.

P | **M** | K | N | S | H

Tolerance	DC=.1181	.1181<DC≤.2362	.2362<DC≤.3937	.3937<DC≤.7087	.7087<DC≤.7874
DC (inch)	0 −0.00055	0 −0.00071	0 −0.00087	0 −0.00106	0 −0.00130
DCON (inch)		0 −0.00031	0 −0.00035	0 −0.00043	0 −0.00051

Tolerance	DC=3	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤20
DC (mm)	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
DCON (mm)		0 −0.008	0 −0.009	0 −0.011	0 −0.013





*When looking at coating the color can vary depending on the direction of viewing. This does not have any effect on the performance of the drill.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions											
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP7020		LCF		LH		OAL		LF		PL		DCON	
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
3.0	.1181				3	Int.	●	MMS0300X3DB	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236
					5	Int.	●	MMS0300X5DB	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236
3.048	.1200		31		3	Int.	●	MMS0305X3D060	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236
					5	Int.	●	MMS0305X5D060	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236
3.1	.1220				3	Int.	●	MMS0310X3DB	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236
					5	Int.	●	MMS0310X5DB	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236
3.175	.1250	1/8			3	Int.	●	MMS0318X3D060	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236
					5	Int.	●	MMS0318X5D060	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236
3.2	.1260				3	Int.	●	MMS0320X3DB	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236
					5	Int.	●	MMS0320X5DB	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236
3.3	.1299			M4x0.7	3	Int.	●	MMS0330X3DB	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236
					5	Int.	●	MMS0330X5DB	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236
3.4	.1339				3	Int.	●	MMS0340X3DB	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236
					5	Int.	●	MMS0340X5DB	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236
3.5	.1378				3	Int.	●	MMS0350X3DB	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236
					5	Int.	●	MMS0350X5DB	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236
3.572	.1406	9/64			3	Int.	●	MMS0357X3D060	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236
					5	Int.	●	MMS0357X5D060	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236
3.6	.1417				3	Int.	●	MMS0360X3DB	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236
					5	Int.	●	MMS0360X5DB	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236
3.7	.1457			M4.5x0.75	3	Int.	●	MMS0370X3DB	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236
					5	Int.	●	MMS0370X5DB	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236
3.8	.1496		25	#10-24	3	Int.	●	MMS0380X3DB	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236
					5	Int.	●	MMS0380X5DB	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236
3.9	.1535				3	Int.	●	MMS0390X3DB	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236
					5	Int.	●	MMS0390X5DB	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236
3.969	.1562	5/32			3	Int.	●	MMS0397X3D060	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236
					5	Int.	●	MMS0397X5D060	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236
4.0	.1575				3	Int.	●	MMS0400X3DB	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236
					5	Int.	●	MMS0400X5DB	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236
4.039	.1590		21	#10-32	3	Int.	●	MMS0404X3D060	24.7	.972	26.7	1.051	73.7	2.902	73	2.874	0.7	.028	6	.236
					5	Int.	●	MMS0404X5D060	33.7	1.327	35.7	1.406	82.7	3.256	82	3.228	0.7	.028	6	.236
4.1	.1614				3	Int.	●	MMS0410X3DB	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236
					5	Int.	●	MMS0410X5DB	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions											
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP7020		LCF		LH		OAL		LF		PL		DCON	
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
4.2	**.1654**			**M5x0.8**	3	Int.	●	**MMS0420X3DB**	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236
					5	Int.	●	**MMS0420X5DB**	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236
4.3	**.1693**				3	Int.	●	**MMS0430X3DB**	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236
					5	Int.	●	**MMS0430X5DB**	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236
4.366	**.1719**	**11/64**			3	Int.	●	**MMS0437X3D060**	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236
					5	Int.	●	**MMS0437X5D060**	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236
4.4	**.1732**				3	Int.	●	**MMS0440X3DB**	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236
					5	Int.	●	**MMS0440X5DB**	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236
4.5	**.1772**		**16**	**#12-24**	3	Int.	●	**MMS0450X3DB**	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236
					5	Int.	●	**MMS0450X5DB**	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236
4.6	**.1811**				3	Int.	●	**MMS0460X3DB**	25.8	1.016	28.8	1.134	75.8	2.984	75	2.953	0.8	.031	6	.236
					5	Int.	●	**MMS0460X5DB**	35.8	1.409	38.8	1.528	85.8	3.378	85	3.346	0.8	.031	6	.236
4.7	**.1850**		**13**		3	Int.	●	**MMS0470X3DB**	25.9	1.020	28.9	1.138	75.9	2.988	75	2.953	0.9	.035	6	.236
					5	Int.	●	**MMS0470X5DB**	35.9	1.413	38.9	1.531	85.9	3.382	85	3.346	0.9	.035	6	.236
4.763	**.1875**	**3/16**			3	Int.	●	**MMS0476X3D060**	25.9	1.020	28.9	1.138	75.9	2.988	75	2.953	0.9	.035	6	.236
					5	Int.	●	**MMS0476X5D060**	35.9	1.413	38.9	1.531	85.9	3.382	85	3.346	0.9	.035	6	.236
4.8	**.1890**				3	Int.	●	**MMS0480X3DB**	25.9	1.020	28.9	1.138	75.9	2.988	75	2.953	0.9	.035	6	.236
					5	Int.	●	**MMS0480X5DB**	35.9	1.413	38.9	1.531	85.9	3.382	85	3.346	0.9	.035	6	.236
4.9	**.1929**				3	Int.	●	**MMS0490X3DB**	25.9	1.020	28.9	1.138	75.9	2.988	75	2.953	0.9	.035	6	.236
					5	Int.	●	**MMS0490X5DB**	35.9	1.413	38.9	1.531	85.9	3.382	85	3.346	0.9	.035	6	.236
5.0	**.1969**			**M6x1.0**	3	Int.	●	**MMS0500X3DB**	25.9	1.020	28.9	1.138	75.9	2.988	75	2.953	0.9	.035	6	.236
					5	Int.	●	**MMS0500X5DB**	35.9	1.413	38.9	1.531	85.9	3.382	85	3.346	0.9	.035	6	.236
5.1	**.2008**		**7**	**1/4-20**	3	Int.	●	**MMS0510X3DB**	28.9	1.138	30.9	1.217	81.9	3.224	81	3.189	0.9	.035	6	.236
					5	Int.	●	**MMS0510X5DB**	39.9	1.571	42.9	1.689	89.9	3.539	89	3.504	0.9	.035	6	.236
5.159	**.2031**	**13/64**			3	Int.	●	**MMS0516X3D060**	28.9	1.138	30.9	1.217	81.9	3.224	81	3.189	0.9	.035	6	.236
					5	Int.	●	**MMS0516X5D060**	39.9	1.571	42.9	1.689	89.9	3.539	89	3.504	0.9	.035	6	.236
5.2	**.2047**				3	Int.	●	**MMS0520X3DB**	29.0	1.142	31.0	1.220	82.0	3.228	81	3.189	1.0	.039	6	.236
					5	Int.	●	**MMS0520X5DB**	40.0	1.575	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236
5.3	**.2087**				3	Int.	●	**MMS0530X3DB**	29.0	1.142	31.0	1.220	82.0	3.228	81	3.189	1.0	.039	6	.236
					5	Int.	●	**MMS0530X5DB**	40.0	1.575	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236
5.4	**.2126**		**3**	**1/4-28**	3	Int.	●	**MMS0540X3DB**	29.0	1.142	31.0	1.220	82.0	3.228	81	3.189	1.0	.039	6	.236
					5	Int.	●	**MMS0540X5DB**	40.0	1.575	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236
5.5	**.2165**				3	Int.	●	**MMS0550X3DB**	29.0	1.142	31.0	1.220	820	3.228	81	3.189	1.0	.039	6	.236
					5	Int.	●	**MMS0550X5DB**	40.0	1.575	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236
5.556	**.2188**	**7/32**			3	Int.	●	**MMS0556X3D060**	31.0	1.220	31.0	1.220	82.0	3.228	81	3.189	1.0	.039	6	.236
					5	Int.	●	**MMS0556X5D060**	43.0	1.693	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236
5.6	**.2205**				3	Int.	●	**MMS0560X3DB**	31.0	1.220	31.0	1.220	82.0	3.228	81	3.189	1.0	.039	6	.236
					5	Int.	●	**MMS0560X5DB**	43.0	1.693	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236
5.7	**.2244**				3	Int.	●	**MMS0570X3DB**	31.0	1.220	31.0	1.220	82.0	3.228	81	3.189	1.0	.039	6	.236
					5	Int.	●	**MMS0570X5DB**	43.0	1.693	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236
5.8	**.2283**		**1**		3	Int.	●	**MMS0580X3DB**	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236
					5	Int.	●	**MMS0580X5DB**	43.1	1.697	43.1	1.697	90.1	3.547	89	3.504	1.1	.043	6	.236
5.9	**.2323**				3	Int.	●	**MMS0590X3DB**	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236
					5	Int.	●	**MMS0590X5DB**	43.1	1.697	43.1	1.697	90.1	3.547	89	3.504	1.1	.043	6	.236
5.953	**.2344**	**15/64**			3	Int.	●	**MMS0595X3D060**	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236
					5	Int.	●	**MMS0595X5D060**	43.1	1.697	43.1	1.697	90.1	3.547	89	3.504	1.1	.043	6	.236
6.0	**.2362**			**M7x1.0**	3	Int.	●	**MMS0600X3DB**	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236
					5	Int.	●	**MMS0600X5DB**	43.1	1.697	43.1	1.697	90.1	3.547	89	3.504	1.1	.043	6	.236

MMS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions									
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP7020		LCF		LH		OAL		LF		PL		DCON	
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
6.1	.2402				3	Int.	●	MMS0610X3DB	34.1	1.343	36.1	1.421	87.1	3.429	86	3.386	1.1	.043	8	.315
					5	Int.	●	MMS0610X5DB	47.1	1.854	49.1	1.933	96.1	3.783	95	3.740	1.1	.043	8	.315
6.2	.2441				3	Int.	●	MMS0620X3DB	34.1	1.343	36.1	1.421	87.1	3.429	86	3.386	1.1	.043	8	.315
					5	Int.	●	MMS0620X5DB	47.1	1.854	49.1	1.933	96.1	3.783	95	3.740	1.1	.043	8	.315
6.3	.2480				3	Int.	●	MMS0630X3DB	34.2	1.346	36.2	1.425	87.2	3.433	86	3.386	1.2	.047	8	.315
					5	Int.	●	MMS0630X5DB	47.2	1.858	49.2	1.937	96.2	3.787	95	3.740	1.2	.047	8	.315
6.350	.2500	1/4	E		3	Int.	●	MMS0635X3D080	34.2	1.346	36.2	1.425	87.2	3.433	86	3.386	1.2	.047	8	.315
					5	Int.	●	MMS0635X5D080	47.2	1.858	49.2	1.937	96.2	3.787	95	3.740	1.2	.047	8	.315
6.4	.2520				3	Int.	●	MMS0640X3DB	34.2	1.346	36.2	1.425	87.2	3.433	86	3.386	1.2	.047	8	.315
					5	Int.	●	MMS0640X5DB	47.2	1.858	49.2	1.937	96.2	3.787	95	3.740	1.2	.047	8	.315
6.5	.2559				3	Int.	●	MMS0650X3DB	34.2	1.346	36.2	1.425	87.2	3.433	86	3.386	1.2	.047	8	.315
					5	Int.	●	MMS0650X5DB	47.2	1.858	49.2	1.937	96.2	3.787	95	3.740	1.2	.047	8	.315
6.528	.2570		F	5/16-18	3	Int.	●	MMS0653X3D080	36.2	1.425	38.2	1.504	91.2	3.591	90	3.543	1.2	.047	8	.315
					5	Int.	●	MMS0653X5D080	50.2	1.976	52.2	2.055	99.2	3.906	98	3.858	1.2	.047	8	.315
6.6	.2598				3	Int.	●	MMS0660X3DB	36.2	1.425	38.2	1.504	91.2	3.591	90	3.543	1.2	.047	8	.315
					5	Int.	●	MMS0660X5DB	50.2	1.976	52.2	2.055	99.2	3.906	98	3.858	1.2	.047	8	.315
6.7	.2638			M8x1.25	3	Int.	●	MMS0670X3DB	36.2	1.425	38.2	1.504	91.2	3.591	90	3.543	1.2	.047	8	.315
					5	Int.	●	MMS0670X5DB	50.2	1.976	52.2	2.055	99.2	3.906	98	3.858	1.2	.047	8	.315
6.747	.2656	17/64			3	Int.	●	MMS0675X3D080	36.2	1.425	38.2	1.504	91.2	3.591	90	3.543	1.2	.047	8	.315
					5	Int.	●	MMS0675X5D080	50.2	1.976	52.2	2.055	99.2	3.906	98	3.858	1.2	.047	8	.315
6.8	.2677				3	Int.	●	MMS0680X3DB	36.2	1.425	38.2	1.504	91.2	3.591	90	3.543	1.2	.047	8	.315
					5	Int.	●	MMS0680X5DB	50.2	1.976	52.2	2.055	99.2	3.906	98	3.858	1.2	.047	8	.315
6.9	.2717		I	5/16-24	3	Int.	●	MMS0690X3DB	36.3	1.429	38.3	1.508	91.3	3.594	90	3.543	1.3	.051	8	.315
					5	Int.	●	MMS0690X5DB	50.3	1.980	52.3	2.059	99.3	3.909	98	3.858	1.3	.051	8	.315
7.0	.2756			M8x1.0	3	Int.	●	MMS0700X3DB	36.3	1.429	38.3	1.508	91.3	3.594	90	3.543	1.3	.051	8	.315
					5	Int.	●	MMS0700X5DB	50.3	1.980	52.3	2.059	99.3	3.909	98	3.858	1.3	.051	8	.315
7.1	.2795				3	Int.	●	MMS0710X3DB	39.3	1.547	40.3	1.587	91.3	3.594	90	3.543	1.3	.051	8	.315
					5	Int.	●	MMS0710X5DB	54.3	2.138	57.3	2.256	104.3	4.106	103	4.055	1.3	.051	8	.315
7.144	.2812	9/32			3	Int.	●	MMS0714X3D080	39.3	1.547	40.3	1.587	91.3	3.594	90	3.543	1.3	.051	8	.315
					5	Int.	●	MMS0714X5D080	54.3	2.138	57.3	2.256	104.3	4.106	103	4.055	1.3	.051	8	.315
7.2	.2835				3	Int.	●	MMS0720X3DB	39.3	1.547	40.3	1.587	91.3	3.594	90	3.543	1.3	.051	8	.315
					5	Int.	●	MMS0720X5DB	54.3	2.138	57.3	2.256	104.3	4.106	103	4.055	1.3	.051	8	.315
7.3	.2874				3	Int.	●	MMS0730X3DB	39.3	1.547	40.3	1.587	91.3	3.594	90	3.543	1.3	.051	8	.315
					5	Int.	●	MMS0730X5DB	54.3	2.138	57.3	2.256	104.3	4.106	103	4.055	1.3	.051	8	.315
7.4	.2913				3	Int.	●	MMS0740X3DB	39.4	1.551	40.4	1.591	91.4	3.598	90	3.543	1.4	.055	8	.315
					5	Int.	●	MMS0740X5DB	54.4	2.142	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315
7.5	.2953				3	Int.	●	MMS0750X3DB	39.4	1.551	40.4	1.591	91.4	3.598	90	3.543	1.4	.055	8	.315
					5	Int.	●	MMS0750X5DB	54.4	2.142	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315
7.541	.2969	19/64			3	Int.	●	MMS0754X3D080	41.4	1.630	41.4	1.630	91.4	3.598	90	3.543	1.4	.055	8	.315
					5	Int.	●	MMS0754X5D080	57.4	2.260	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315
7.6	.2992				3	Int.	●	MMS0760X3DB	41.4	1.630	41.4	1.630	91.4	3.598	90	3.543	1.4	.055	8	.315
					5	Int.	●	MMS0760X5DB	57.4	2.260	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315
7.7	.3031				3	Int.	●	MMS0770X3DB	41.4	1.630	41.4	1.630	91.4	3.598	90	3.543	1.4	.055	8	.315
					5	Int.	●	MMS0770X5DB	57.4	2.260	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315
7.8	.3071				3	Int.	●	MMS0780X3DB	41.4	1.630	41.4	1.630	91.4	3.598	90	3.543	1.4	.055	8	.315
					5	Int.	●	MMS0780X5DB	57.4	2.260	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315
7.9	.3110				3	Int.	●	MMS0790X3DB	41.4	1.630	41.4	1.630	91.4	3.598	90	3.543	1.4	.055	8	.315
					5	Int.	●	MMS0790X5DB	57.4	2.260	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions											
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP7020		LCF		LH		OAL		LF		PL		DCON	
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
7.938	**.3125**	**5/16**		**3/8-16**	3	Int.	●	**MMS0794X3D080**	41.4	1.630	41.4	1.630	91.4	3.598	90	3.543	1.4	.055	8	.315
					5	Int.	●	**MMS0794X5D080**	57.4	2.260	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315
8.0	**.3150**				3	Int.	●	**MMS0800X3DB**	41.5	1.634	41.5	1.634	91.5	3.602	90	3.543	1.5	.059	8	.315
					5	Int.	●	**MMS0800X5DB**	57.5	2.264	57.5	2.264	104.5	4.114	103	4.055	1.5	.059	8	.315
8.1	**.3189**				3	Int.	●	**MMS0810X3DB**	44.5	1.752	46.5	1.831	97.5	3.839	96	3.780	1.5	.059	10	.394
					5	Int.	●	**MMS0810X5DB**	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394
8.2	**.3228**				3	Int.	●	**MMS0820X3DB**	44.5	1.752	46.5	1.831	97.5	3.839	96	3.780	1.5	.059	10	.394
					5	Int.	●	**MMS0820X5DB**	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394
8.3	**.3268**				3	Int.	●	**MMS0830X3DB**	44.5	1.752	46.5	1.831	97.5	3.839	96	3.780	1.5	.059	10	.394
					5	Int.	●	**MMS0830X5DB**	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394
8.334	**.3281**	**21/64**			3	Int.	●	**MMS0833X3D100**	44.5	1.752	46.5	1.831	97.5	3.839	96	3.780	1.5	.059	10	.394
					5	Int.	●	**MMS0833X5D100**	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394
8.4	**.3307**				3	Int.	●	**MMS0840X3DB**	44.5	1.752	46.5	1.831	97.5	3.839	96	3.780	1.5	.059	10	.394
					5	Int.	●	**MMS0840X5DB**	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394
8.433	**.3320**		**Q**	**3/8-24**	3	Int.	●	**MMS0843X3D100**	44.5	1.752	46.5	1.831	97.5	3.839	96	3.780	1.5	.059	10	.394
					5	Int.	●	**MMS0843X5D100**	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394
8.5	**.3346**			**M10x1.5**	3	Int.	●	**MMS0850X3DB**	44.6	1.756	46.6	1.835	97.6	3.843	96	3.780	1.6	.063	10	.394
					5	Int.	●	**MMS0850X5DB**	61.6	2.425	63.6	2.504	114.6	4.512	113	4.449	1.6	.063	10	.394
8.6	**.3386**				3	Int.	●	**MMS0860X3DB**	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394
					5	Int.	●	**MMS0860X5DB**	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394
8.7	**.3425**			**M10x1.25**	3	Int.	●	**MMS0870X3DB**	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394
					5	Int.	●	**MMS0870X5DB**	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394
8.731	**.3438**	**11/32**			3	Int.	●	**MMS0873X3D100**	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394
					5	Int.	●	**MMS0873X5D100**	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394
8.8	**.3465**				3	Int.	●	**MMS0880X3DB**	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394
					5	Int.	●	**MMS0880X5DB**	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394
8.9	**.3504**				3	Int.	●	**MMS0890X3DB**	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394
					5	Int.	●	**MMS0890X5DB**	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394
9.0	**.3543**				3	Int.	●	**MMS0900X3DB**	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394
					5	Int.	●	**MMS0900X5DB**	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394
9.1	**.3583**				3	Int.	●	**MMS0910X3DB**	49.7	1.957	51.7	2.035	102.7	4.043	101	3.976	1.7	.067	10	.394
					5	Int.	●	**MMS0910X5DB**	68.7	2.705	71.7	2.823	122.7	4.831	121	4.764	1.7	.067	10	.394
9.128	**.3594**	**23/64**			3	Int.	●	**MMS0913X3D100**	49.7	1.957	51.7	2.035	102.7	4.043	101	3.976	1.7	.067	10	.394
					5	Int.	●	**MMS0913X5D100**	68.7	2.705	71.7	2.823	122.7	4.831	121	4.764	1.7	.067	10	.394
9.2	**.3622**				3	Int.	●	**MMS0920X3DB**	49.7	1.957	51.7	2.035	102.7	4.043	101	3.976	1.7	.067	10	.394
					5	Int.	●	**MMS0920X5DB**	68.7	2.705	71.7	2.823	122.7	4.831	121	4.764	1.7	.067	10	.394
9.3	**.3661**				3	Int.	●	**MMS0930X3DB**	49.7	1.957	51.7	2.035	102.7	4.043	101	3.976	1.7	.067	10	.394
					5	Int.	●	**MMS0930X5DB**	68.7	2.705	71.7	2.823	122.7	4.831	121	4.764	1.7	.067	10	.394
9.347	**.3680**		**U**	**7/16-14**	3	Int.	●	**MMS0935X3D100**	49.7	1.957	51.7	2.035	102.7	4.043	101	3.976	1.7	.067	10	.394
					5	Int.	●	**MMS0935X5D100**	68.7	2.705	71.7	2.823	122.7	4.831	121	4.764	1.7	.067	10	.394
9.4	**.3701**				3	Int.	●	**MMS0940X3DB**	49.7	1.957	51.7	2.035	102.7	4.043	101	3.976	1.7	.067	10	.394
					5	Int.	●	**MMS0940X5DB**	68.7	2.705	71.7	2.823	122.7	4.831	121	4.764	1.7	.067	10	.394
9.5	**.3740**				3	Int.	●	**MMS0950X3DB**	49.7	1.957	51.7	2.035	102.7	4.043	101	3.976	1.7	.067	10	.394
					5	Int.	●	**MMS0950X5DB**	68.7	2.705	71.7	2.823	122.7	4.831	121	4.764	1.7	.067	10	.394
9.525	**.3750**	**3/8**			3	Int.	●	**MMS0953X3D100**	51.7	2.035	51.7	2.035	102.7	4.043	101	3.976	1.7	.067	10	.394
					5	Int.	●	**MMS0953X5D100**	71.7	2.823	71.7	2.823	122.7	4.831	121	4.764	1.7	.067	10	.394
9.6	**.3780**				3	Int.	●	**MMS0960X3DB**	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394
					5	Int.	●	**MMS0960X5DB**	71.8	2.827	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394

CUTTING CONDITIONS ➤ L107 TECHNICAL DATA ➤ N001

MMS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions									
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP7020		LCF		LH		OAL		LF		PL		DCON	
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
9.7	.3819		Tube Sheet		3	Int.	●	MMS0970X3DB	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394
					5	Int.	●	MMS0970X5DB	71.8	2.827	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394
9.8	.3858				3	Int.	●	MMS0980X3DB	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394
					5	Int.	●	MMS0980X5DB	71.8	2.827	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394
9.9	.3898				3	Int.	●	MMS0990X3DB	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394
					5	Int.	●	MMS0990X5DB	71.8	2.827	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394
9.922	.3906	25/64		7/16-20	3	Int.	●	MMS0992X3D100	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394
					5	Int.	●	MMS0992X5D100	71.8	2.827	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394
10.0	.3937				3	Int.	●	MMS1000X3DB	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394
					5	Int.	●	MMS1000X5DB	71.8	2.827	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394
10.1	.3976				3	Int.	●	MMS1010X3DB	54.8	2.157	56.8	2.236	112.8	4.441	111	4.370	1.8	.071	12	.472
					5	Int.	●	MMS1010X5DB	75.8	2.984	79.8	3.142	135.8	5.346	134	5.276	1.8	.071	12	.472
10.2	.4016			M12x1.75	3	Int.	●	MMS1020X3DB	54.9	2.161	56.9	2.240	112.9	4.445	111	4.370	1.9	.075	12	.472
					5	Int.	●	MMS1020X5DB	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472
10.3	.4055				3	Int.	●	MMS1030X3DB	54.9	2.161	56.9	2.240	112.9	4.445	111	4.370	1.9	.075	12	.472
					5	Int.	●	MMS1030X5DB	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472
10.319	.4062	13/32			3	Int.	●	MMS1032X3D120	54.9	2.161	56.9	2.240	112.9	4.445	111	4.370	1.9	.075	12	.472
					5	Int.	●	MMS1032X5D120	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472
10.4	.4094				3	Int.	●	MMS1040X3DB	54.9	2.161	56.9	2.240	112.9	4.445	111	4.370	1.9	.075	12	.472
					5	Int.	●	MMS1040X5DB	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472
10.5	.4134				3	Int.	●	MMS1050X3DB	54.9	2.161	56.9	2.240	112.9	4.445	111	4.370	1.9	.075	12	.472
					5	Int.	●	MMS1050X5DB	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472
10.6	.4173				3	Int.	●	MMS1060X3DB	56.9	2.240	57.9	2.280	117.9	4.642	116	4.567	1.9	.075	12	.472
					5	Int.	●	MMS1060X5DB	78.9	3.106	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472
10.7	.4213				3	Int.	●	MMS1070X3DB	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472
					5	Int.	●	MMS1070X5DB	79.0	3.110	80.0	3.150	136.0	5.354	134	5.276	2.0	.079	12	.472
10.716	.4219	27/64		1/2-13	3	Int.	●	MMS1072X3D120	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472
					5	Int.	●	MMS1072X5D120	79.0	3.110	80.0	3.150	136.0	5.354	134	5.276	2.0	.079	12	.472
10.8	.4252			M12X1.25	3	Int.	●	MMS1080X3DB	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472
					5	Int.	●	MMS1080X5DB	79.0	3.110	80.0	3.150	136.0	5.354	134	5.276	2.0	.079	12	.472
10.9	.4291				3	Int.	●	MMS1090X3DB	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472
					5	Int.	●	MMS1090X5DB	79.0	3.110	80.0	3.150	136.0	5.354	134	5.276	2.0	.079	12	.472
11.0	.4331				3	Int.	●	MMS1100X3DB	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472
					5	Int.	●	MMS1100X5DB	79.0	3.110	80.0	3.150	136.0	5.354	134	5.276	2.0	.079	12	.472
11.1	.4370				3	Int.	●	MMS1110X3DB	60.0	2.362	62.0	2.441	118.0	4.646	116	4.567	2.0	.079	12	.472
					5	Int.	●	MMS1110X5DB	83.0	3.268	86.0	3.386	142.0	5.591	140	5.512	2.0	.079	12	.472
11.113	.4375	7/16			3	Int.	●	MMS1111X3D120	60.0	2.362	62.0	2.441	118.0	4.646	116	4.567	2.0	.079	12	.472
					5	Int.	●	MMS1111X5D120	83.0	3.268	86.0	3.386	142.0	5.591	140	5.512	2.0	.079	12	.472
11.2	.4409				3	Int.	●	MMS1120X3DB	60.0	2.362	62.0	2.441	118.0	4.646	116	4.567	2.0	.079	12	.472
					5	Int.	●	MMS1120X5DB	83.0	3.268	86.0	3.386	142.0	5.591	140	5.512	2.0	.079	12	.472
11.3	.4449				3	Int.	●	MMS1130X3DB	60.1	2.366	62.1	2.445	118.1	4.650	116	4.567	2.1	.083	12	.472
					5	Int.	●	MMS1130X5DB	83.1	3.272	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472
11.4	.4488				3	Int.	●	MMS1140X3DB	60.1	2.366	62.1	2.445	118.1	4.650	116	4.567	2.1	.083	12	.472
					5	Int.	●	MMS1140X5DB	83.1	3.272	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472
11.5	.4528				3	Int.	●	MMS1150X3DB	60.1	2.366	62.1	2.445	118.1	4.650	116	4.567	2.1	.083	12	.472
					5	Int.	●	MMS1150X5DB	83.1	3.272	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472
11.509	.4531	29/64		1/2-20	3	Int.	●	MMS1151X3D120	62.1	2.445	62.1	2.445	118.1	4.650	116	4.567	2.1	.083	12	.472
					5	Int.	●	MMS1151X5D120	86.1	3.390	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions											
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP7020		LCF		LH		OAL		LF		PL		DCON	
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
11.6	.4567				3	Int.	●	MMS1160X3DB	62.1	2.445	62.1	2.445	118.1	4.650	116	4.567	2.1	.083	12	.472
					5	Int.	●	MMS1160X5DB	86.1	3.390	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472
11.7	.4606				3	Int.	●	MMS1170X3DB	62.1	2.445	62.1	2.445	118.1	4.650	116	4.567	2.1	.083	12	.472
					5	Int.	●	MMS1170X5DB	86.1	3.390	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472
11.8	.4646				3	Int.	●	MMS1180X3DB	62.2	2.449	62.2	2.449	118.2	4.654	116	4.567	2.2	.087	12	.472
					5	Int.	●	MMS1180X5DB	86.2	3.394	86.2	3.394	142.2	5.598	140	5.512	2.2	.087	12	.472
11.9	.4685	15/32			3	Int.	●	MMS1190X3DB	62.2	2.449	62.2	2.449	118.2	4.654	116	4.567	2.2	.087	12	.472
					5	Int.	●	MMS1190X5DB	86.2	3.394	86.2	3.394	142.2	5.598	140	5.512	2.2	.087	12	.472
12.0	.4724			M14x2.0	3	Int.	●	MMS1200X3DB	62.2	2.449	62.2	2.449	118.2	4.654	116	4.567	2.2	.087	12	.472
					5	Int.	●	MMS1200X5DB	86.2	3.394	86.2	3.394	142.2	5.598	140	5.512	2.2	.087	12	.472
12.1	.4764				3	Int.	●	MMS1210X3DB	65.2	2.567	68.2	2.685	124.2	4.890	122	4.803	2.2	.087	14	.551
					5	Int.	●	MMS1210X5DB	90.2	3.551	94.2	3.709	150.2	5.913	148	5.827	2.2	.087	14	.551
12.2	.4803				3	Int.	●	MMS1220X3DB	65.2	2.567	68.2	2.685	124.2	4.890	122	4.803	2.2	.087	14	.551
					5	Int.	●	MMS1220X5DB	90.2	3.551	94.2	3.709	150.2	5.913	148	5.827	2.2	.087	14	.551
12.3	.4843	31/64		9/16-12	3	Int.	●	MMS1230X3DB	65.2	2.567	68.2	2.685	124.2	4.890	122	4.803	2.2	.087	14	.551
					5	Int.	●	MMS1230X5DB	90.2	3.551	94.2	3.709	150.2	5.913	148	5.827	2.2	.087	14	.551
12.4	.4882				3	Int.	●	MMS1240X3DB	65.3	2.571	68.3	2.689	124.3	4.894	122	4.803	2.3	.091	14	.551
					5	Int.	●	MMS1240X5DB	90.3	3.555	94.3	3.713	150.3	5.917	148	5.827	2.3	.091	14	.551
12.5	.4921			M14x1.5	3	Int.	●	MMS1250X3DB	65.3	2.571	68.3	2.689	124.3	4.894	122	4.803	2.3	.091	14	.551
					5	Int.	●	MMS1250X5DB	90.3	3.555	94.3	3.713	150.3	5.917	148	5.827	2.3	.091	14	.551
12.6	.4961				3	Int.	●	MMS1260X3DB	67.3	2.650	68.3	2.689	124.3	4.894	122	4.803	2.3	.091	14	.551
					5	Int.	●	MMS1260X5DB	93.3	3.673	94.3	3.713	150.3	5.917	148	5.827	2.3	.091	14	.551
12.7	.5000	1/2			3	Int.	●	MMS1270X3DB	67.3	2.650	68.3	2.689	124.3	4.894	122	4.803	2.3	.091	14	.551
					5	Int.	●	MMS1270X5DB	93.3	3.673	94.3	3.713	150.3	5.917	148	5.827	2.3	.091	14	.551
12.8	.5039				3	Int.	●	MMS1280X3DB	67.3	2.650	68.3	2.689	124.3	4.894	122	4.803	2.3	.091	14	.551
					5	Int.	●	MMS1280X5DB	93.3	3.673	94.3	3.713	150.3	5.917	148	5.827	2.3	.091	14	.551
12.9	.5079				3	Int.	●	MMS1290X3DB	67.4	2.654	68.4	2.693	124.4	4.898	122	4.803	2.4	.094	14	.551
					5	Int.	●	MMS1290X5DB	93.4	3.677	94.4	3.717	150.4	5.921	148	5.827	2.4	.094	14	.551
13.0	.5118				3	Int.	●	MMS1300X3DB	67.4	2.654	68.4	2.693	124.4	4.898	122	4.803	2.4	.094	14	.551
					5	Int.	●	MMS1300X5DB	93.4	3.677	94.4	3.717	150.4	5.921	148	5.827	2.4	.094	14	.551
13.1	.5157	33/64		9/16-18	3	Int.	●	MMS1310X3DB	70.4	2.772	72.4	2.850	128.4	5.055	126	4.961	2.4	.094	14	.551
					5	Int.	●	MMS1310X5DB	97.4	3.835	100.4	3.953	156.4	6.157	154	6.063	2.4	.094	14	.551
13.2	.5197				3	Int.	●	MMS1320X3DB	70.4	2.772	72.4	2.850	128.4	5.055	126	4.961	2.4	.094	14	.551
					5	Int.	●	MMS1320X5DB	97.4	3.835	100.4	3.953	156.4	6.157	154	6.063	2.4	.094	14	.551
13.3	.5236				3	Int.	●	MMS1330X3DB	70.4	2.772	72.4	2.850	128.4	5.055	126	4.961	2.4	.094	14	.551
					5	Int.	●	MMS1330X5DB	97.4	3.835	100.4	3.953	156.4	6.157	154	6.063	2.4	.094	14	.551
13.4	.5276				3	Int.	●	MMS1340X3DB	70.4	2.772	72.4	2.850	128.4	5.055	126	4.961	2.4	.094	14	.551
					5	Int.	●	MMS1340X5DB	97.4	3.835	100.4	3.953	156.4	6.157	154	6.063	2.4	.094	14	.551
13.5	.5315	17/32		5/8-11	3	Int.	●	MMS1350X3DB	70.5	2.776	72.5	2.854	128.5	5.059	126	4.961	2.5	.098	14	.551
					5	Int.	●	MMS1350X5DB	97.5	3.839	100.5	3.957	156.5	6.161	154	6.063	2.5	.098	14	.551
13.6	.5354				3	Int.	●	MMS1360X3DB	72.5	2.854	72.5	2.854	128.5	5.059	126	4.961	2.5	.098	14	.551
					5	Int.	●	MMS1360X5DB	100.5	3.957	100.5	3.957	156.5	6.161	154	6.063	2.5	.098	14	.551
13.7	.5394				3	Int.	●	MMS1370X3DB	72.5	2.854	72.5	2.854	128.5	5.059	126	4.961	2.5	.098	14	.551
					5	Int.	●	MMS1370X5DB	100.5	3.957	100.5	3.957	156.5	6.161	154	6.063	2.5	.098	14	.551
13.8	.5433				3	Int.	●	MMS1380X3DB	72.5	2.854	72.5	2.854	128.5	5.059	126	4.961	2.5	.098	14	.551
					5	Int.	●	MMS1380X5DB	100.5	3.957	100.5	3.957	156.5	6.161	154	6.063	2.5	.098	14	.551
13.891	.5469	35/64			3	Int.	●	MMS1389X3D140	72.5	2.854	72.5	2.854	128.5	5.059	126	4.961	2.5	.098	14	.551
					5	Int.	●	MMS1389X5D140	100.5	3.957	100.5	3.957	156.5	6.161	154	6.063	2.5	.098	14	.551

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MMS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions									
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP7020		LCF		LH		OAL		LF		PL		DCON	
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
13.9	.5472				3	Int.	●	MMS1390X3DB	72.5	2.854	72.5	2.854	128.5	5.059	126	4.961	2.5	.098	14	.551
					5	Int.	●	MMS1390X5DB	100.5	3.957	100.5	3.957	156.5	6.161	154	6.063	2.5	.098	14	.551
14.0	.5512			M16x2.0	3	Int.	●	MMS1400X3DB	72.6	2.858	72.6	2.858	128.6	5.063	126	4.961	2.6	.102	14	.551
					5	Int.	●	MMS1400X5DB	100.6	3.961	100.6	3.961	156.6	6.165	154	6.063	2.6	.102	14	.551
14.1	.5551				3	Int.	●	MMS1410X3DB	75.6	2.976	78.6	3.094	137.6	5.417	135	5.315	2.6	.102	16	.630
					5	Int.	●	MMS1410X5DB	104.6	4.118	108.6	4.276	167.6	6.598	165	6.496	2.6	.102	16	.630
14.2	.5591				3	Int.	●	MMS1420X3DB	75.6	2.976	78.6	3.094	137.6	5.417	135	5.315	2.6	.102	16	.630
					5	Int.	●	MMS1420X5DB	104.6	4.118	108.6	4.276	167.6	6.598	165	6.496	2.6	.102	16	.630
14.288	.5625	9/16			3	Int.	●	MMS1429X3D160	75.6	2.976	78.6	3.094	137.6	5.417	135	5.315	2.6	.102	16	.630
					5	Int.	●	MMS1429X5D160	104.6	4.118	108.6	4.276	167.6	6.598	165	6.496	2.6	.102	16	.630
14.3	.5630				3	Int.	●	MMS1430X3DB	75.6	2.976	78.6	3.094	137.6	5.417	135	5.315	2.6	.102	16	.630
					5	Int.	●	MMS1430X5DB	104.6	4.118	108.6	4.276	167.6	6.598	165	6.496	2.6	.102	16	.630
14.4	.5670				3	Int.	●	MMS1440X3DB	75.6	2.976	78.6	3.094	137.6	5.417	135	5.315	2.6	.102	16	.630
					5	Int.	●	MMS1440X5DB	104.6	4.118	108.6	4.276	167.6	6.598	165	6.496	2.6	.102	16	.630
14.5	.5709			M16x1.5	3	Int.	●	MMS1450X3DB	75.6	2.976	78.6	3.094	137.6	5.417	135	5.315	2.6	.102	16	.630
					5	Int.	●	MMS1450X5DB	104.6	4.118	108.6	4.276	167.6	6.598	165	6.496	2.6	.102	16	.630
14.6	.5748				3	Int.	●	MMS1460X3DB	77.7	3.059	78.7	3.098	137.7	5.421	135	5.315	2.7	.106	16	.630
					5	Int.	●	MMS1460X5DB	107.7	4.240	108.7	4.280	167.7	6.602	165	6.496	2.7	.106	16	.630
14.684	.5781	37/64		5/8-18	3	Int.	●	MMS1468X3D160	77.7	3.059	78.7	3.098	137.7	5.421	135	5.315	2.7	.106	16	.630
					5	Int.	●	MMS1468X5D160	107.7	4.240	108.7	4.280	167.7	6.602	165	6.496	2.7	.106	16	.630
14.7	.5787				3	Int.	●	MMS1470X3DB	77.7	3.059	78.7	3.098	137.7	5.421	135	5.315	2.7	.106	16	.630
					5	Int.	●	MMS1470X5DB	107.7	4.240	108.7	4.280	167.7	6.602	165	6.496	2.7	.106	16	.630
14.8	.5827				3	Int.	●	MMS1480X3DB	77.7	3.059	78.7	3.098	137.7	5.421	135	5.315	2.7	.106	16	.630
					5	Int.	●	MMS1480X5DB	107.7	4.240	108.7	4.280	167.7	6.602	165	6.496	2.7	.106	16	.630
14.9	.5866				3	Int.	●	MMS1490X3DB	77.7	3.059	78.7	3.098	137.7	5.421	135	5.315	2.7	.106	16	.630
					5	Int.	●	MMS1490X5DB	107.7	4.240	108.7	4.280	167.7	6.602	165	6.496	2.7	.106	16	.630
15.0	.5906				3	Int.	●	MMS1500X3DB	77.7	3.059	78.7	3.098	137.7	5.421	135	5.315	2.7	.106	16	.630
					5	Int.	●	MMS1500X5DB	107.7	4.240	108.7	4.280	167.7	6.602	165	6.496	2.7	.106	16	.630
15.081	.5938	19/32			3	Int.	●	MMS1508X3D160	80.7	3.177	82.7	3.256	141.7	5.579	139	5.472	2.7	.106	16	.630
					5	Int.	●	MMS1508X5D160	111.7	4.398	114.7	4.516	173.7	6.839	171	6.732	2.7	.106	16	.630
15.1	.5945				3	Int.	●	MMS1510X3DB	80.8	3.181	82.8	3.260	141.8	5.583	139	5.472	2.8	.110	16	.630
					5	Int.	●	MMS1510X5DB	111.8	4.402	114.8	4.520	173.8	6.843	171	6.732	2.8	.110	16	.630
15.2	.5984				3	Int.	●	MMS1520X3DB	80.8	3.181	82.8	3.260	141.8	5.583	139	5.472	2.8	.110	16	.630
					5	Int.	●	MMS1520X5DB	111.8	4.402	114.8	4.520	173.8	6.843	171	6.732	2.8	.110	16	.630
15.3	.6024				3	Int.	●	MMS1530X3DB	80.8	3.181	82.8	3.260	141.8	5.583	139	5.472	2.8	.110	16	.630
					5	Int.	●	MMS1530X5DB	111.8	4.402	114.8	4.520	173.8	6.843	171	6.732	2.8	.110	16	.630
15.4	.6063				3	Int.	●	MMS1540X3DB	80.8	3.181	82.8	3.260	141.8	5.583	139	5.472	2.8	.110	16	.630
					5	Int.	●	MMS1540X5DB	111.8	4.402	114.8	4.520	173.8	6.843	171	6.732	2.8	.110	16	.630
15.478	.6094	39/64			3	Int.	●	MMS1548X3D160	80.8	3.181	82.8	3.260	141.8	5.583	139	5.472	2.8	.110	16	.630
					5	Int.	●	MMS1548X5D160	111.8	4.402	114.8	4.520	173.8	6.843	171	6.732	2.8	.110	16	.630
15.5	.6102			M18x2.5	3	Int.	●	MMS1550X3DB	80.8	3.181	82.8	3.260	141.8	5.583	139	5.472	2.8	.110	16	.630
					5	Int.	●	MMS1550X5DB	111.8	4.402	114.8	4.520	173.8	6.843	171	6.732	2.8	.110	16	.630
15.6	.6142				3	Int.	●	MMS1560X3DB	82.8	3.260	82.8	3.260	141.8	5.583	139	5.472	2.8	.110	16	.630
					5	Int.	●	MMS1560X5DB	114.8	4.520	114.8	4.520	173.8	6.843	171	6.732	2.8	.110	16	.630
15.7	.6181				3	Int.	●	MMS1570X3DB	82.9	3.264	82.9	3.264	141.9	5.587	139	5.472	2.9	.114	16	.630
					5	Int.	●	MMS1570X5DB	114.9	4.524	114.9	4.524	173.9	6.846	171	6.732	2.9	.114	16	.630
15.8	.6220				3	Int.	●	MMS1580X3DB	82.9	3.264	82.9	3.264	141.9	5.587	139	5.472	2.9	.114	16	.630
					5	Int.	●	MMS1580X5DB	114.9	4.524	114.9	4.524	173.9	6.846	171	6.732	2.9	.114	16	.630

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. □ : Non stock, produced to order only.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions											
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP7020		LCF		LH		OAL		LF		PL		DCON	
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
15.875	.6250	5/8			3	Int.	●	MMS1588X3D160	82.9	3.264	82.9	3.264	141.9	5.587	139	5.472	2.9	.114	16	.630
					5	Int.	●	MMS1588X5D160	114.9	4.524	114.9	4.524	173.9	6.846	171	6.732	2.9	.114	16	.630
15.9	.6260				3	Int.	●	MMS1590X3DB	82.9	3.264	82.9	3.264	141.9	5.587	139	5.472	2.9	.114	16	.630
					5	Int.	●	MMS1590X5DB	114.9	4.524	114.9	4.524	173.9	6.846	171	6.732	2.9	.114	16	.630
16.0	.6299				3	Int.	●	MMS1600X3DB	82.9	3.264	82.9	3.264	141.9	5.587	139	5.472	2.9	.114	16	.630
					5	Int.	●	MMS1600X5DB	114.9	4.524	114.9	4.524	173.9	6.846	171	6.732	2.9	.114	16	.630
16.1	.6339				3	Int.	□	MMS1610X3DB	85.9	3.382	88.9	3.500	147.9	5.823	145	5.709	2.9	.114	18	.709
					5	Int.	□	MMS1610X5DB	118.9	4.681	122.9	4.839	181.9	7.161	179	7.047	2.9	.114	18	.709
16.2	.6378				3	Int.	□	MMS1620X3DB	86.0	3.386	89.0	3.504	148.0	5.827	145	5.709	3.0	.118	18	.709
					5	Int.	□	MMS1620X5DB	119.0	4.685	123.0	4.843	182.0	7.165	179	7.047	3.0	.118	18	.709
16.272	.6406	41/64			3	Int.	●	MMS1627X3D180	86.0	3.386	89.0	3.504	148.0	5.827	145	5.709	3.0	.118	18	.709
					5	Int.	●	MMS1627X5D180	119.0	4.685	123.0	4.843	182.0	7.165	179	7.047	3.0	.118	18	.709
16.3	.6417				3	Int.	□	MMS1630X3DB	86.0	3.386	89.0	3.504	148.0	5.827	145	5.709	3.0	.118	18	.709
					5	Int.	□	MMS1630X5DB	119.0	4.685	123.0	4.843	182.0	7.165	179	7.047	3.0	.118	18	.709
16.4	.6457				3	Int.	□	MMS1640X3DB	86.0	3.386	89.0	3.504	148.0	5.827	145	5.709	3.0	.118	18	.709
					5	Int.	□	MMS1640X5DB	119.0	4.685	123.0	4.843	182.0	7.165	179	7.047	3.0	.118	18	.709
16.5	.6496			M18x1.5	3	Int.	●	MMS1650X3DB	86.0	3.386	89.0	3.504	148.0	5.827	145	5.709	3.0	.118	18	.709
					5	Int.	●	MMS1650X5DB	119.0	4.685	123.0	4.843	182.0	7.165	179	7.047	3.0	.118	18	.709
16.6	.6535				3	Int.	□	MMS1660X3DB	88.0	3.465	89.0	3.504	148.0	5.827	145	5.709	3.0	.118	18	.709
					5	Int.	□	MMS1660X5DB	122.0	4.803	123.0	4.843	182.0	7.165	179	7.047	3.0	.118	18	.709
16.669	.6562	21/32		3/4-10	3	Int.	●	MMS1667X3D180	88.0	3.465	89.0	3.504	148.0	5.827	145	5.709	3.0	.118	18	.709
					5	Int.	●	MMS1667X5D180	122.0	4.803	123.0	4.843	182.0	7.165	179	7.047	3.0	.118	18	.709
16.7	.6575				3	Int.	□	MMS1670X3DB	88.0	3.465	89.0	3.504	148.0	5.827	145	5.709	3.0	.118	18	.709
					5	Int.	□	MMS1670X5DB	122.0	4.803	123.0	4.843	182.0	7.165	179	7.047	3.0	.118	18	.709
16.8	.6614				3	Int.	□	MMS1680X3DB	88.1	3.469	89.1	3.508	148.1	5.831	145	5.709	3.1	.122	18	.709
					5	Int.	□	MMS1680X5DB	122.1	4.807	123.1	4.846	182.1	7.169	179	7.047	3.1	.122	18	.709
16.9	.6654				3	Int.	□	MMS1690X3DB	88.1	3.469	89.1	3.508	148.1	5.831	145	5.709	3.1	.122	18	.709
					5	Int.	□	MMS1690X5DB	122.1	4.807	123.1	4.846	182.1	7.169	179	7.047	3.1	.122	18	.709
17.0	.6693		Tube Sheet		3	Int.	●	MMS1700X3DB	88.1	3.469	89.1	3.508	148.1	5.831	145	5.709	3.1	.122	18	.709
					5	Int.	●	MMS1700X5DB	122.1	4.807	123.1	4.846	182.1	7.169	179	7.047	3.1	.122	18	.709
17.066	.6719	43/64			3	Int.	●	MMS1707X3D180	91.1	3.587	93.1	3.665	152.1	5.988	149	5.866	3.1	.122	18	.709
					5	Int.	●	MMS1707X5D180	126.1	4.965	129.1	5.083	188.1	7.406	185	7.283	3.1	.122	18	.709
17.1	.6732				3	Int.	□	MMS1710X3DB	91.1	3.587	93.1	3.665	152.1	5.988	149	5.866	3.1	.122	18	.709
					5	Int.	□	MMS1710X5DB	126.1	4.965	129.1	5.083	188.1	7.406	185	7.283	3.1	.122	18	.709
17.2	.6772				3	Int.	□	MMS1720X3DB	91.1	3.587	93.1	3.665	152.1	5.988	149	5.866	3.1	.122	18	.709
					5	Int.	□	MMS1720X5DB	126.1	4.965	129.1	5.083	188.1	7.406	185	7.283	3.1	.122	18	.709
17.3	.6811				3	Int.	□	MMS1730X3DB	91.2	3.591	93.2	3.669	152.2	5.992	149	5.866	3.2	.126	18	.709
					5	Int.	□	MMS1730X5DB	126.2	4.969	129.2	5.087	188.2	7.409	185	7.283	3.2	.126	18	.709
17.4	.6850				3	Int.	□	MMS1740X3DB	91.2	3.591	93.2	3.669	152.2	5.992	149	5.866	3.2	.126	18	.709
					5	Int.	□	MMS1740X5DB	126.2	4.969	129.2	5.087	188.2	7.409	185	7.283	3.2	.126	18	.709
17.463	.6875	11/16		3/4-16	3	Int.	●	MMS1746X3D180	91.2	3.591	93.2	3.669	152.2	5.992	149	5.866	3.2	.126	18	.709
					5	Int.	●	MMS1746X5D180	126.2	4.969	129.2	5.087	188.2	7.409	185	7.283	3.2	.126	18	.709
17.5	.6890			M20x2.5	3	Int.	●	MMS1750X3DB	91.2	3.591	93.2	3.669	152.2	5.992	149	5.866	3.2	.126	18	.709
					5	Int.	●	MMS1750X5DB	126.2	4.969	129.2	5.087	188.2	7.409	185	7.283	3.2	.126	18	.709
17.6	.6929				3	Int.	□	MMS1760X3DB	93.2	3.669	93.2	3.669	152.2	5.992	149	5.866	3.2	.126	18	.709
					5	Int.	□	MMS1760X5DB	129.2	5.087	129.2	5.087	188.2	7.409	185	7.283	3.2	.126	18	.709
17.7	.6969				3	Int.	□	MMS1770X3DB	93.2	3.669	93.2	3.669	152.2	5.992	149	5.866	3.2	.126	18	.709
					5	Int.	□	MMS1770X5DB	129.2	5.087	129.2	5.087	188.2	7.409	185	7.283	3.2	.126	18	.709

CUTTING CONDITIONS ➤ L107 TECHNICAL DATA ➤ N001

MMS

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions									
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP7020		LCF		LH		OAL		LF		PL		DCON	
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
17.8	.7008				3	Int.	□	MMS1780X3DB	93.2	3.669	93.2	3.669	152.2	5.992	149	5.866	3.2	.126	18	.709
					5	Int.	□	MMS1780X5DB	129.2	5.087	129.2	5.087	188.2	7.409	185	7.283	3.2	.126	18	.709
17.859	.7031	45/64			3	Int.	●	MMS1786X3D180	93.3	3.673	93.3	3.673	152.3	5.996	149	5.866	3.3	.130	18	.709
					5	Int.	●	MMS1786X5D180	129.3	5.091	129.3	5.091	188.3	7.413	185	7.283	3.3	.130	18	.709
17.9	.7047				3	Int.	□	MMS1790X3DB	93.3	3.673	93.3	3.673	152.3	5.996	149	5.866	3.3	.130	18	.709
					5	Int.	□	MMS1790X5DB	129.3	5.091	129.3	5.091	188.3	7.413	185	7.283	3.3	.130	18	.709
18.0	.7087				3	Int.	●	MMS1800X3DB	93.3	3.673	93.3	3.673	152.3	5.996	149	5.866	3.3	.130	18	.709
					5	Int.	●	MMS1800X5DB	129.3	5.091	129.3	5.091	188.3	7.413	185	7.283	3.3	.130	18	.709
18.1	.7126				3	Int.	□	MMS1810X3DB	96.3	3.791	99.3	3.909	160.3	6.311	157	6.181	3.3	.130	20	.787
					5	Int.	□	MMS1810X5DB	133.3	5.248	137.3	5.406	198.3	7.807	195	7.677	3.3	.130	20	.787
18.2	.7165				3	Int.	□	MMS1820X3DB	96.3	3.791	99.3	3.909	160.3	6.311	157	6.181	3.3	.130	20	.787
					5	Int.	□	MMS1820X5DB	133.3	5.248	137.3	5.406	198.3	7.807	195	7.677	3.3	.130	20	.787
18.256	.7188	23/32			3	Int.	●	MMS1826X3D200	96.3	3.791	99.3	3.909	160.3	6.311	157	6.181	3.3	.130	20	.787
					5	Int.	●	MMS1826X5D200	133.3	5.248	137.3	5.406	198.3	7.807	195	7.677	3.3	.130	20	.787
18.3	.7205				3	Int.	□	MMS1830X3DB	96.3	3.791	99.3	3.909	160.3	6.311	157	6.181	3.3	.130	20	.787
					5	Int.	□	MMS1830X5DB	133.3	5.248	137.3	5.406	198.3	7.807	195	7.677	3.3	.130	20	.787
18.4	.7244				3	Int.	□	MMS1840X3DB	96.4	3.795	99.4	3.913	160.4	6.315	157	6.181	3.4	.134	20	.787
					5	Int.	□	MMS1840X5DB	133.4	5.252	137.4	5.409	198.4	7.811	195	7.677	3.4	.134	20	.787
18.5	.7283			M20x1.5	3	Int.	●	MMS1850X3DB	96.4	3.795	99.4	3.913	160.4	6.315	157	6.181	3.4	.134	20	.787
					5	Int.	●	MMS1850X5DB	133.4	5.252	137.4	5.409	198.4	7.811	195	7.677	3.4	.134	20	.787
18.6	.7323				3	Int.	□	MMS1860X3DB	98.4	3.874	99.4	3.913	160.4	6.315	157	6.181	3.4	.134	20	.787
					5	Int.	□	MMS1860X5DB	136.4	5.370	137.4	5.409	198.4	7.811	195	7.677	3.4	.134	20	.787
18.654	.7344	47/64			3	Int.	●	MMS1865X3D200	98.4	3.874	99.4	3.913	160.4	6.315	157	6.181	3.4	.134	20	.787
					5	Int.	●	MMS1865X5D200	136.4	5.370	137.4	5.409	198.4	7.811	195	7.677	3.4	.134	20	.787
18.7	.7362				3	Int.	□	MMS1870X3DB	98.4	3.874	99.4	3.913	160.4	6.315	157	6.181	3.4	.134	20	.787
					5	Int.	□	MMS1870X5DB	136.4	5.370	137.4	5.409	198.4	7.811	195	7.677	3.4	.134	20	.787
18.8	.7402				3	Int.	□	MMS1880X3DB	98.4	3.874	99.4	3.913	160.4	6.315	157	6.181	3.4	.134	20	.787
					5	Int.	□	MMS1880X5DB	136.4	5.370	137.4	5.409	198.4	7.811	195	7.677	3.4	.134	20	.787
18.9	.7441				3	Int.	□	MMS1890X3DB	98.4	3.874	99.4	3.913	160.4	6.315	157	6.181	3.4	.134	20	.787
					5	Int.	□	MMS1890X5DB	136.4	5.370	137.4	5.409	198.4	7.811	195	7.677	3.4	.134	20	.787
19.0	.7480				3	Int.	●	MMS1900X3DB	98.5	3.878	99.5	3.917	160.5	6.319	157	6.181	3.5	.138	20	.787
					5	Int.	●	MMS1900X5DB	136.5	5.374	137.5	5.413	198.5	7.815	195	7.677	3.5	.138	20	.787
19.050	.7500	3/4			3	Int.	●	MMS1905X3D200	101.5	3.996	103.5	4.075	164.5	6.476	161	6.339	3.5	.138	20	.787
					5	Int.	●	MMS1905X5D200	140.5	5.531	143.5	5.650	204.5	8.051	201	7.913	3.5	.138	20	.787
19.1	.7520				3	Int.	□	MMS1910X3DB	101.5	3.996	103.5	4.075	164.5	6.476	161	6.339	3.5	.138	20	.787
					5	Int.	□	MMS1910X5DB	140.5	5.531	143.5	5.650	204.5	8.051	201	7.913	3.5	.138	20	.787
19.2	.7559				3	Int.	□	MMS1920X3DB	101.5	3.996	103.5	4.075	164.5	6.476	161	6.339	3.5	.138	20	.787
					5	Int.	□	MMS1920X5DB	140.5	5.531	143.5	5.650	204.5	8.051	201	7.913	3.5	.138	20	.787
19.250	.7579		Tube Sheet		3	Int.	●	MMS1925X3D200	101.5	3.996	103.5	4.075	164.5	6.476	161	6.339	3.5	.138	20	.787
					5	Int.	●	MMS1925X5D200	140.5	5.531	143.5	5.650	204.5	8.051	201	7.913	3.5	.138	20	.787
19.3	.7598				3	Int.	□	MMS1930X3DB	101.5	3.996	103.5	4.075	164.5	6.476	161	6.339	3.5	.138	20	.787
					5	Int.	□	MMS1930X5DB	140.5	5.531	143.5	5.650	204.5	8.051	201	7.913	3.5	.138	20	.787
19.4	.7638				3	Int.	□	MMS1940X3DB	101.5	3.996	103.5	4.075	164.5	6.476	161	6.339	3.5	.138	20	.787
					5	Int.	□	MMS1940X5DB	140.5	5.531	143.5	5.650	204.5	8.051	201	7.913	3.5	.138	20	.787
19.447	.7656	49/64		7/8-9	3	Int.	●	MMS1945X3D200	101.5	3.996	103.5	4.075	164.5	6.476	161	6.339	3.5	.138	20	.787
					5	Int.	●	MMS1945X5D200	140.5	5.531	143.5	5.650	204.5	8.051	201	7.913	3.5	.138	20	.787
19.5	.7677			M22x2.5	3	Int.	●	MMS1950X3DB	101.6	4.000	103.6	4.079	164.6	6.480	161	6.339	3.6	.142	20	.787
					5	Int.	●	MMS1950X5DB	140.6	5.535	143.6	5.654	204.6	8.055	201	7.913	3.6	.142	20	.787

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained. □ : Non stock, produced to order only.

DC					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions											
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		DP7020		LCF		LH		OAL		LF		PL		DCON	
									mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
19.6	.7717				3	Int.	□	MMS1960X3DB	103.6	4.079	103.6	4.079	164.6	6.480	161	6.339	3.6	.142	20	.787
					5	Int.	□	MMS1960X5DB	143.6	5.654	143.6	5.654	204.6	8.055	201	7.913	3.6	.142	20	.787
19.7	.7756				3	Int.	□	MMS1970X3DB	103.6	4.079	103.6	4.079	164.6	6.480	161	6.339	3.6	.142	20	.787
					5	Int.	□	MMS1970X5DB	143.6	5.654	143.6	5.654	204.6	8.055	201	7.913	3.6	.142	20	.787
19.8	.7795				3	Int.	□	MMS1980X3DB	103.6	4.079	103.6	4.079	164.6	6.480	161	6.339	3.6	.142	20	.787
					5	Int.	□	MMS1980X5DB	143.6	5.654	143.6	5.654	204.6	8.055	201	7.913	3.6	.142	20	.787
19.844	.7812	25/32			3	Int.	●	MMS1984X3D200	103.6	4.079	103.6	4.079	164.6	6.480	161	6.339	3.6	.142	20	.787
					5	Int.	●	MMS1984X5D200	143.6	5.654	143.6	5.654	204.6	8.055	201	7.913	3.6	.142	20	.787
19.9	.7835				3	Int.	□	MMS1990X3DB	103.6	4.079	103.6	4.079	164.6	6.480	161	6.339	3.6	.142	20	.787
					5	Int.	□	MMS1990X5DB	143.6	5.654	143.6	5.654	204.6	8.055	201	7.913	3.6	.142	20	.787
20.0	.7874				3	Int.	●	MMS2000X3DB	103.6	4.079	103.6	4.079	164.6	6.480	161	6.339	3.6	.142	20	.787
					5	Int.	●	MMS2000X5DB	143.6	5.654	143.6	5.654	204.6	8.055	201	7.913	3.6	.142	20	.787

RECOMMENDED CUTTING CONDITIONS

MMS

Work Material	Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.		Austenitic Stainless Steel (>200HB) AISI 304LN, 316LN etc.	
Drill Dia. **DC**	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch / mm				
.1181 / 3.0	260 (195—330)	.0051 (.0031—.0071)	195 (150—260)	.0039 (.0020—.0059)
.1575 / 4.0	260 (195—330)	.0059 (.0039—.0079)	195 (150—260)	.0047 (.0031—.0071)
.1969 / 5.0	260 (195—330)	.0059 (.0039—.0079)	195 (150—260)	.0047 (.0031—.0071)
.2480 / 6.3	260 (195—330)	.0067 (.0047—.0087)	195 (150—260)	.0059 (.0039—.0079)
.3150 / 8.0	260 (195—330)	.0075 (.0055—.0094)	195 (150—260)	.0067 (.0047—.0087)
.3937 / 10.0	195 (150—230)	.0079 (.0059—.0098)	165 (130—195)	.0071 (.0051—.0091)
.4724 / 12.0	195 (150—230)	.0083 (.0063—.0102)	165 (130—195)	.0075 (.0055—.0094)
.6299 / 16.0	195 (150—230)	.0087 (.0067—.0106)	165 (130—195)	.0079 (.0059—.0098)
.7874 / 20.0	195 (150—230)	.0091 (.0071—.0110)	165 (130—195)	.0083 (.0063—.0102)

Work Material	Duplex Steel (≤280HB) AISI 329 etc.		Ferritic, Martensitic Stainless Steel (≤200HB) AISI 410, 430 etc.	
Drill Dia. **DC**	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch / mm				
.1181 / 3.0	165 (130—195)	.0039 (.0020—.0059)	260 (195—330)	.0051 (.0031—.0071)
.1575 / 4.0	165 (130—195)	.0047 (.0031—.0071)	260 (195—330)	.0059 (.0039—.0079)
.1969 / 5.0	165 (130—195)	.0047 (.0031—.0071)	260 (195—330)	.0059 (.0039—.0079)
.2480 / 6.3	165 (130—195)	.0059 (.0039—.0079)	260 (195—330)	.0067 (.0047—.0087)
.3150 / 8.0	165 (130—195)	.0067 (.0047—.0087)	260 (195—330)	.0075 (.0055—.0094)
.3937 / 10.0	130 (100—165)	.0071 (.0051—.0091)	195 (150—260)	.0079 (.0059—.0098)
.4724 / 12.0	130 (100—165)	.0075 (.0055—.0094)	195 (150—260)	.0083 (.0063—.0102)
.6299 / 16.0	130 (100—165)	.0079 (.0059—.0098)	195 (150—260)	.0087 (.0067—.0106)
.7874 / 20.0	130 (100—165)	.0083 (.0063—.0102)	195 (150—260)	.0083 (.0071—.0110)

(Note 1) For stable machining, internal coolant supply with high pressure is recommended.
(Note 2) Emulsion type of water coolant is recommended.
(Note 3) Recommended cutting conditions are for machining under the conditions of favorable machining environment and coolant. Please lower the cutting conditions if there is a problem in the rigidity of machine and workpiece, and coolant property or discharge amount.
(Note 4) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MMS

Work Material		Ferritic, Martensitic Stainless Steel (>200HB) AISI 431, 420 etc.		PH Stainless Steel (<450HB) S17400, S17700 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.1181	3.0	195 (150—260)	.0039 (.0020—.0059)	165 (130—195)	.0039 (.0020—.0059)
.1575	4.0	195 (150—260)	.0047 (.0031—.0071)	165 (130—195)	.0047 (.0031—.0071)
.1969	5.0	195 (150—260)	.0047 (.0031—.0071)	165 (130—195)	.0047 (.0031—.0071)
.2480	6.3	195 (150—260)	.0059 (.0039—.0079)	165 (130—195)	.0059 (.0039—.0079)
.3150	8.0	195 (150—260)	.0067 (.0047—.0087)	165 (130—195)	.0067 (.0047—.0087)
.3937	10.0	165 (130—195)	.0071 (.0051—.0091)	130 (100—165)	.0071 (.0051—.0091)
.4724	12.0	165 (130—195)	.0075 (.0055—.0094)	130 (100—165)	.0075 (.0055—.0094)
.6299	16.0	165 (130—195)	.0079 (.0059—.0098)	130 (100—165)	.0079 (.0059—.0098)
.7874	20.0	165 (130—195)	.0083 (.0063—.0102)	130 (100—165)	.0083 (.0063—.0102)

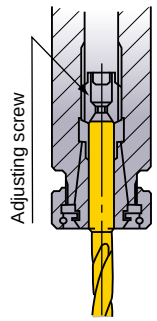
(Note 1) For stable machining, internal coolant supply with high pressure is recommended.
(Note 2) Emulsion type of water coolant is recommended.
(Note 3) Recommended cutting conditions are for machining under the conditions of favorable machining environment and coolant. Please lower the cutting conditions if there is a problem in the rigidity of machine and workpiece, and coolant property or discharge amount.
(Note 4) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

STAINLESS STEEL CROSS REFERENCE LIST

Work Material	No	USA	Japan	Germany	
		AISI/SAE	**JIS**	W-no.	DIN
Ferritic, Martensitic Stainless Steel	1	416	SUS416	1.4005	X12CrS3
		410	SUS410	1.4006	X10Cr13
		430	SUS430	1.4016	X6Cr17
		434	SUS434	1.4113	X6CrMo17
		430Ti	SUS430LX	1.4510	X6CrTi17
		409	—	1.4512	X6CrTi12
	2	420	SUS420J1	1.4021	X20Cr13
		431	SUS431	1.4057	X20CrNi17-2
		420	SUS420J2	1.4028	X30Cr13
		440C	SUS440C	1.4125	X10CrMo17
PH Stainless Steel	3	630 (17-4PH)	SUS630	1.4542	X5CrNiCuNb16 4
		S15500 (15-5PH)	—	1.4545	—
		631 (17-7PH)	SUS631	1.4568	X7CrNiAl17 7
Austenitic Stainless Steel	4	304	SUS304	1.4301	X5CrNi18 10
		305	SUS305	1.4303	X5CrNi8-12
		303	SUS303	1.4305	X12CrNiS18-9
		304L	SUS304L	1.4307	X2CrNi19-11
		316	SUS316	1.4401	X5CrNiMo17 12 2
	5	304LN	SUS304LN	1.4311	X2CrNiN18 10
		316L	SUS316L	1.4404	X2CrNiMo17 12 2
		316LN	SUS316LN	1.4406	X2CrNiMoN17 12 2
		—	SUS316L	1.4435	X2CrNiMo18 14 3
		317L	SUS317L	1.4438	X2CrNiMo18 15 4
		N08926	—	1.4529	X1NiCrMoCuN25 20 7
		321	SUS321	1.4541	X6CrNiTi18-10
		347	SUS347	1.4550	X6CrNiNb18-10
		316Ti	SUS316Ti	1.4571	X6CrNiMoTi17 12 2
Duplex Steel	6	—	—	1.4362	X2CrNiN23 4
		S32750	SCS14A	1.4410	X2CrNiMoN25 7 4
		329	SUS329J1	1.4460	X3CrNiMoN27 5 2
		S31803	SUS329J3L	1.4462	X2CrNiMoN22 5 3

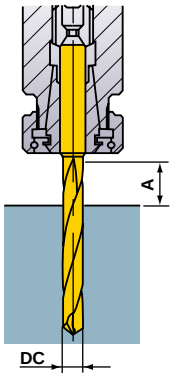
OPERATIONAL GUIDANCE FOR THE MMS DRILL

Drill holding



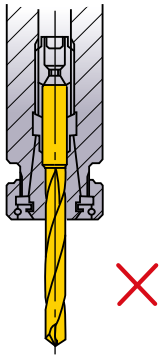
Thrust bearing type collet chuck holds the drill securely.

Drill holding



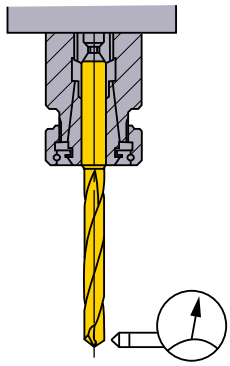
A ≥ DC x 1.5

Drill Installation



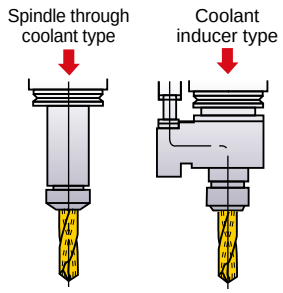
Do not clamp on the flutes.

Installation tolerance



Runout ≤ .001"

Through Coolant Type



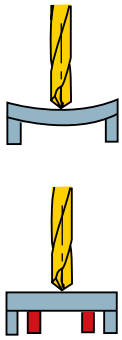
Coolant pressure is approx. 70 - 1015 PSI (0.5 - 7MPa).

Coolant handling

< MMS type >

1) Dirt and dust particles in old coolant can clog the oil hole and prevent effective flow. Regular coolant exchange is recommended.
2) Small particles of swarf will jam in the oil hole. Use a filter as a preventative measure. When using small diameter drills, use a fine mesh filter.

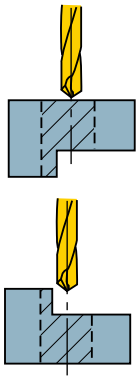
Thin workpieces



If bending occurs ×

Support the workpiece ○

Interrupted cutting



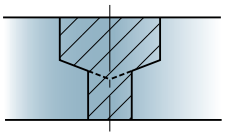
One process ○

①Lower the feed when drilling the interrupted part.

Requires prior machining △

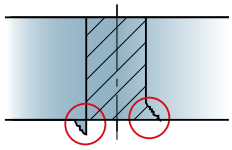
①Spot face with an end mill prior to drilling.

Stepped holes



①Divide the machining into two processes.
②Drill the larger hole first.
*Tools for chamfering and spot facing can be produced to order.

Burring and workpiece chipping



①Lower the feed rate when breaking through.
②Add a chamfer.
③Change the point angle.

DRILLING

MHS

- High web strength compliments a stablizing double margin design.
- Long drill life and no-peck drilling in harderned steel up to HRC55.

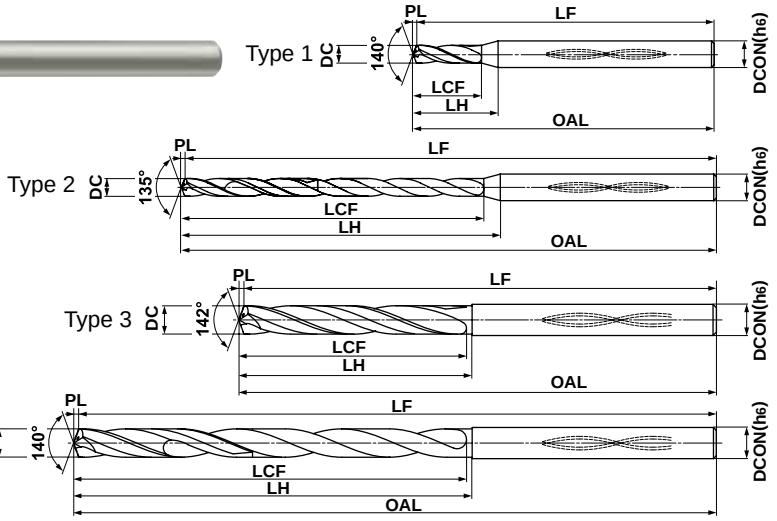
P | M | K | N | S | H

Tolerance	DC≤3	3<DC≤6	6<DC≤10	10<DC≤12
DC (mm)	+0.010 −0.002	+0.010 −0.002	+0.010 −0.005	+0.010 −0.008
DCON (mm)	0 −0.006	0 −0.008	0 −0.009	0 −0.011

METRIC STANDARD



Internal Coolant



(Note 1) MHS drills are suitable for use with shrink fit holders.
(Note 2) Use the shortest type in the respective diameter as a pilot drill.

Drill Diameter DC					Hole Depth	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d	VP15TF		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.95	.0374				3	★	MHS0095L006B	6.17	.243	9.97	.393	60.17	2.369	60	2.362	0.17	.007	3	.118	1
					6	★	MHS0095L009B	9.20	.362	13.00	.512	60.20	2.370	60	2.362	0.20	.008	3	.118	2
					13	★	MHS0095L015B	15.20	.598	19.00	.748	60.20	2.370	60	2.362	0.20	.008	3	.118	2
					23	★	MHS0095L025B	25.20	.992	29.00	1.142	60.20	2.370	60	2.362	0.20	.008	3	.118	2
					30	★	MHS0095L035B	35.20	1.386	39.00	1.535	80.20	3.157	80	3.150	0.20	.008	3	.118	2
1.00	.0394				3	★	MHS0100L006B	6.2	.244	9.9	.390	60.2	2.370	60	2.362	0.2	.008	3	.118	1
					6	★	MHS0100L009B	9.2	.362	12.9	.508	60.2	2.370	60	2.362	0.2	.008	3	.118	2
					12	★	MHS0100L015B	15.2	.598	18.9	.744	60.2	2.370	60	2.362	0.2	.008	3	.118	2
					22	★	MHS0100L025B	25.2	.992	28.9	1.138	60.2	2.370	60	2.362	0.2	.008	3	.118	2
					30	★	MHS0100L035B	35.2	1.386	38.9	1.531	80.2	3.157	80	3.150	0.2	.008	3	.118	2
1.10	.0433				2	★	MHS0110L006B	6.2	.244	9.7	.382	60.2	2.370	60	2.362	0.2	.008	3	.118	1
					5	★	MHS0110L009B	9.2	.362	12.7	.500	60.2	2.370	60	2.362	0.2	.008	3	.118	2
					11	★	MHS0110L015B	15.2	.598	18.7	.736	60.2	2.370	60	2.362	0.2	.008	3	.118	2
					20	★	MHS0110L025B	25.2	.992	28.7	1.130	60.2	2.370	60	2.362	0.2	.008	3	.118	2
					29	★	MHS0110L035B	35.2	1.386	38.7	1.524	80.2	3.157	80	3.150	0.2	.008	3	.118	2
1.20	.0472				2	★	MHS0120L006B	6.2	.244	9.6	.378	60.2	2.370	60	2.362	0.2	.008	3	.118	1
					5	★	MHS0120L009B	9.3	.366	12.7	.500	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					10	★	MHS0120L015B	15.3	.602	18.7	.736	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					18	★	MHS0120L025B	25.3	.996	28.7	1.130	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					26	★	MHS0120L035B	35.3	1.390	38.7	1.524	80.3	3.161	80	3.150	0.3	.012	3	.118	2
1.30	.0512				2	★	MHS0130L007B	7.2	.283	10.4	.409	60.2	2.370	60	2.362	0.2	.008	3	.118	1
					5	★	MHS0130L011B	11.3	.445	14.5	.571	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					12	★	MHS0130L020B	20.3	.799	23.5	.925	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					20	★	MHS0130L030B	30.3	1.193	33.5	1.319	80.3	3.161	80	3.150	0.3	.012	3	.118	2
					30	★	MHS0130L045B	45.3	1.783	48.5	1.909	80.3	3.161	80	3.150	0.3	.012	3	.118	2

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan.

Drill Diameter DC					Hole Depth	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d	VP15TF		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
1.40	.0551		54		2	★	MHS0140L007B	7.3	.287	10.3	.406	60.3	2.374	60	2.362	0.3	.012	3	.118	1
					5	★	MHS0140L011B	11.3	.445	14.3	.563	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					11	★	MHS0140L020B	20.3	.799	23.3	.917	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					18	★	MHS0140L030B	30.3	1.193	33.3	1.311	80.3	3.161	80	3.150	0.3	.012	3	.118	2
					29	★	MHS0140L045B	45.3	1.783	48.3	1.902	80.3	3.161	80	3.150	0.3	.012	3	.118	2
1.45	.0571				3	★	MHS0145L008B	8.3	.327	11.2	.441	60.3	2.374	60	2.362	0.3	.012	3	.118	1
					6	★	MHS0145L013B	13.3	.524	16.2	.638	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					11	★	MHS0145L020B	20.3	.799	23.2	.913	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					21	★	MHS0145L035B	35.3	1.390	38.2	1.504	80.3	3.161	80	3.150	0.3	.012	3	.118	2
					30	★	MHS0145L055B	55.3	2.177	58.2	2.291	100.3	3.949	100	3.937	0.3	.012	3	.118	2
1.50	.0591			#1-64	2	★	MHS0150L008B	8.3	.327	11.1	.437	60.3	2.374	60	2.362	0.3	.012	3	.118	1
					6	★	MHS0150L013B	13.3	.524	16.1	.634	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					10	★	MHS0150L020B	20.3	.799	23.1	.909	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					20	★	MHS0150L035B	35.3	1.390	38.1	1.500	80.3	3.161	80	3.150	0.3	.012	3	.118	2
					30	★	MHS0150L055B	55.3	2.177	58.1	2.287	100.3	3.949	100	3.937	0.3	.012	3	.118	2
1.60	.0630				2	★	MHS0160L008B	8.3	.327	10.9	.429	60.3	2.374	60	2.362	0.3	.012	3	.118	1
					5	★	MHS0160L013B	13.3	.524	15.9	.626	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					10	★	MHS0160L020B	20.3	.799	22.9	.902	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					19	★	MHS0160L035B	35.3	1.390	37.9	1.492	80.3	3.161	80	3.150	0.3	.012	3	.118	2
					30	★	MHS0160L055B	55.3	2.177	57.9	2.280	100.3	3.949	100	3.937	0.3	.012	3	.118	2
1.70	.0669		51		2	★	MHS0170L008B	8.3	.327	10.7	.421	60.3	2.374	60	2.362	0.3	.012	3	.118	1
					5	★	MHS0170L013B	13.4	.528	15.8	.622	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					9	★	MHS0170L020B	20.4	.803	22.8	.898	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					18	★	MHS0170L035B	35.4	1.394	37.8	1.488	80.4	3.165	80	3.150	0.4	.016	3	.118	2
					29	★	MHS0170L055B	55.4	2.181	57.8	2.276	100.4	3.953	100	3.937	0.4	.016	3	.118	2
1.80	.0709				3	★	MHS0180L010B	10.3	.406	12.5	.492	60.3	2.374	60	2.362	0.3	.012	3	.118	1
					5	★	MHS0180L015B	15.4	.606	17.6	.693	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					11	★	MHS0180L025B	25.4	1.000	27.6	1.087	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					22	★	MHS0180L045B	45.4	1.787	47.6	1.874	80.4	3.165	80	3.150	0.4	.016	3	.118	2
					30	★	MHS0180L065B	65.4	2.575	67.6	2.661	100.4	3.953	100	3.937	0.4	.016	3	.118	2
1.90	.0748				2	★	MHS0190L010B	10.4	.409	12.5	.492	60.4	2.378	60	2.362	0.4	.016	3	.118	1
					5	★	MHS0190L015B	15.4	.606	17.5	.689	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					10	★	MHS0190L025B	25.4	1.000	27.5	1.083	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					21	★	MHS0190L045B	45.4	1.787	47.5	1.870	80.4	3.165	80	3.150	0.4	.016	3	.118	2
					30	★	MHS0190L065B	65.4	2.575	67.5	2.657	100.4	3.953	100	3.937	0.4	.016	3	.118	2
1.95	.0768				2	★	MHS0195L010B	10.4	.409	12.4	.488	60.4	2.378	60	2.362	0.4	.016	3	.118	1
					5	★	MHS0195L015B	15.4	.606	17.4	.685	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					10	★	MHS0195L025B	25.4	1.000	27.4	1.079	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					20	★	MHS0195L045B	45.4	1.787	47.4	1.866	80.4	3.165	80	3.150	0.4	.016	3	.118	2
					30	★	MHS0195L065B	65.4	2.575	67.4	2.654	100.4	3.953	100	3.937	0.4	.016	3	.118	2
2.00	.0787			#3-48	2	★	MHS0200L010B	10.4	.409	12.3	.484	60.4	2.378	60	2.362	0.4	.016	3	.118	1
					5	★	MHS0200L015B	15.4	.606	17.3	.681	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					9	★	MHS0200L025B	25.4	1.000	27.3	1.075	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					20	★	MHS0200L045B	45.4	1.787	47.3	1.862	80.4	3.165	80	3.150	0.4	.016	3	.118	2
					30	★	MHS0200L065B	65.4	2.575	67.3	2.650	100.4	3.953	100	3.937	0.4	.016	3	.118	2

CUTTING CONDITIONS ➤ L126
HOW TO USE ➤ L127
TECHNICAL DATA ➤ N001

MHS

Drill Diameter DC					Hole Depth	Stock	Order Number	Dimensions										Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d	VP15TF		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.10	.0827				3	★	MHS0210L012B	12.4	.488	14.1	.555	60.4	2.378	60	2.362	0.4	.016	3	.118	1
					7	★	MHS0210L020B	20.4	.803	22.1	.870	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					11	★	MHS0210L030B	30.4	1.197	32.1	1.264	80.4	3.165	80	3.150	0.4	.016	3	.118	2
					23	★	MHS0210L055B	55.4	2.181	57.1	2.248	100.4	3.953	100	3.937	0.4	.016	3	.118	2
					30	★	MHS0210L075B	75.4	2.969	77.1	3.035	120.4	4.740	120	4.724	0.4	.016	3	.118	2
2.20	.0866				2	★	MHS0220L012B	12.4	.488	13.9	.547	60.4	2.378	60	2.362	0.4	.016	3	.118	1
					6	★	MHS0220L020B	20.5	.807	22.0	.866	60.5	2.382	60	2.362	0.5	.020	3	.118	2
					11	★	MHS0220L030B	30.5	1.201	32.0	1.260	80.5	3.169	80	3.150	0.5	.020	3	.118	2
					22	★	MHS0220L055B	55.5	2.185	57.0	2.244	100.5	3.957	100	3.937	0.5	.020	3	.118	2
					30	★	MHS0220L075B	75.5	2.972	77.0	3.031	120.5	4.744	120	4.724	0.5	.020	3	.118	2
2.30	.0906				2	★	MHS0230L012B	12.4	.488	13.7	.539	60.4	2.378	60	2.362	0.4	.016	3	.118	1
					6	★	MHS0230L020B	20.5	.807	21.8	.858	60.5	2.382	60	2.362	0.5	.020	3	.118	2
					10	★	MHS0230L030B	30.5	1.201	31.8	1.252	80.5	3.169	80	3.150	0.5	.020	3	.118	2
					21	★	MHS0230L055B	55.5	2.185	56.8	2.236	100.5	3.957	100	3.937	0.5	.020	3	.118	2
					30	★	MHS0230L075B	75.5	2.972	76.8	3.024	120.5	4.744	120	4.724	0.5	.020	3	.118	2
2.40	.0945				2	★	MHS0240L012B	12.4	.488	13.5	.531	60.4	2.378	60	2.362	0.4	.016	3	.118	1
					5	★	MHS0240L020B	20.5	.807	21.6	.850	60.5	2.382	60	2.362	0.5	.020	3	.118	2
					9	★	MHS0240L030B	30.5	1.201	31.6	1.244	80.5	3.169	80	3.150	0.5	.020	3	.118	2
					20	★	MHS0240L055B	55.5	2.185	56.6	2.228	100.5	3.957	100	3.937	0.5	.020	3	.118	2
					28	★	MHS0240L075B	75.5	2.972	76.6	3.016	120.5	4.744	120	4.724	0.5	.020	3	.118	2
2.45	.0965				2	★	MHS0245L013B	13.5	.531	14.5	.571	70.5	2.776	70	2.756	0.5	.020	4	.157	1
					5	★	MHS0245L020B	20.5	.807	21.5	.846	70.5	2.776	70	2.756	0.5	.020	4	.157	2
					11	★	MHS0245L035B	35.5	1.398	36.5	1.437	90.5	3.563	90	3.543	0.5	.020	4	.157	2
					24	★	MHS0245L065B	65.5	2.579	66.5	2.618	110.5	4.350	110	4.331	0.5	.020	4	.157	2
					30	★	MHS0245L090B	90.5	3.563	91.5	3.602	140.5	5.531	140	5.512	0.5	.020	4	.157	2
2.50	.0984				2	★	MHS0250L013B	13.5	.531	16.3	.642	70.5	2.776	70	2.756	0.5	.020	4	.157	1
					5	★	MHS0250L020B	20.5	.807	23.3	.917	70.5	2.776	70	2.756	0.5	.020	4	.157	2
					11	★	MHS0250L035B	35.5	1.398	38.3	1.508	90.5	3.563	90	3.543	0.5	.020	4	.157	2
					23	★	MHS0250L065B	65.5	2.579	68.3	2.689	110.5	4.350	110	4.331	0.5	.020	4	.157	2
					30	★	MHS0250L090B	90.5	3.563	93.3	3.673	140.5	5.531	140	5.512	0.5	.020	4	.157	2
2.60	.1024				2	★	MHS0260L013B	13.5	.531	16.1	.634	70.5	2.776	70	2.756	0.5	.020	4	.157	1
					5	★	MHS0260L020B	20.5	.807	23.1	.909	70.5	2.776	70	2.756	0.5	.020	4	.157	2
					10	★	MHS0260L035B	35.5	1.398	38.1	1.500	90.5	3.563	90	3.543	0.5	.020	4	.157	2
					22	★	MHS0260L065B	65.5	2.579	68.1	2.681	110.5	4.350	110	4.331	0.5	.020	4	.157	2
					30	★	MHS0260L090B	90.5	3.563	93.1	3.665	140.5	5.531	140	5.512	0.5	.020	4	.157	2
2.70	.1063		36	#6-32	2	★	MHS0270L013B	13.5	.531	15.9	.626	70.5	2.776	70	2.756	0.5	.020	4	.157	1
					4	★	MHS0270L020B	20.6	.811	23.0	.906	70.6	2.780	70	2.756	0.6	.024	4	.157	2
					10	★	MHS0270L035B	35.6	1.402	38.0	1.496	90.6	3.567	90	3.543	0.6	.024	4	.157	2
					21	★	MHS0270L065B	65.6	2.583	68.0	2.677	110.6	4.354	110	4.331	0.6	.024	4	.157	2
					30	★	MHS0270L090B	90.6	3.567	93.0	3.661	140.6	5.535	140	5.512	0.6	.024	4	.157	2
2.80	.1102		35		2	★	MHS0280L014B	14.5	.571	16.7	.657	70.5	2.776	70	2.756	0.5	.020	4	.157	1
					4	★	MHS0280L020B	20.6	.811	22.8	.898	70.6	2.780	70	2.756	0.6	.024	4	.157	2
					9	★	MHS0280L035B	35.6	1.402	37.8	1.488	90.6	3.567	90	3.543	0.6	.024	4	.157	2
					20	★	MHS0280L065B	65.6	2.583	67.8	2.669	110.6	4.354	110	4.331	0.6	.024	4	.157	2
					29	★	MHS0280L090B	90.6	3.567	92.8	3.654	140.6	5.535	140	5.512	0.6	.024	4	.157	2

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

Drill Diameter DC					Hole Depth	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d	VP15TF		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.90	.1142				2	★	MHS0290L014B	14.5	.571	16.6	.654	70.5	2.776	70	2.756	0.5	.020	4	.157	1
					4	★	MHS0290L020B	20.6	.811	22.7	.894	70.6	2.780	70	2.756	0.6	.024	4	.157	2
					9	★	MHS0290L035B	35.6	1.402	37.7	1.484	90.6	3.567	90	3.543	0.6	.024	4	.157	2
					19	★	MHS0290L065B	65.6	2.583	67.7	2.665	110.6	4.354	110	4.331	0.6	.024	4	.157	2
					28	★	MHS0290L090B	90.6	3.567	92.7	3.650	140.6	5.535	140	5.512	0.6	.024	4	.157	2
2.95	.1161		32		2	★	MHS0295L014B	14.5	.571	16.5	.650	70.5	2.776	70	2.756	0.5	.020	4	.157	1
					4	★	MHS0295L020B	20.6	.811	22.6	.890	70.6	2.780	70	2.756	0.6	.024	4	.157	2
					9	★	MHS0295L035B	35.6	1.402	37.6	1.480	90.6	3.567	90	3.543	0.6	.024	4	.157	2
					19	★	MHS0295L065B	65.6	2.583	67.6	2.661	110.6	4.354	110	4.331	0.6	.024	4	.157	2
					28	★	MHS0295L090B	90.6	3.567	92.6	3.646	140.6	5.535	140	5.512	0.6	.024	4	.157	2
3.0	.1181				4	★	MHS0300L020B	19.6	.772	20.6	.811	70.6	2.780	70	2.756	0.6	.024	4	.157	3
					10	★	MHS0300L040B	39.6	1.559	40.6	1.598	90.6	3.567	90	3.543	0.6	.024	4	.157	4
					17	★	MHS0300L060B	59.6	2.346	60.6	2.386	110.6	4.354	110	4.331	0.6	.024	4	.157	4
					27	★	MHS0300L090B	89.6	3.528	90.6	3.567	140.6	5.535	140	5.512	0.6	.024	4	.157	4
3.1	.1220				4	□	MHS0310L020B	20.1	.791	20.6	.811	70.6	2.780	70	2.756	0.6	.024	4	.157	3
					10	□	MHS0310L040B	40.1	1.579	40.6	1.598	90.6	3.567	90	3.543	0.6	.024	4	.157	4
					17	□	MHS0310L060B	60.1	2.366	60.6	2.386	110.6	4.354	110	4.331	0.6	.024	4	.157	4
					26	□	MHS0310L090B	90.1	3.547	90.6	3.567	140.6	5.535	140	5.512	0.6	.024	4	.157	4
3.2	.1260				4	□	MHS0320L020B	20.2	.795	20.7	.815	70.7	2.783	70	2.756	0.7	.028	4	.157	3
					10	□	MHS0320L040B	40.1	1.579	40.6	1.598	90.6	3.567	90	3.543	0.6	.024	4	.157	4
					16	□	MHS0320L060B	60.1	2.366	60.6	2.386	110.6	4.354	110	4.331	0.6	.024	4	.157	4
					25	□	MHS0320L090B	90.1	3.547	90.6	3.567	140.6	5.535	140	5.512	0.6	.024	4	.157	4
3.3	.1299			M4x0.7	3	□	MHS0330L020B	20.2	.795	20.7	.815	70.7	2.783	70	2.756	0.7	.028	4	.157	3
					9	□	MHS0330L040B	40.1	1.579	40.6	1.598	90.6	3.567	90	3.543	0.6	.024	4	.157	4
					16	□	MHS0330L060B	60.1	2.366	60.6	2.386	110.6	4.354	110	4.331	0.6	.024	4	.157	4
					25	□	MHS0330L090B	90.1	3.547	90.6	3.567	140.6	5.535	140	5.512	0.6	.024	4	.157	4
3.4	.1339				3	□	MHS0340L020B	20.2	.795	20.7	.815	70.7	2.783	70	2.756	0.7	.028	4	.157	3
					9	□	MHS0340L040B	40.1	1.579	40.6	1.598	90.6	3.567	90	3.543	0.6	.024	4	.157	4
					15	□	MHS0340L060B	60.1	2.366	60.6	2.386	110.6	4.354	110	4.331	0.6	.024	4	.157	4
					24	□	MHS0340L090B	90.1	3.547	90.6	3.567	140.6	5.535	140	5.512	0.6	.024	4	.157	4
3.5	.1378				3	★	MHS0350L020B	20.2	.795	20.7	.815	70.7	2.783	70	2.756	0.7	.028	4	.157	3
					9	★	MHS0350L040B	40.1	1.579	40.6	1.598	90.6	3.567	90	3.543	0.6	.024	4	.157	4
					14	★	MHS0350L060B	60.1	2.366	60.6	2.386	110.6	4.354	110	4.331	0.6	.024	4	.157	4
					23	★	MHS0350L090B	90.1	3.547	90.6	3.567	140.6	5.535	140	5.512	0.6	.024	4	.157	4
3.6	.1417				3	□	MHS0360L020B	20.8	.819	20.8	.819	70.8	2.787	70	2.756	0.8	.031	4	.157	3
					9	□	MHS0360L040B	40.7	1.602	40.7	1.602	90.7	3.571	90	3.543	0.7	.028	4	.157	4
					14	□	MHS0360L060B	60.7	2.390	60.7	2.390	110.7	4.358	110	4.331	0.7	.028	4	.157	4
					22	□	MHS0360L090B	90.7	3.571	90.7	3.571	140.7	5.539	140	5.512	0.7	.028	4	.157	4
					30	□	MHS0360L120B	120.7	4.752	120.7	4.752	170.7	6.720	170	6.693	0.7	.028	4	.157	4
3.7	.1457			M4.5x0.75	3	□	MHS0370L020B	20.8	.819	20.8	.819	70.8	2.787	70	2.756	0.8	.031	4	.157	3
					8	□	MHS0370L040B	40.7	1.602	40.7	1.602	90.7	3.571	90	3.543	0.7	.028	4	.157	4
					14	□	MHS0370L060B	60.7	2.390	60.7	2.390	110.7	4.358	110	4.331	0.7	.028	4	.157	4
					22	□	MHS0370L090B	90.7	3.571	90.7	3.571	140.7	5.539	140	5.512	0.7	.028	4	.157	4
					30	□	MHS0370L120B	120.7	4.752	120.7	4.752	170.7	6.720	170	6.693	0.7	.028	4	.157	4

CUTTING CONDITIONS ➤ L126
HOW TO USE ➤ L127
TECHNICAL DATA ➤ N001

MHS

Drill Diameter DC					Hole Depth	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d	VP15TF		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					3	★	MHS0380L020B	20.8	.819	20.8	.819	70.8	2.787	70	2.756	0.8	.031	4	.157	3
					8	★	MHS0380L040B	40.7	1.602	40.7	1.602	90.7	3.571	90	3.543	0.7	.028	4	.157	4
3.8	.1496		25	#10-24	13	★	MHS0380L060B	60.7	2.390	60.7	2.390	110.7	4.358	110	4.331	0.7	.028	4	.157	4
					21	★	MHS0380L090B	90.7	3.571	90.7	3.571	140.7	5.539	140	5.512	0.7	.028	4	.157	4
					29	★	MHS0380L120B	120.7	4.752	120.7	4.752	170.7	6.720	170	6.693	0.7	.028	4	.157	4
					3	□	MHS0390L020B	20.8	.819	20.8	.819	70.8	2.787	70	2.756	0.8	.031	4	.157	3
					8	□	MHS0390L040B	40.7	1.602	40.7	1.602	90.7	3.571	90	3.543	0.7	.028	4	.157	4
3.9	.1535				13	□	MHS0390L060B	60.7	2.390	60.7	2.390	110.7	4.358	110	4.331	0.7	.028	4	.157	4
					21	□	MHS0390L090B	90.7	3.571	90.7	3.571	140.7	5.539	140	5.512	0.7	.028	4	.157	4
					28	□	MHS0390L120B	120.7	4.752	120.7	4.752	170.7	6.720	170	6.693	0.7	.028	4	.157	4
					2	★	MHS0400L020B	20.8	.819	20.8	.819	70.8	2.787	70	2.756	0.8	.031	4	.157	3
					7	★	MHS0400L040B	40.7	1.602	40.7	1.602	90.7	3.571	90	3.543	0.7	.028	4	.157	4
4.0	.1575				12	★	MHS0400L060B	60.7	2.390	60.7	2.390	110.7	4.358	110	4.331	0.7	.028	4	.157	4
					20	★	MHS0400L090B	90.7	3.571	90.7	3.571	140.7	5.539	140	5.512	0.7	.028	4	.157	4
					27	★	MHS0400L120B	120.7	4.752	120.7	4.752	170.7	6.720	170	6.693	0.7	.028	4	.157	4
					2	□	MHS0410L020B	19.4	.764	20.9	.823	70.9	2.791	70	2.756	0.9	.035	6	.236	3
					7	□	MHS0410L040B	39.3	1.547	40.8	1.606	90.8	3.575	90	3.543	0.8	.031	6	.236	4
4.1	.1614				12	□	MHS0410L060B	59.3	2.335	60.8	2.394	110.8	4.362	110	4.331	0.8	.031	6	.236	4
					19	□	MHS0410L090B	89.3	3.516	90.8	3.575	140.8	5.543	140	5.512	0.8	.031	6	.236	4
					26	□	MHS0410L120B	119.3	4.697	120.8	4.756	170.8	6.724	170	6.693	0.8	.031	6	.236	4
					2	□	MHS0420L020B	19.4	.764	20.9	.823	70.9	2.791	70	2.756	0.9	.035	6	.236	3
					7	□	MHS0420L040B	39.3	1.547	40.8	1.606	90.8	3.575	90	3.543	0.8	.031	6	.236	4
4.2	.1654			M5x0.8	11	□	MHS0420L060B	59.3	2.335	60.8	2.394	110.8	4.362	110	4.331	0.8	.031	6	.236	4
					19	□	MHS0420L090B	89.3	3.516	90.8	3.575	140.8	5.543	140	5.512	0.8	.031	6	.236	4
					26	□	MHS0420L120B	119.3	4.697	120.8	4.756	170.8	6.724	170	6.693	0.8	.031	6	.236	4
					2	□	MHS0430L020B	19.4	.764	20.9	.823	70.9	2.791	70	2.756	0.9	.035	6	.236	3
					6	□	MHS0430L040B	39.3	1.547	40.8	1.606	90.8	3.575	90	3.543	0.8	.031	6	.236	4
4.3	.1693				11	□	MHS0430L060B	59.3	2.335	60.8	2.394	110.8	4.362	110	4.331	0.8	.031	6	.236	4
					18	□	MHS0430L090B	89.3	3.516	90.8	3.575	140.8	5.543	140	5.512	0.8	.031	6	.236	4
					25	□	MHS0430L120B	119.3	4.697	120.8	4.756	170.8	6.724	170	6.693	0.8	.031	6	.236	4
					2	□	MHS0440L020B	19.4	.764	20.9	.823	70.9	2.791	70	2.756	0.9	.035	6	.236	3
					6	□	MHS0440L040B	39.3	1.547	40.8	1.606	90.8	3.575	90	3.543	0.8	.031	6	.236	4
4.4	.1732		17		11	□	MHS0440L060B	59.3	2.335	60.8	2.394	110.8	4.362	110	4.331	0.8	.031	6	.236	4
					18	□	MHS0440L090B	89.3	3.516	90.8	3.575	140.8	5.543	140	5.512	0.8	.031	6	.236	4
					24	□	MHS0440L120B	119.3	4.697	120.8	4.756	170.8	6.724	170	6.693	0.8	.031	6	.236	4
					2	★	MHS0450L020B	19.4	.764	20.9	.823	70.9	2.791	70	2.756	0.9	.035	6	.236	3
					6	★	MHS0450L040B	39.3	1.547	40.8	1.606	90.8	3.575	90	3.543	0.8	.031	6	.236	4
4.5	.1772		16	#12-24	10	★	MHS0450L060B	59.3	2.335	60.8	2.394	110.8	4.362	110	4.331	0.8	.031	6	.236	4
					17	★	MHS0450L090B	89.3	3.516	90.8	3.575	140.8	5.543	140	5.512	0.8	.031	6	.236	4
					24	★	MHS0450L120B	119.3	4.697	120.8	4.756	170.8	6.724	170	6.693	0.8	.031	6	.236	4
					2	□	MHS0460L020B	20.0	.787	21.0	.827	71.0	2.795	70	2.756	1.0	.039	6	.236	3
					6	□	MHS0460L040B	39.8	1.567	40.8	1.606	90.8	3.575	90	3.543	0.8	.031	6	.236	4
4.6	.1811				10	□	MHS0460L060B	59.8	2.354	60.8	2.394	110.8	4.362	110	4.331	0.8	.031	6	.236	4
					17	□	MHS0460L090B	89.8	3.535	90.8	3.575	140.8	5.543	140	5.512	0.8	.031	6	.236	4
					23	□	MHS0460L120B	119.8	4.717	120.8	4.756	170.8	6.724	170	6.693	0.8	.031	6	.236	4
					30	□	MHS0460L150B	149.8	5.898	150.8	5.937	200.8	7.906	200	7.874	0.8	.031	6	.236	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

Drill Diameter DC					Hole Depth	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d	VP15TF		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.7	.1850		13		2	□	MHS0470L020B	20.0	.787	21.0	.827	71.0	2.795	70	2.756	1.0	.039	6	.236	3
					6	□	MHS0470L040B	39.9	1.571	40.9	1.610	90.9	3.579	90	3.543	0.9	.035	6	.236	4
					10	□	MHS0470L060B	59.9	2.358	60.9	2.398	110.9	4.366	110	4.331	0.9	.035	6	.236	4
					16	□	MHS0470L090B	89.9	3.539	90.9	3.579	140.9	5.547	140	5.512	0.9	.035	6	.236	4
					23	□	MHS0470L120B	119.9	4.720	120.9	4.760	170.9	6.728	170	6.693	0.9	.035	6	.236	4
					29	□	MHS0470L150B	149.9	5.902	150.9	5.941	200.9	7.909	200	7.874	0.9	.035	6	.236	4
4.8	.1890		12		1	★	MHS0480L020B	20.0	.787	21.0	.827	71.0	2.795	70	2.756	1.0	.039	6	.236	3
					6	★	MHS0480L040B	39.9	1.571	40.9	1.610	90.9	3.579	90	3.543	0.9	.035	6	.236	4
					10	★	MHS0480L060B	59.9	2.358	60.9	2.398	110.9	4.366	110	4.331	0.9	.035	6	.236	4
					16	★	MHS0480L090B	89.9	3.539	90.9	3.579	140.9	5.547	140	5.512	0.9	.035	6	.236	4
					22	★	MHS0480L120B	119.9	4.720	120.9	4.760	170.9	6.728	170	6.693	0.9	.035	6	.236	4
					29	★	MHS0480L150B	149.9	5.902	150.9	5.941	200.9	7.909	200	7.874	0.9	.035	6	.236	4
4.9	.1929				1	□	MHS0490L020B	20.0	.787	21.0	.827	71.0	2.795	70	2.756	1.0	.039	6	.236	3
					5	□	MHS0490L040B	39.9	1.571	40.9	1.610	90.9	3.579	90	3.543	0.9	.035	6	.236	4
					10	□	MHS0490L060B	59.9	2.358	60.9	2.398	110.9	4.366	110	4.331	0.9	.035	6	.236	4
					16	□	MHS0490L090B	89.9	3.539	90.9	3.579	140.9	5.547	140	5.512	0.9	.035	6	.236	4
					22	□	MHS0490L120B	119.9	4.720	120.9	4.760	170.9	6.728	170	6.693	0.9	.035	6	.236	4
					28	□	MHS0490L150B	149.9	5.902	150.9	5.941	200.9	7.909	200	7.874	0.9	.035	6	.236	4
5.0	.1969			M6x10	1	★	MHS0500L020B	20.0	.787	21.0	.827	71.0	2.795	70	2.756	1.0	.039	6	.236	3
					5	★	MHS0500L040B	39.9	1.571	40.9	1.610	90.9	3.579	90	3.543	0.9	.035	6	.236	4
					9	★	MHS0500L060B	59.9	2.358	60.9	2.398	110.9	4.366	110	4.331	0.9	.035	6	.236	4
					15	★	MHS0500L090B	89.9	3.539	90.9	3.579	140.9	5.547	140	5.512	0.9	.035	6	.236	4
					21	★	MHS0500L120B	119.9	4.720	120.9	4.760	170.9	6.728	170	6.693	0.9	.035	6	.236	4
					27	★	MHS0500L150B	149.9	5.902	150.9	5.941	200.9	7.909	200	7.874	0.9	.035	6	.236	4
5.1	.2008		7	1/4-20	3	□	MHS0510L030B	30.6	1.205	31.1	1.224	81.1	3.193	80	3.150	1.1	.043	6	.236	3
					9	□	MHS0510L060B	60.4	2.378	60.9	2.398	110.9	4.366	110	4.331	0.9	.035	6	.236	4
					15	□	MHS0510L090B	90.4	3.559	90.9	3.579	140.9	5.547	140	5.512	0.9	.035	6	.236	4
					21	□	MHS0510L120B	120.4	4.740	120.9	4.760	170.9	6.728	170	6.693	0.9	.035	6	.236	4
					27	□	MHS0510L150B	150.4	5.921	150.9	5.941	200.9	7.909	200	7.874	0.9	.035	6	.236	4
5.2	.2047				3	□	MHS0520L030B	30.6	1.205	31.1	1.224	81.1	3.193	80	3.150	1.1	.043	6	.236	3
					9	□	MHS0520L060B	60.5	2.382	61.0	2.402	111.0	4.370	110	4.331	1.0	.039	6	.236	4
					15	□	MHS0520L090B	90.5	3.563	91.0	3.583	141.0	5.551	140	5.512	1.0	.039	6	.236	4
					20	□	MHS0520L120B	120.5	4.744	121.0	4.764	171.0	6.732	170	6.693	1.0	.039	6	.236	4
					26	□	MHS0520L150B	150.5	5.925	151.0	5.945	201.0	7.913	200	7.874	1.0	.039	6	.236	4
5.3	.2087		4		3	□	MHS0530L030B	30.6	1.205	31.1	1.224	81.1	3.193	80	3.150	1.1	.043	6	.236	3
					9	□	MHS0530L060B	60.5	2.382	61.0	2.402	111.0	4.370	110	4.331	1.0	.039	6	.236	4
					14	□	MHS0530L090B	90.5	3.563	91.0	3.583	141.0	5.551	140	5.512	1.0	.039	6	.236	4
					20	□	MHS0530L120B	120.5	4.744	121.0	4.764	171.0	6.732	170	6.693	1.0	.039	6	.236	4
					26	□	MHS0530L150B	150.5	5.925	151.0	5.945	201.0	7.913	200	7.874	1.0	.039	6	.236	4
5.4	.2126		3		3	□	MHS0540L030B	30.6	1.205	31.1	1.224	81.1	3.193	80	3.150	1.1	.043	6	.236	3
					9	□	MHS0540L060B	60.5	2.382	61.0	2.402	111.0	4.370	110	4.331	1.0	.039	6	.236	4
					14	□	MHS0540L090B	90.5	3.563	91.0	3.583	141.0	5.551	140	5.512	1.0	.039	6	.236	4
					20	□	MHS0540L120B	120.5	4.744	121.0	4.764	171.0	6.732	170	6.693	1.0	.039	6	.236	4
					25	□	MHS0540L150B	150.5	5.925	151.0	5.945	201.0	7.913	200	7.874	1.0	.039	6	.236	4

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MHS

Drill Diameter DC					Hole Depth	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d	VP15TF		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					3	★	MHS0550L030B	30.6	1.205	31.1	1.224	81.1	3.193	80	3.150	1.1	.043	6	.236	3
					8	★	MHS0550L060B	60.5	2.382	61.0	2.402	111.0	4.370	110	4.331	1.0	.039	6	.236	4
5.5	.2165				14	★	MHS0550L090B	90.5	3.563	91.0	3.583	141.0	5.551	140	5.512	1.0	.039	6	.236	4
					19	★	MHS0550L120B	120.5	4.744	121.0	4.764	171.0	6.732	170	6.693	1.0	.039	6	.236	4
					25	★	MHS0550L150B	150.5	5.925	151.0	5.945	201.0	7.913	200	7.874	1.0	.039	6	.236	4
					3	□	MHS0560L030B	31.2	1.228	31.2	1.228	81.2	3.197	80	3.150	1.2	.047	6	.236	3
					8	□	MHS0560L060B	61.0	2.402	61.0	2.402	111.0	4.370	110	4.331	1.0	.039	6	.236	4
5.6	.2205		2		14	□	MHS0560L090B	91.0	3.583	91.0	3.583	141.0	5.551	140	5.512	1.0	.039	6	.236	4
					19	□	MHS0560L120B	121.0	4.764	121.0	4.764	171.0	6.732	170	6.693	1.0	.039	6	.236	4
					24	□	MHS0560L150B	151.0	5.945	151.0	5.945	201.0	7.913	200	7.874	1.0	.039	6	.236	4
					3	□	MHS0570L030B	31.2	1.228	31.2	1.228	81.2	3.197	80	3.150	1.2	.047	6	.236	3
					8	□	MHS0570L060B	61.0	2.402	61.0	2.402	111.0	4.370	110	4.331	1.0	.039	6	.236	4
5.7	.2244				13	□	MHS0570L090B	91.0	3.583	91.0	3.583	141.0	5.551	140	5.512	1.0	.039	6	.236	4
					19	□	MHS0570L120B	121.0	4.764	121.0	4.764	171.0	6.732	170	6.693	1.0	.039	6	.236	4
					24	□	MHS0570L150B	151.0	5.945	151.0	5.945	201.0	7.913	200	7.874	1.0	.039	6	.236	4
					3	★	MHS0580L030B	31.2	1.228	31.2	1.228	81.2	3.197	80	3.150	1.2	.047	6	.236	3
					8	★	MHS0580L060B	61.1	2.406	61.1	2.406	111.1	4.374	110	4.331	1.1	.043	6	.236	4
5.8	.2283		1		13	★	MHS0580L090B	91.1	3.587	91.1	3.587	141.1	5.555	140	5.512	1.1	.043	6	.236	4
					18	★	MHS0580L120B	121.1	4.768	121.1	4.768	171.1	6.736	170	6.693	1.1	.043	6	.236	4
					23	★	MHS0580L150B	151.1	5.949	151.1	5.949	201.1	7.917	200	7.874	1.1	.043	6	.236	4
					3	□	MHS0590L030B	31.2	1.228	31.2	1.228	81.2	3.197	80	3.150	1.2	.047	6	.236	3
					8	□	MHS0590L060B	61.1	2.406	61.1	2.406	111.1	4.374	110	4.331	1.1	.043	6	.236	4
5.9	.2323				13	□	MHS0590L090B	91.1	3.587	91.1	3.587	141.1	5.555	140	5.512	1.1	.043	6	.236	4
					18	□	MHS0590L120B	121.1	4.768	121.1	4.768	171.1	6.736	170	6.693	1.1	.043	6	.236	4
					23	□	MHS0590L150B	151.1	5.949	151.1	5.949	201.1	7.917	200	7.874	1.1	.043	6	.236	4
					2	★	MHS0600L030B	31.2	1.228	31.2	1.228	81.2	3.197	80	3.150	1.2	.047	6	.236	3
					7	★	MHS0600L060B	61.1	2.406	61.1	2.406	111.1	4.374	110	4.331	1.1	.043	6	.236	4
6.0	.2362			M7x1.0	12	★	MHS0600L090B	91.1	3.587	91.1	3.587	141.1	5.555	140	5.512	1.1	.043	6	.236	4
					17	★	MHS0600L120B	121.1	4.768	121.1	4.768	171.1	6.736	170	6.693	1.1	.043	6	.236	4
					22	★	MHS0600L150B	151.1	5.949	151.1	5.949	201.1	7.917	200	7.874	1.1	.043	6	.236	4
					2	□	MHS0610L030B	29.8	1.173	31.3	1.232	81.3	3.201	80	3.150	1.3	.051	8	.315	3
					7	□	MHS0610L060B	59.6	2.346	61.1	2.406	111.1	4.374	110	4.331	1.1	.043	8	.315	4
6.1	.2402				12	□	MHS0610L090B	89.6	3.528	91.1	3.587	141.1	5.555	140	5.512	1.1	.043	8	.315	4
					17	□	MHS0610L120B	119.6	4.709	121.1	4.768	171.1	6.736	170	6.693	1.1	.043	8	.315	4
					22	□	MHS0610L150B	149.6	5.890	151.1	5.949	201.1	7.917	200	7.874	1.1	.043	8	.315	4
					2	□	MHS0620L030B	29.8	1.173	31.3	1.232	81.3	3.201	80	3.150	1.3	.051	8	.315	3
					7	□	MHS0620L060B	59.6	2.346	61.1	2.406	111.1	4.374	110	4.331	1.1	.043	8	.315	4
6.2	.2441				12	□	MHS0620L090B	89.6	3.528	91.1	3.587	141.1	5.555	140	5.512	1.1	.043	8	.315	4
					17	□	MHS0620L120B	119.6	4.709	121.1	4.768	171.1	6.736	170	6.693	1.1	.043	8	.315	4
					21	□	MHS0620L150B	149.6	5.890	151.1	5.949	201.1	7.917	200	7.874	1.1	.043	8	.315	4
					2	□	MHS0630L030B	29.8	1.173	31.3	1.232	81.3	3.201	80	3.150	1.3	.051	8	.315	3
					7	□	MHS0630L060B	59.7	2.350	61.2	2.409	111.2	4.378	110	4.331	1.2	.047	8	.315	4
6.3	.2480				12	□	MHS0630L090B	89.7	3.531	91.2	3.591	141.2	5.559	140	5.512	1.2	.047	8	.315	4
					16	□	MHS0630L120B	119.7	4.713	121.2	4.772	171.2	6.740	170	6.693	1.2	.047	8	.315	4
					21	□	MHS0630L150B	149.7	5.894	151.2	5.953	201.2	7.921	200	7.874	1.2	.047	8	.315	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

Drill Diameter DC					Hole Depth	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d	VP15TF		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
6.4	.2520				2	□	MHS0640L030B	29.8	1.173	31.3	1.232	81.3	3.201	80	3.150	1.3	.051	8	.315	3
					7	□	MHS0640L060B	59.7	2.350	61.2	2.409	111.2	4.378	110	4.331	1.2	.047	8	.315	4
					11	□	MHS0640L090B	89.7	3.531	91.2	3.591	141.2	5.559	140	5.512	1.2	.047	8	.315	4
					16	□	MHS0640L120B	119.7	4.713	121.2	4.772	171.2	6.740	170	6.693	1.2	.047	8	.315	4
					21	□	MHS0640L150B	149.7	5.894	151.2	5.953	201.2	7.921	200	7.874	1.2	.047	8	.315	4
6.5	.2559				2	★	MHS0650L030B	29.9	1.177	31.4	1.236	81.4	3.205	80	3.150	1.4	.055	8	.315	3
					6	★	MHS0650L060B	59.7	2.350	61.2	2.409	111.2	4.378	110	4.331	1.2	.047	8	.315	4
					11	★	MHS0650L090B	89.7	3.531	91.2	3.591	141.2	5.559	140	5.512	1.2	.047	8	.315	4
					16	★	MHS0650L120B	119.7	4.713	121.2	4.772	171.2	6.740	170	6.693	1.2	.047	8	.315	4
					20	★	MHS0650L150B	149.7	5.894	151.2	5.953	201.2	7.921	200	7.874	1.2	.047	8	.315	4
6.6	.2598				2	□	MHS0660L030B	30.4	1.197	31.4	1.236	81.4	3.205	80	3.150	1.4	.055	8	.315	3
					6	□	MHS0660L060B	60.2	2.370	61.2	2.409	111.2	4.378	110	4.331	1.2	.047	8	.315	4
					11	□	MHS0660L090B	90.2	3.551	91.2	3.591	141.2	5.559	140	5.512	1.2	.047	8	.315	4
					16	□	MHS0660L120B	120.2	4.732	121.2	4.772	171.2	6.740	170	6.693	1.2	.047	8	.315	4
					20	□	MHS0660L150B	150.2	5.913	151.2	5.953	201.2	7.921	200	7.874	1.2	.047	8	.315	4
					28	□	MHS0660L200B	200.2	7.882	201.2	7.921	251.2	9.890	250	9.843	1.2	.047	8	.315	4
6.7	.2638			M8x1.25	2	□	MHS0670L030B	30.4	1.197	31.4	1.236	81.4	3.205	80	3.150	1.4	.055	8	.315	3
					6	□	MHS0670L060B	60.2	2.370	61.2	2.409	111.2	4.378	110	4.331	1.2	.047	8	.315	4
					11	□	MHS0670L090B	90.2	3.551	91.2	3.591	141.2	5.559	140	5.512	1.2	.047	8	.315	4
					15	□	MHS0670L120B	120.2	4.732	121.2	4.772	171.2	6.740	170	6.693	1.2	.047	8	.315	4
					20	□	MHS0670L150B	150.2	5.913	151.2	5.953	201.2	7.921	200	7.874	1.2	.047	8	.315	4
					27	□	MHS0670L200B	200.2	7.882	201.2	7.921	251.2	9.890	250	9.843	1.2	.047	8	.315	4
6.8	.2677				2	★	MHS0680L030B	30.4	1.197	31.4	1.236	81.4	3.205	80	3.150	1.4	.055	8	.315	3
					6	★	MHS0680L060B	60.2	2.370	61.2	2.409	111.2	4.378	110	4.331	1.2	.047	8	.315	4
					11	★	MHS0680L090B	90.2	3.551	91.2	3.591	141.2	5.559	140	5.512	1.2	.047	8	.315	4
					15	★	MHS0680L120B	120.2	4.732	121.2	4.772	171.2	6.740	170	6.693	1.2	.047	8	.315	4
					19	★	MHS0680L150B	150.2	5.913	151.2	5.953	201.2	7.921	200	7.874	1.2	.047	8	.315	4
					27	★	MHS0680L200B	200.2	7.882	201.2	7.921	251.2	9.890	250	9.843	1.2	.047	8	.315	4
6.9	.2717		I	5/16-24	2	□	MHS0690L030B	30.4	1.197	31.4	1.236	81.4	3.205	80	3.150	1.4	.055	8	.315	3
					6	□	MHS0690L060B	60.3	2.374	61.3	2.413	111.3	4.382	110	4.331	1.3	.051	8	.315	4
					10	□	MHS0690L090B	90.3	3.555	91.3	3.594	141.3	5.563	140	5.512	1.3	.051	8	.315	4
					15	□	MHS0690L120B	120.3	4.736	121.3	4.776	171.3	6.744	170	6.693	1.3	.051	8	.315	4
					19	□	MHS0690L150B	150.3	5.917	151.3	5.957	201.3	7.925	200	7.874	1.3	.051	8	.315	4
					26	□	MHS0690L200B	200.3	7.886	201.3	7.925	251.3	9.894	250	9.843	1.3	.051	8	.315	4
7.0	.2756			M8x1.0	2	★	MHS0700L030B	30.5	1.201	31.5	1.240	81.5	3.209	80	3.150	1.5	.059	8	.315	3
					6	★	MHS0700L060B	60.3	2.374	61.3	2.413	111.3	4.382	110	4.331	1.3	.051	8	.315	4
					10	★	MHS0700L090B	90.3	3.555	91.3	3.594	141.3	5.563	140	5.512	1.3	.051	8	.315	4
					14	★	MHS0700L120B	120.3	4.736	121.3	4.776	171.3	6.744	170	6.693	1.3	.051	8	.315	4
					19	★	MHS0700L150B	150.3	5.917	151.3	5.957	201.3	7.925	200	7.874	1.3	.051	8	.315	4
					26	★	MHS0700L200B	200.3	7.886	201.3	7.925	251.3	9.894	250	9.843	1.3	.051	8	.315	4
7.1	.2795				2	□	MHS0710L030B	31.0	1.220	31.5	1.240	81.5	3.209	80	3.150	1.5	.059	8	.315	3
					6	□	MHS0710L060B	60.8	2.394	61.3	2.413	111.3	4.382	110	4.331	1.3	.051	8	.315	4
					10	□	MHS0710L090B	90.8	3.575	91.3	3.594	141.3	5.563	140	5.512	1.3	.051	8	.315	4
					14	□	MHS0710L120B	120.8	4.756	121.3	4.776	171.3	6.744	170	6.693	1.3	.051	8	.315	4
					19	□	MHS0710L150B	150.8	5.937	151.3	5.957	201.3	7.925	200	7.874	1.3	.051	8	.315	4
					26	□	MHS0710L200B	200.8	7.906	201.3	7.925	251.3	9.894	250	9.843	1.3	.051	8	.315	4

CUTTING CONDITIONS ➤ L126
HOW TO USE ➤ L127
TECHNICAL DATA ➤ N001

MHS

Drill Diameter DC					Hole Depth	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d	VP15TF		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
7.2	.2835				2	□	MHS0720L030B	31.0	1.220	31.5	1.240	81.5	3.209	80	3.150	1.5	.059	8	.315	3
					6	□	MHS0720L060B	60.8	2.394	61.3	2.413	111.3	4.382	110	4.331	1.3	.051	8	.315	4
					10	□	MHS0720L090B	90.8	3.575	91.3	3.594	141.3	5.563	140	5.512	1.3	.051	8	.315	4
					14	□	MHS0720L120B	120.8	4.756	121.3	4.776	171.3	6.744	170	6.693	1.3	.051	8	.315	4
					18	□	MHS0720L150B	150.8	5.937	151.3	5.957	201.3	7.925	200	7.874	1.3	.051	8	.315	4
					25	□	MHS0720L200B	200.8	7.906	201.3	7.925	251.3	9.894	250	9.843	1.3	.051	8	.315	4
7.3	.2874				2	□	MHS0730L030B	31.0	1.220	31.5	1.240	81.5	3.209	80	3.150	1.5	.059	8	.315	3
					6	□	MHS0730L060B	60.8	2.394	61.3	2.413	111.3	4.382	110	4.331	1.3	.051	8	.315	4
					10	□	MHS0730L090B	90.8	3.575	91.3	3.594	141.3	5.563	140	5.512	1.3	.051	8	.315	4
					14	□	MHS0730L120B	120.8	4.756	121.3	4.776	171.3	6.744	170	6.693	1.3	.051	8	.315	4
					18	□	MHS0730L150B	150.8	5.937	151.3	5.957	201.3	7.925	200	7.874	1.3	.051	8	.315	4
					25	□	MHS0730L200B	200.8	7.906	201.3	7.925	251.3	9.894	250	9.843	1.3	.051	8	.315	4
7.4	.2913				1	□	MHS0740L030B	31.0	1.220	31.5	1.240	81.5	3.209	80	3.150	1.5	.059	8	.315	3
					6	□	MHS0740L060B	60.9	2.398	61.4	2.417	111.4	4.386	110	4.331	1.4	.055	8	.315	4
					10	□	MHS0740L090B	90.9	3.579	91.4	3.598	141.4	5.567	140	5.512	1.4	.055	8	.315	4
					14	□	MHS0740L120B	120.9	4.760	121.4	4.780	171.4	6.748	170	6.693	1.4	.055	8	.315	4
					18	□	MHS0740L150B	150.9	5.941	151.4	5.961	201.4	7.929	200	7.874	1.4	.055	8	.315	4
					24	□	MHS0740L200B	200.9	7.909	201.4	7.929	251.4	9.898	250	9.843	1.4	.055	8	.315	4
7.5	.2953		M		1	★	MHS0750L030B	31.1	1.224	31.6	1.244	81.6	3.213	80	3.150	1.6	.063	8	.315	3
					5	★	MHS0750L060B	60.9	2.398	61.4	2.417	111.4	4.386	110	4.331	1.4	.055	8	.315	4
					9	★	MHS0750L090B	90.9	3.579	91.4	3.598	141.4	5.567	140	5.512	1.4	.055	8	.315	4
					13	★	MHS0750L120B	120.9	4.760	121.4	4.780	171.4	6.748	170	6.693	1.4	.055	8	.315	4
					17	★	MHS0750L150B	150.9	5.941	151.4	5.961	201.4	7.929	200	7.874	1.4	.055	8	.315	4
					24	★	MHS0750L200B	200.9	7.909	201.4	7.929	251.4	9.898	250	9.843	1.4	.055	8	.315	4
7.6	.2992				1	□	MHS0760L030B	31.6	1.244	31.6	1.244	81.6	3.213	80	3.150	1.6	.063	8	.315	3
					5	□	MHS0760L060B	61.4	2.417	61.4	2.417	111.4	4.386	110	4.331	1.4	.055	8	.315	4
					9	□	MHS0760L090B	91.4	3.598	91.4	3.598	141.4	5.567	140	5.512	1.4	.055	8	.315	4
					13	□	MHS0760L120B	121.4	4.780	121.4	4.780	171.4	6.748	170	6.693	1.4	.055	8	.315	4
					17	□	MHS0760L150B	151.4	5.961	151.4	5.961	201.4	7.929	200	7.874	1.4	.055	8	.315	4
					24	□	MHS0760L200B	201.4	7.929	201.4	7.929	251.4	9.898	250	9.843	1.4	.055	8	.315	4
					30	□	MHS0760L250B	251.4	9.898	251.4	9.898	301.4	11.866	300	11.811	1.4	.055	8	.315	4
7.7	.3031				1	□	MHS0770L030B	31.6	1.244	31.6	1.244	81.6	3.213	80	3.150	1.6	.063	8	.315	3
					5	□	MHS0770L060B	61.4	2.417	61.4	2.417	111.4	4.386	110	4.331	1.4	.055	8	.315	4
					9	□	MHS0770L090B	91.4	3.598	91.4	3.598	141.4	5.567	140	5.512	1.4	.055	8	.315	4
					13	□	MHS0770L120B	121.4	4.780	121.4	4.780	171.4	6.748	170	6.693	1.4	.055	8	.315	4
					17	□	MHS0770L150B	151.4	5.961	151.4	5.961	201.4	7.929	200	7.874	1.4	.055	8	.315	4
					23	□	MHS0770L200B	201.4	7.929	201.4	7.929	251.4	9.898	250	9.843	1.4	.055	8	.315	4
					30	□	MHS0770L250B	251.4	9.898	251.4	9.898	301.4	11.866	300	11.811	1.4	.055	8	.315	4
7.8	.3071				1	★	MHS0780L030B	31.6	1.244	31.6	1.244	81.6	3.213	80	3.150	1.6	.063	8	.315	3
					5	★	MHS0780L060B	61.4	2.417	61.4	2.417	111.4	4.386	110	4.331	1.4	.055	8	.315	4
					9	★	MHS0780L090B	91.4	3.598	91.4	3.598	141.4	5.567	140	5.512	1.4	.055	8	.315	4
					13	★	MHS0780L120B	121.4	4.780	121.4	4.780	171.4	6.748	170	6.693	1.4	.055	8	.315	4
					17	★	MHS0780L150B	151.4	5.961	151.4	5.961	201.4	7.929	200	7.874	1.4	.055	8	.315	4
					23	★	MHS0780L200B	201.4	7.929	201.4	7.929	251.4	9.898	250	9.843	1.4	.055	8	.315	4
					30	★	MHS0780L250B	251.4	9.898	251.4	9.898	301.4	11.866	300	11.811	1.4	.055	8	.315	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

Drill Diameter DC					Hole Depth	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d	VP15TF		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
7.9	.3110				1	□	MHS0790L030B	31.6	1.244	31.6	1.244	81.6	3.213	80	3.150	1.6	.063	8	.315	3
					5	□	MHS0790L060B	61.4	2.417	61.4	2.417	111.4	4.386	110	4.331	1.4	.055	8	.315	4
					9	□	MHS0790L090B	91.4	3.598	91.4	3.598	141.4	5.567	140	5.512	1.4	.055	8	.315	4
					13	□	MHS0790L120B	121.4	4.780	121.4	4.780	171.4	6.748	170	6.693	1.4	.055	8	.315	4
					16	□	MHS0790L150B	151.4	5.961	151.4	5.961	201.4	7.929	200	7.874	1.4	.055	8	.315	4
					23	□	MHS0790L200B	201.4	7.929	201.4	7.929	251.4	9.898	250	9.843	1.4	.055	8	.315	4
					29	□	MHS0790L250B	251.4	9.898	251.4	9.898	301.4	11.866	300	11.811	1.4	.055	8	.315	4
8.0	.3150				1	★	MHS0800L030B	31.7	1.248	31.7	1.248	81.7	3.217	80	3.150	1.7	.067	8	.315	3
					5	★	MHS0800L060B	61.5	2.421	61.5	2.421	111.5	4.390	110	4.331	1.5	.059	8	.315	4
					9	★	MHS0800L090B	91.5	3.602	91.5	3.602	141.5	5.571	140	5.512	1.5	.059	8	.315	4
					12	★	MHS0800L120B	121.5	4.783	121.5	4.783	171.5	6.752	170	6.693	1.5	.059	8	.315	4
					16	★	MHS0800L150B	151.5	5.965	151.5	5.965	201.5	7.933	200	7.874	1.5	.059	8	.315	4
					22	★	MHS0800L200B	201.5	7.933	201.5	7.933	251.5	9.902	250	9.843	1.5	.059	8	.315	4
					29	★	MHS0800L250B	251.5	9.902	251.5	9.902	301.5	11.870	300	11.811	1.5	.059	8	.315	4
8.1	.3189				2	□	MHS0810L040B	40.2	1.583	41.7	1.642	101.7	4.004	100	3.937	1.7	.067	10	.394	3
					8	□	MHS0810L090B	90.0	3.543	91.5	3.602	151.5	5.965	150	5.906	1.5	.059	10	.394	4
					12	□	MHS0810L120B	120.0	4.724	121.5	4.783	181.5	7.146	180	7.087	1.5	.059	10	.394	4
					16	□	MHS0810L150B	150.0	5.906	151.5	5.965	211.5	8.327	210	8.268	1.5	.059	10	.394	4
					22	□	MHS0810L200B	200.0	7.874	201.5	7.933	261.5	10.295	260	10.236	1.5	.059	10	.394	4
					28	□	MHS0810L250B	250.0	9.843	251.5	9.902	311.5	12.264	310	12.205	1.5	.059	10	.394	4
8.2	.3228		P		2	□	MHS0820L040B	40.2	1.583	41.7	1.642	101.7	4.004	100	3.937	1.7	.067	10	.394	3
					8	□	MHS0820L090B	90.0	3.543	91.5	3.602	151.5	5.965	150	5.906	1.5	.059	10	.394	4
					12	□	MHS0820L120B	120.0	4.724	121.5	4.783	181.5	7.146	180	7.087	1.5	.059	10	.394	4
					16	□	MHS0820L150B	150.0	5.906	151.5	5.965	211.5	8.327	210	8.268	1.5	.059	10	.394	4
					22	□	MHS0820L200B	200.0	7.874	201.5	7.933	261.5	10.295	260	10.236	1.5	.059	10	.394	4
					28	□	MHS0820L250B	250.0	9.843	251.5	9.902	311.5	12.264	310	12.205	1.5	.059	10	.394	4
8.3	.3268				2	□	MHS0830L040B	40.2	1.583	41.7	1.642	101.7	4.004	100	3.937	1.7	.067	10	.394	3
					8	□	MHS0830L090B	90.0	3.543	91.5	3.602	151.5	5.965	150	5.906	1.5	.059	10	.394	4
					12	□	MHS0830L120B	120.0	4.724	121.5	4.783	181.5	7.146	180	7.087	1.5	.059	10	.394	4
					15	□	MHS0830L150B	150.0	5.906	151.5	5.965	211.5	8.327	210	8.268	1.5	.059	10	.394	4
					21	□	MHS0830L200B	200.0	7.874	201.5	7.933	261.5	10.295	260	10.236	1.5	.059	10	.394	4
					27	□	MHS0830L250B	250.0	9.843	251.5	9.902	311.5	12.264	310	12.205	1.5	.059	10	.394	4
8.4	.3307				2	□	MHS0840L040B	40.2	1.583	41.7	1.642	101.7	4.004	100	3.937	1.7	.067	10	.394	3
					8	□	MHS0840L090B	90.0	3.543	91.5	3.602	151.5	5.965	150	5.906	1.5	.059	10	.394	4
					12	□	MHS0840L120B	120.0	4.724	121.5	4.783	181.5	7.146	180	7.087	1.5	.059	10	.394	4
					15	□	MHS0840L150B	150.0	5.906	151.5	5.965	211.5	8.327	210	8.268	1.5	.059	10	.394	4
					21	□	MHS0840L200B	200.0	7.874	201.5	7.933	261.5	10.295	260	10.236	1.5	.059	10	.394	4
					27	□	MHS0840L250B	250.0	9.843	251.5	9.902	311.5	12.264	310	12.205	1.5	.059	10	.394	4
8.5	.3346			M10x1.5	2	★	MHS0850L040B	40.3	1.587	41.8	1.646	101.8	4.008	100	3.937	1.8	.071	10	.394	3
					8	★	MHS0850L090B	90.1	3.547	91.6	3.606	151.6	5.969	150	5.906	1.6	.063	10	.394	4
					11	★	MHS0850L120B	120.1	4.728	121.6	4.787	181.6	7.150	180	7.087	1.6	.063	10	.394	4
					15	★	MHS0850L150B	150.1	5.909	151.6	5.969	211.6	8.331	210	8.268	1.6	.063	10	.394	4
					21	★	MHS0850L200B	200.1	7.878	201.6	7.937	261.6	10.299	260	10.236	1.6	.063	10	.394	4
					27	★	MHS0850L250B	250.1	9.846	251.6	9.906	311.6	12.268	310	12.205	1.6	.063	10	.394	4

CUTTING CONDITIONS ➤ L126
HOW TO USE ➤ L127
TECHNICAL DATA ➤ N001

MHS

Drill Diameter DC					Hole Depth	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d	VP15TF		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
8.6	.3386		R		2	□	MHS0860L040B	40.8	1.606	41.8	1.646	101.8	4.008	100	3.937	1.8	.071	10	.394	3
					8	□	MHS0860L090B	90.6	3.567	91.6	3.606	151.6	5.969	150	5.906	1.6	.063	10	.394	4
					11	□	MHS0860L120B	120.6	4.748	121.6	4.787	181.6	7.150	180	7.087	1.6	.063	10	.394	4
					15	□	MHS0860L150B	150.6	5.929	151.6	5.969	211.6	8.331	210	8.268	1.6	.063	10	.394	4
					21	□	MHS0860L200B	200.6	7.898	201.6	7.937	261.6	10.299	260	10.236	1.6	.063	10	.394	4
					26	□	MHS0860L250B	250.6	9.866	251.6	9.906	311.6	12.268	310	12.205	1.6	.063	10	.394	4
8.7	.3425			M10x1.25	2	□	MHS0870L040B	40.8	1.606	41.8	1.646	101.8	4.008	100	3.937	1.8	.071	10	.394	3
					8	□	MHS0870L090B	90.6	3.567	91.6	3.606	151.6	5.969	150	5.906	1.6	.063	10	.394	4
					11	□	MHS0870L120B	120.6	4.748	121.6	4.787	181.6	7.150	180	7.087	1.6	.063	10	.394	4
					15	□	MHS0870L150B	150.6	5.929	151.6	5.969	211.6	8.331	210	8.268	1.6	.063	10	.394	4
					20	□	MHS0870L200B	200.6	7.898	201.6	7.937	261.6	10.299	260	10.236	1.6	.063	10	.394	4
					26	□	MHS0870L250B	250.6	9.866	251.6	9.906	311.6	12.268	310	12.205	1.6	.063	10	.394	4
8.8	.3465				2	★	MHS0880L040B	40.8	1.606	41.8	1.646	101.8	4.008	100	3.937	1.8	.071	10	.394	3
					8	★	MHS0880L090B	90.6	3.567	91.6	3.606	151.6	5.969	150	5.906	1.6	.063	10	.394	4
					11	★	MHS0880L120B	120.6	4.748	121.6	4.787	181.6	7.150	180	7.087	1.6	.063	10	.394	4
					14	★	MHS0880L150B	150.6	5.929	151.6	5.969	211.6	8.331	210	8.268	1.6	.063	10	.394	4
					20	★	MHS0880L200B	200.6	7.898	201.6	7.937	261.6	10.299	260	10.236	1.6	.063	10	.394	4
					26	★	MHS0880L250B	250.6	9.866	251.6	9.906	311.6	12.268	310	12.205	1.6	.063	10	.394	4
8.9	.3504				2	□	MHS0890L040B	40.8	1.606	41.8	1.646	101.8	4.008	100	3.937	1.8	.071	10	.394	3
					7	□	MHS0890L090B	90.6	3.567	91.6	3.606	151.6	5.969	150	5.906	1.6	.063	10	.394	4
					11	□	MHS0890L120B	120.6	4.748	121.6	4.787	181.6	7.150	180	7.087	1.6	.063	10	.394	4
					14	□	MHS0890L150B	150.6	5.929	151.6	5.969	211.6	8.331	210	8.268	1.6	.063	10	.394	4
					20	□	MHS0890L200B	200.6	7.898	201.6	7.937	261.6	10.299	260	10.236	1.6	.063	10	.394	4
					25	□	MHS0890L250B	250.6	9.866	251.6	9.906	311.6	12.268	310	12.205	1.6	.063	10	.394	4
9.0	.3543				2	★	MHS0900L040B	40.9	1.610	41.9	1.650	101.9	4.012	100	3.937	1.9	.075	10	.394	3
					7	★	MHS0900L090B	90.6	3.567	91.6	3.606	151.6	5.969	150	5.906	1.6	.063	10	.394	4
					11	★	MHS0900L120B	120.6	4.748	121.6	4.787	181.6	7.150	180	7.087	1.6	.063	10	.394	4
					14	★	MHS0900L150B	150.6	5.929	151.6	5.969	211.6	8.331	210	8.268	1.6	.063	10	.394	4
					20	★	MHS0900L200B	200.6	7.898	201.6	7.937	261.6	10.299	260	10.236	1.6	.063	10	.394	4
					25	★	MHS0900L250B	250.6	9.866	251.6	9.906	311.6	12.268	310	12.205	1.6	.063	10	.394	4
9.1	.3583		T		2	□	MHS0910L040B	41.4	1.630	41.9	1.650	101.9	4.012	100	3.937	1.9	.075	10	.394	3
					7	□	MHS0910L090B	91.2	3.591	91.7	3.610	151.7	5.972	150	5.906	1.7	.067	10	.394	4
					11	□	MHS0910L120B	121.2	4.772	121.7	4.791	181.7	7.154	180	7.087	1.7	.067	10	.394	4
					14	□	MHS0910L150B	151.2	5.953	151.7	5.972	211.7	8.335	210	8.268	1.7	.067	10	.394	4
					19	□	MHS0910L200B	201.2	7.921	201.7	7.941	261.7	10.303	260	10.236	1.7	.067	10	.394	4
					25	□	MHS0910L250B	251.2	9.890	251.7	9.909	311.7	12.272	310	12.205	1.7	.067	10	.394	4
					30	□	MHS0910L300B	301.2	11.858	301.7	11.878	361.7	14.240	360	14.173	1.7	.067	10	.394	4
9.2	.3622				2	□	MHS0920L040B	41.4	1.630	41.9	1.650	101.9	4.012	100	3.937	1.9	.075	10	.394	3
					7	□	MHS0920L090B	91.2	3.591	91.7	3.610	151.7	5.972	150	5.906	1.7	.067	10	.394	4
					10	□	MHS0920L120B	121.2	4.772	121.7	4.791	181.7	7.154	180	7.087	1.7	.067	10	.394	4
					14	□	MHS0920L150B	151.2	5.953	151.7	5.972	211.7	8.335	210	8.268	1.7	.067	10	.394	4
					19	□	MHS0920L200B	201.2	7.921	201.7	7.941	261.7	10.303	260	10.236	1.7	.067	10	.394	4
					25	□	MHS0920L250B	251.2	9.890	251.7	9.909	311.7	12.272	310	12.205	1.7	.067	10	.394	4
					30	□	MHS0920L300B	301.2	11.858	301.7	11.878	361.7	14.240	360	14.173	1.7	.067	10	.394	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

Drill Diameter DC					Hole Depth	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d	VP15TF		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
9.3	.3661				2	□	MHS0930L040B	41.4	1.630	41.9	1.650	101.9	4.012	100	3.937	1.9	.075	10	.394	3
					7	□	MHS0930L090B	91.2	3.591	91.7	3.610	151.7	5.972	150	5.906	1.7	.067	10	.394	4
					10	□	MHS0930L120B	121.2	4.772	121.7	4.791	181.7	7.154	180	7.087	1.7	.067	10	.394	4
					14	□	MHS0930L150B	151.2	5.953	151.7	5.972	211.7	8.335	210	8.268	1.7	.067	10	.394	4
					19	□	MHS0930L200B	201.2	7.921	201.7	7.941	261.7	10.303	260	10.236	1.7	.067	10	.394	4
					24	□	MHS0930L250B	251.2	9.890	251.7	9.909	311.7	12.272	310	12.205	1.7	.067	10	.394	4
					30	□	MHS0930L300B	301.2	11.858	301.7	11.878	361.7	14.240	360	14.173	1.7	.067	10	.394	4
9.4	.3701				2	□	MHS0940L040B	41.5	1.634	42.0	1.654	102.0	4.016	100	3.937	2.0	.079	10	.394	3
					7	□	MHS0940L090B	91.2	3.591	91.7	3.610	151.7	5.972	150	5.906	1.7	.067	10	.394	4
					10	□	MHS0940L120B	121.2	4.772	121.7	4.791	181.7	7.154	180	7.087	1.7	.067	10	.394	4
					13	□	MHS0940L150B	151.2	5.953	151.7	5.972	211.7	8.335	210	8.268	1.7	.067	10	.394	4
					19	□	MHS0940L200B	201.2	7.921	201.7	7.941	261.7	10.303	260	10.236	1.7	.067	10	.394	4
					24	□	MHS0940L250B	251.2	9.890	251.7	9.909	311.7	12.272	310	12.205	1.7	.067	10	.394	4
					29	□	MHS0940L300B	301.2	11.858	301.7	11.878	361.7	14.240	360	14.173	1.7	.067	10	.394	4
9.5	.3740				2	★	MHS0950L040B	41.5	1.634	42.0	1.654	102.0	4.016	100	3.937	2.0	.079	10	.394	3
					7	★	MHS0950L090B	91.2	3.591	91.7	3.610	151.7	5.972	150	5.906	1.7	.067	10	.394	4
					10	★	MHS0950L120B	121.2	4.772	121.7	4.791	181.7	7.154	180	7.087	1.7	.067	10	.394	4
					13	★	MHS0950L150B	151.2	5.953	151.7	5.972	211.7	8.335	210	8.268	1.7	.067	10	.394	4
					18	★	MHS0950L200B	201.2	7.921	201.7	7.941	261.7	10.303	260	10.236	1.7	.067	10	.394	4
					24	★	MHS0950L250B	251.2	9.890	251.7	9.909	311.7	12.272	310	12.205	1.7	.067	10	.394	4
					29	★	MHS0950L300B	301.2	11.858	301.7	11.878	361.7	14.240	360	14.173	1.7	.067	10	.394	4
9.6	.3780				2	□	MHS0960L040B	42.0	1.654	42.0	1.654	102.0	4.016	100	3.937	2.0	.079	10	.394	3
					7	□	MHS0960L090B	91.8	3.614	91.8	3.614	151.8	5.976	150	5.906	1.8	.071	10	.394	4
					10	□	MHS0960L120B	121.8	4.795	121.8	4.795	181.8	7.157	180	7.087	1.8	.071	10	.394	4
					13	□	MHS0960L150B	151.8	5.976	151.8	5.976	211.8	8.339	210	8.268	1.8	.071	10	.394	4
					18	□	MHS0960L200B	201.8	7.945	201.8	7.945	261.8	10.307	260	10.236	1.8	.071	10	.394	4
					24	□	MHS0960L250B	251.8	9.913	251.8	9.913	311.8	12.276	310	12.205	1.8	.071	10	.394	4
					29	□	MHS0960L300B	301.8	11.882	301.8	11.882	361.8	14.244	360	14.173	1.8	.071	10	.394	4
9.7	.3819		Tube Sheet		2	□	MHS0970L040B	42.0	1.654	42.0	1.654	102.0	4.016	100	3.937	2.0	.079	10	.394	3
					7	□	MHS0970L090B	91.8	3.614	91.8	3.614	151.8	5.976	150	5.906	1.8	.071	10	.394	4
					10	□	MHS0970L120B	121.8	4.795	121.8	4.795	181.8	7.157	180	7.087	1.8	.071	10	.394	4
					13	□	MHS0970L150B	151.8	5.976	151.8	5.976	211.8	8.339	210	8.268	1.8	.071	10	.394	4
					18	□	MHS0970L200B	201.8	7.945	201.8	7.945	261.8	10.307	260	10.236	1.8	.071	10	.394	4
					23	□	MHS0970L250B	251.8	9.913	251.8	9.913	311.8	12.276	310	12.205	1.8	.071	10	.394	4
					28	□	MHS0970L300B	301.8	11.882	301.8	11.882	361.8	14.244	360	14.173	1.8	.071	10	.394	4
9.8	.3858		W		2	★	MHS0980L040B	42.0	1.654	42.0	1.654	102.0	4.016	100	3.937	2.0	.079	10	.394	3
					7	★	MHS0980L090B	91.8	3.614	91.8	3.614	151.8	5.976	150	5.906	1.8	.071	10	.394	4
					10	★	MHS0980L120B	121.8	4.795	121.8	4.795	181.8	7.157	180	7.087	1.8	.071	10	.394	4
					13	★	MHS0980L150B	151.8	5.976	151.8	5.976	211.8	8.339	210	8.268	1.8	.071	10	.394	4
					18	★	MHS0980L200B	201.8	7.945	201.8	7.945	261.8	10.307	260	10.236	1.8	.071	10	.394	4
					23	★	MHS0980L250B	251.8	9.913	251.8	9.913	311.8	12.276	310	12.205	1.8	.071	10	.394	4
					28	★	MHS0980L300B	301.8	11.882	301.8	11.882	361.8	14.244	360	14.173	1.8	.071	10	.394	4

CUTTING CONDITIONS ➤ L126
HOW TO USE ➤ L127
TECHNICAL DATA ➤ N001

MHS

Drill Diameter DC					Hole Depth	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d	VP15TF		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
9.9	.3898				2	□	MHS0990L040B	42.1	1.657	42.1	1.657	102.1	4.020	100	3.937	2.1	.083	10	.394	3
					7	□	MHS0990L090B	91.8	3.614	91.8	3.614	151.8	5.976	150	5.906	1.8	.071	10	.394	4
					10	□	MHS0990L120B	121.8	4.795	121.8	4.795	181.8	7.157	180	7.087	1.8	.071	10	.394	4
					13	□	MHS0990L150B	151.8	5.976	151.8	5.976	211.8	8.339	210	8.268	1.8	.071	10	.394	4
					18	□	MHS0990L200B	201.8	7.945	201.8	7.945	261.8	10.307	260	10.236	1.8	.071	10	.394	4
					23	□	MHS0990L250B	251.8	9.913	251.8	9.913	311.8	12.276	310	12.205	1.8	.071	10	.394	4
					28	□	MHS0990L300B	301.8	11.882	301.8	11.882	361.8	14.244	360	14.173	1.8	.071	10	.394	4
10.0	.3937				1	★	MHS1000L040B	42.1	1.657	42.1	1.657	102.1	4.020	100	3.937	2.1	.083	10	.394	3
					6	★	MHS1000L090B	91.8	3.614	91.8	3.614	151.8	5.976	150	5.906	1.8	.071	10	.394	4
					9	★	MHS1000L120B	121.8	4.795	121.8	4.795	181.8	7.157	180	7.087	1.8	.071	10	.394	4
					12	★	MHS1000L150B	151.8	5.976	151.8	5.976	211.8	8.339	210	8.268	1.8	.071	10	.394	4
					17	★	MHS1000L200B	201.8	7.945	201.8	7.945	261.8	10.307	260	10.236	1.8	.071	10	.394	4
					22	★	MHS1000L250B	251.8	9.913	251.8	9.913	311.8	12.276	310	12.205	1.8	.071	10	.394	4
					27	★	MHS1000L300B	301.8	11.882	301.8	11.882	361.8	14.244	360	14.173	1.8	.071	10	.394	4
10.1	.3976				1	□	MHS1010L040B	40.6	1.598	42.1	1.657	102.1	4.020	100	3.937	2.1	.083	12	.472	3
					6	□	MHS1010L090B	90.3	3.555	91.8	3.614	151.8	5.976	150	5.906	1.8	.071	12	.472	4
					9	□	MHS1010L120B	120.3	4.736	121.8	4.795	181.8	7.157	180	7.087	1.8	.071	12	.472	4
					12	□	MHS1010L150B	150.3	5.917	151.8	5.976	211.8	8.339	210	8.268	1.8	.071	12	.472	4
					17	□	MHS1010L200B	200.3	7.886	201.8	7.945	261.8	10.307	260	10.236	1.8	.071	12	.472	4
					22	□	MHS1010L250B	250.3	9.854	251.8	9.913	311.8	12.276	310	12.205	1.8	.071	12	.472	4
					27	□	MHS1010L300B	300.3	11.823	301.8	11.882	361.8	14.244	360	14.173	1.8	.071	12	.472	4
10.2	.4016			M12x1.75	1	□	MHS1020L040B	40.6	1.598	42.1	1.657	102.1	4.020	100	3.937	2.1	.083	12	.472	3
					6	□	MHS1020L090B	90.4	3.559	91.9	3.618	151.9	5.980	150	5.906	1.9	.075	12	.472	4
					9	□	MHS1020L120B	120.4	4.740	121.9	4.799	181.9	7.161	180	7.087	1.9	.075	12	.472	4
					12	□	MHS1020L150B	150.4	5.921	151.9	5.980	211.9	8.343	210	8.268	1.9	.075	12	.472	4
					17	□	MHS1020L200B	200.4	7.890	201.9	7.949	261.9	10.311	260	10.236	1.9	.075	12	.472	4
					22	□	MHS1020L250B	250.4	9.858	251.9	9.917	311.9	12.280	310	12.205	1.9	.075	12	.472	4
					27	□	MHS1020L300B	300.4	11.827	301.9	11.886	361.9	14.248	360	14.173	1.9	.075	12	.472	4
10.3	.4055				1	□	MHS1030L040B	40.6	1.598	42.1	1.657	102.1	4.020	100	3.937	2.1	.083	12	.472	3
					6	□	MHS1030L090B	90.4	3.559	91.9	3.618	151.9	5.980	150	5.906	1.9	.075	12	.472	4
					9	□	MHS1030L120B	120.4	4.740	121.9	4.799	181.9	7.161	180	7.087	1.9	.075	12	.472	4
					12	□	MHS1030L150B	150.4	5.921	151.9	5.980	211.9	8.343	210	8.268	1.9	.075	12	.472	4
					17	□	MHS1030L200B	200.4	7.890	201.9	7.949	261.9	10.311	260	10.236	1.9	.075	12	.472	4
					22	□	MHS1030L250B	250.4	9.858	251.9	9.917	311.9	12.280	310	12.205	1.9	.075	12	.472	4
					26	□	MHS1030L300B	300.4	11.827	301.9	11.886	361.9	14.248	360	14.173	1.9	.075	12	.472	4
10.4	.4094				1	□	MHS1040L040B	40.7	1.602	42.2	1.661	102.2	4.024	100	3.937	2.2	.087	12	.472	3
					6	□	MHS1040L090B	90.4	3.559	91.9	3.618	151.9	5.980	150	5.906	1.9	.075	12	.472	4
					9	□	MHS1040L120B	120.4	4.740	121.9	4.799	181.9	7.161	180	7.087	1.9	.075	12	.472	4
					12	□	MHS1040L150B	150.4	5.921	151.9	5.980	211.9	8.343	210	8.268	1.9	.075	12	.472	4
					17	□	MHS1040L200B	200.4	7.890	201.9	7.949	261.9	10.311	260	10.236	1.9	.075	12	.472	4
					21	□	MHS1040L250B	250.4	9.858	251.9	9.917	311.9	12.280	310	12.205	1.9	.075	12	.472	4
					26	□	MHS1040L300B	300.4	11.827	301.9	11.886	361.9	14.248	360	14.173	1.9	.075	12	.472	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

Drill Diameter DC					Hole Depth	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d	VP15TF		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
10.5	.4134		Z		1	★	MHS1050L040B	40.7	1.602	42.2	1.661	102.2	4.024	100	3.937	2.2	.087	12	.472	3
					6	★	MHS1050L090B	90.4	3.559	91.9	3.618	151.9	5.980	150	5.906	1.9	.075	12	.472	4
					9	★	MHS1050L120B	120.4	4.740	121.9	4.799	181.9	7.161	180	7.087	1.9	.075	12	.472	4
					12	★	MHS1050L150B	150.4	5.921	151.9	5.980	211.9	8.343	210	8.268	1.9	.075	12	.472	4
					16	★	MHS1050L200B	200.4	7.890	201.9	7.949	261.9	10.311	260	10.236	1.9	.075	12	.472	4
					21	★	MHS1050L250B	250.4	9.858	251.9	9.917	311.9	12.280	310	12.205	1.9	.075	12	.472	4
					26	★	MHS1050L300B	300.4	11.827	301.9	11.886	361.9	14.248	360	14.173	1.9	.075	12	.472	4
10.6	.4173				1	□	MHS1060L040B	41.2	1.622	42.2	1.661	102.2	4.024	100	3.937	2.2	.087	12	.472	3
					6	□	MHS1060L090B	90.9	3.579	91.9	3.618	151.9	5.980	150	5.906	1.9	.075	12	.472	4
					9	□	MHS1060L120B	120.9	4.760	121.9	4.799	181.9	7.161	180	7.087	1.9	.075	12	.472	4
					12	□	MHS1060L150B	150.9	5.941	151.9	5.980	211.9	8.343	210	8.268	1.9	.075	12	.472	4
					16	□	MHS1060L200B	200.9	7.909	201.9	7.949	261.9	10.311	260	10.236	1.9	.075	12	.472	4
					21	□	MHS1060L250B	250.9	9.878	251.9	9.917	311.9	12.280	310	12.205	1.9	.075	12	.472	4
					26	□	MHS1060L300B	300.9	11.846	301.9	11.886	361.9	14.248	360	14.173	1.9	.075	12	.472	4
10.7	.4213				1	□	MHS1070L040B	41.2	1.622	42.2	1.661	102.2	4.024	100	3.937	2.2	.087	12	.472	3
					6	□	MHS1070L090B	91.0	3.583	92.0	3.622	152.0	5.984	150	5.906	2.0	.079	12	.472	4
					9	□	MHS1070L120B	121.0	4.764	122.0	4.803	182.0	7.165	180	7.087	2.0	.079	12	.472	4
					11	□	MHS1070L150B	151.0	5.945	152.0	5.984	212.0	8.346	210	8.268	2.0	.079	12	.472	4
					16	□	MHS1070L200B	201.0	7.913	202.0	7.953	262.0	10.315	260	10.236	2.0	.079	12	.472	4
					21	□	MHS1070L250B	251.0	9.882	252.0	9.921	312.0	12.283	310	12.205	2.0	.079	12	.472	4
					25	□	MHS1070L300B	301.0	11.850	302.0	11.890	362.0	14.252	360	14.173	2.0	.079	12	.472	4
10.8	.4252			M12x1.25	1	★	MHS1080L040B	41.2	1.622	42.2	1.661	102.2	4.024	100	3.937	2.2	.087	12	.472	3
					6	★	MHS1080L090B	91.0	3.583	92.0	3.622	152.0	5.984	150	5.906	2.0	.079	12	.472	4
					9	★	MHS1080L120B	121.0	4.764	122.0	4.803	182.0	7.165	180	7.087	2.0	.079	12	.472	4
					11	★	MHS1080L150B	151.0	5.945	152.0	5.984	212.0	8.346	210	8.268	2.0	.079	12	.472	4
					16	★	MHS1080L200B	201.0	7.913	202.0	7.953	262.0	10.315	260	10.236	2.0	.079	12	.472	4
					21	★	MHS1080L250B	251.0	9.882	252.0	9.921	312.0	12.283	310	12.205	2.0	.079	12	.472	4
					25	★	MHS1080L300B	301.0	11.850	302.0	11.890	362.0	14.252	360	14.173	2.0	.079	12	.472	4
10.9	.4291				1	□	MHS1090L040B	41.3	1.626	42.3	1.665	102.3	4.028	100	3.937	2.3	.091	12	.472	3
					6	□	MHS1090L090B	91.0	3.583	92.0	3.622	152.0	5.984	150	5.906	2.0	.079	12	.472	4
					8	□	MHS1090L120B	121.0	4.764	122.0	4.803	182.0	7.165	180	7.087	2.0	.079	12	.472	4
					11	□	MHS1090L150B	151.0	5.945	152.0	5.984	212.0	8.346	210	8.268	2.0	.079	12	.472	4
					16	□	MHS1090L200B	201.0	7.913	202.0	7.953	262.0	10.315	260	10.236	2.0	.079	12	.472	4
					20	□	MHS1090L250B	251.0	9.882	252.0	9.921	312.0	12.283	310	12.205	2.0	.079	12	.472	4
					25	□	MHS1090L300B	301.0	11.850	302.0	11.890	362	14.252	360	14.173	2.0	.079	12	.472	4
11.0	.4331				1	★	MHS1100L040B	41.3	1.626	42.3	1.665	102.3	4.028	100	3.937	2.3	.091	12	.472	3
					6	★	MHS1100L090B	91.0	3.583	92.0	3.622	152.0	5.984	150	5.906	2.0	.079	12	.472	4
					8	★	MHS1100L120B	121.0	4.764	122.0	4.803	182.0	7.165	180	7.087	2.0	.079	12	.472	4
					11	★	MHS1100L150B	151.0	5.945	152.0	5.984	212.0	8.346	210	8.268	2.0	.079	12	.472	4
					16	★	MHS1100L200B	201.0	7.913	202.0	7.953	262.0	10.315	260	10.236	2.0	.079	12	.472	4
					20	★	MHS1100L250B	251.0	9.882	252.0	9.921	312.0	12.283	310	12.205	2.0	.079	12	.472	4
					25	★	MHS1100L300B	301.0	11.850	302.0	11.890	362.0	14.252	360	14.173	2.0	.079	12	.472	4

DRILLING

CUTTING CONDITIONS ➤ L126
HOW TO USE ➤ L127
TECHNICAL DATA ➤ N001

MHS

Drill Diameter DC					Hole Depth	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d	VP15TF		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
11.1	.4370				1	□	MHS1110L040B	41.8	1.646	42.3	1.665	102.3	4.028	100	3.937	2.3	.091	12	.472	3
					6	□	MHS1110L090B	91.5	3.602	92.0	3.622	152.0	5.984	150	5.906	2.0	.079	12	.472	4
					8	□	MHS1110L120B	121.5	4.783	122.0	4.803	182.0	7.165	180	7.087	2.0	.079	12	.472	4
					11	□	MHS1110L150B	151.5	5.965	152.0	5.984	212.0	8.346	210	8.268	2.0	.079	12	.472	4
					15	□	MHS1110L200B	201.5	7.933	202.0	7.953	262.0	10.315	260	10.236	2.0	.079	12	.472	4
					20	□	MHS1110L250B	251.5	9.902	252.0	9.921	312.0	12.283	310	12.205	2.0	.079	12	.472	4
					24	□	MHS1110L300B	301.5	11.870	302.0	11.890	362.0	14.252	360	14.173	2.0	.079	12	.472	4
11.2	.4409				1	□	MHS1120L040B	41.8	1.646	42.3	1.665	102.3	4.028	100	3.937	2.3	.091	12	.472	3
					5	□	MHS1120L090B	91.5	3.602	92.0	3.622	152.0	5.984	150	5.906	2.0	.079	12	.472	4
					8	□	MHS1120L120B	121.5	4.783	122.0	4.803	182.0	7.165	180	7.087	2.0	.079	12	.472	4
					11	□	MHS1120L150B	151.5	5.965	152.0	5.984	212.0	8.346	210	8.268	2.0	.079	12	.472	4
					15	□	MHS1120L200B	201.5	7.933	202.0	7.953	262.0	10.315	260	10.236	2.0	.079	12	.472	4
					20	□	MHS1120L250B	251.5	9.902	252.0	9.921	312.0	12.283	310	12.205	2.0	.079	12	.472	4
					24	□	MHS1120L300B	301.5	11.870	302.0	11.890	362	14.252	360	14.173	2.0	.079	12	.472	4
11.3	.4449				1	□	MHS1130L040B	41.8	1.646	42.3	1.665	102.3	4.028	100	3.937	2.3	.091	12	.472	3
					5	□	MHS1130L090B	91.6	3.606	92.1	3.626	152.1	5.988	150	5.906	2.1	.083	12	.472	4
					8	□	MHS1130L120B	121.6	4.787	122.1	4.807	182.1	7.169	180	7.087	2.1	.083	12	.472	4
					11	□	MHS1130L150B	151.6	5.969	152.1	5.988	212.1	8.350	210	8.268	2.1	.083	12	.472	4
					15	□	MHS1130L200B	201.6	7.937	202.1	7.957	262.1	10.319	260	10.236	2.1	.083	12	.472	4
					20	□	MHS1130L250B	251.6	9.906	252.1	9.925	312.1	12.287	310	12.205	2.1	.083	12	.472	4
					24	□	MHS1130L300B	301.6	11.874	302.1	11.894	362.1	14.256	360	14.173	2.1	.083	12	.472	4
11.4	.4488				1	□	MHS1140L040B	41.9	1.650	42.4	1.669	102.4	4.031	100	3.937	2.4	.094	12	.472	3
					5	□	MHS1140L090B	91.6	3.606	92.1	3.626	152.1	5.988	150	5.906	2.1	.083	12	.472	4
					8	□	MHS1140L120B	121.6	4.787	122.1	4.807	182.1	7.169	180	7.087	2.1	.083	12	.472	4
					11	□	MHS1140L150B	151.6	5.969	152.1	5.988	212.1	8.350	210	8.268	2.1	.083	12	.472	4
					15	□	MHS1140L200B	201.6	7.937	202.1	7.957	262.1	10.319	260	10.236	2.1	.083	12	.472	4
					19	□	MHS1140L250B	251.6	9.906	252.1	9.925	312.1	12.287	310	12.205	2.1	.083	12	.472	4
					24	□	MHS1140L300B	301.6	11.874	302.1	11.894	362.1	14.256	360	14.173	2.1	.083	12	.472	4
11.5	.4528				1	★	MHS1150L040B	41.9	1.650	42.4	1.669	102.4	4.031	100	3.937	2.4	.094	12	.472	3
					5	★	MHS1150L090B	91.6	3.606	92.1	3.626	152.1	5.988	150	5.906	2.1	.083	12	.472	4
					8	★	MHS1150L120B	121.6	4.787	122.1	4.807	182.1	7.169	180	7.087	2.1	.083	12	.472	4
					10	★	MHS1150L150B	151.6	5.969	152.1	5.988	212.1	8.350	210	8.268	2.1	.083	12	.472	4
					15	★	MHS1150L200B	201.6	7.937	202.1	7.957	262.1	10.319	260	10.236	2.1	.083	12	.472	4
					19	★	MHS1150L250B	251.6	9.906	252.1	9.925	312.1	12.287	310	12.205	2.1	.083	12	.472	4
					24	★	MHS1150L300B	301.6	11.874	302.1	11.894	362.1	14.256	360	14.173	2.1	.083	12	.472	4
11.6	.4567				1	□	MHS1160L040B	42.4	1.669	42.4	1.669	102.4	4.031	100	3.937	2.4	.094	12	.472	3
					5	□	MHS1160L090B	92.1	3.626	92.1	3.626	152.1	5.988	150	5.906	2.1	.083	12	.472	4
					8	□	MHS1160L120B	122.1	4.807	122.1	4.807	182.1	7.169	180	7.087	2.1	.083	12	.472	4
					10	□	MHS1160L150B	152.1	5.988	152.1	5.988	212.1	8.350	210	8.268	2.1	.083	12	.472	4
					15	□	MHS1160L200B	202.1	7.957	202.1	7.957	262.1	10.319	260	10.236	2.1	.083	12	.472	4
					19	□	MHS1160L250B	252.1	9.925	252.1	9.925	312.1	12.287	310	12.205	2.1	.083	12	.472	4
					23	□	MHS1160L300B	302.1	11.894	302.1	11.894	362.1	14.256	360	14.173	2.1	.083	12	.472	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

Drill Diameter **DC**					Hole Depth	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d	VP15TF		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					1	□	**MHS1170L040B**	42.4	1.669	42.4	1.669	102.4	4.031	100	3.937	2.4	.094	12	.472	3
					5	□	MHS**1170L090B**	92.1	3.626	92.1	3.626	152.1	5.988	150	5.906	2.1	.083	12	.472	4
					8	□	MHS**1170L120B**	122.1	4.807	122.1	4.807	182.1	7.169	180	7.087	2.1	.083	12	.472	4
11.7	**.4606**				10	□	MHS**1170L150B**	152.1	5.988	152.1	5.988	212.1	8.350	210	8.268	2.1	.083	12	.472	4
					15	□	MHS**1170L200B**	202.1	7.957	202.1	7.957	262.1	10.319	260	10.236	2.1	.083	12	.472	4
					19	□	MHS**1170L250B**	252.1	9.925	252.1	9.925	312.1	12.287	310	12.205	2.1	.083	12	.472	4
					23	□	MHS**1170L300B**	302.1	11.894	302.1	11.894	362.1	14.256	360	14.173	2.1	.083	12	.472	4
					1	★	MHS**1180L040B**	42.4	1.669	42.4	1.669	102.4	4.031	100	3.937	2.4	.094	12	.472	3
					5	★	MHS**1180L090B**	92.2	3.630	92.2	3.630	152.2	5.992	150	5.906	2.2	.087	12	.472	4
					8	★	MHS**1180L120B**	122.2	4.811	122.2	4.811	182.2	7.173	180	7.087	2.2	.087	12	.472	4
11.8	**.4646**				10	★	MHS**1180L150B**	152.2	5.992	152.2	5.992	212.2	8.354	210	8.268	2.2	.087	12	.472	4
					14	★	MHS**1180L200B**	202.2	7.961	202.2	7.961	262.2	10.323	260	10.236	2.2	.087	12	.472	4
					19	★	MHS**1180L250B**	252.2	9.929	252.2	9.929	312.2	12.291	310	12.205	2.2	.087	12	.472	4
					23	★	MHS**1180L300B**	302.2	11.898	302.2	11.898	362.2	14.260	360	14.173	2.2	.087	12	.472	4
					1	□	MHS**1190L040B**	42.5	1.673	42.5	1.673	102.5	4.035	100	3.937	2.5	.098	12	.472	3
					5	□	MHS**1190L090B**	92.2	3.630	92.2	3.630	152.2	5.992	150	5.906	2.2	.087	12	.472	4
					8	□	MHS**1190L120B**	122.2	4.811	122.2	4.811	182.2	7.173	180	7.087	2.2	.087	12	.472	4
11.9	**.4685**	**15/32**			10	□	MHS**1190L150B**	152.2	5.992	152.2	5.992	212.2	8.354	210	8.268	2.2	.087	12	.472	4
					14	□	MHS**1190L200B**	202.2	7.961	202.2	7.961	262.2	10.323	260	10.236	2.2	.087	12	.472	4
					19	□	MHS**1190L250B**	252.2	9.929	252.2	9.929	312.2	12.291	310	12.205	2.2	.087	12	.472	4
					23	□	MHS**1190L300B**	302.2	11.898	302.2	11.898	362.2	14.260	360	14.173	2.2	.087	12	.472	4
					1	★	MHS**1200L040B**	42.5	1.673	42.5	1.673	102.5	4.035	100	3.937	2.5	.098	12	.472	3
					5	★	MHS**1200L090B**	92.2	3.630	92.2	3.630	152.2	5.992	150	5.906	2.2	.087	12	.472	4
					7	★	MHS**1200L120B**	122.2	4.811	122.2	4.811	182.2	7.173	180	7.087	2.2	.087	12	.472	4
12.0	**.4724**			M14x2.0	10	★	MHS**1200L150B**	152.2	5.992	152.2	5.992	212.2	8.354	210	8.268	2.2	.087	12	.472	4
					14	★	MHS**1200L200B**	202.2	7.961	202.2	7.961	262.2	10.323	260	10.236	2.2	.087	12	.472	4
					18	★	MHS**1200L250B**	252.2	9.929	252.2	9.929	312.2	12.291	310	12.205	2.2	.087	12	.472	4
					22	★	MHS**1200L300B**	302.2	11.898	302.2	11.898	362.2	14.260	360	14.173	2.2	.087	12	.472	4

CUTTING CONDITIONS ➤ L126
HOW TO USE ➤ L127
TECHNICAL DATA ➤ N001

MHS

RECOMMENDED CUTTING CONDITIONS

Work Material	Mild Steel (≤180HB) Carbon Steel, Alloy Steel (180-280HB) AISI 1010, 1045, 4140 etc.		Austenitic Stainless Steel (≤200HB) Ferritic, Martensitic Stainless Steel (>200HB) AISI 304, 316 AISI 431, 420 etc.	
Drill Dia. **DC**	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch / mm				
.0394 (1.0)	130 (100—150)	.0015 (.0008—.0016)	65 (50—80)	.0011 (.0008—.0016)
.0472 (1.2)	165 (130—180)	.0018 (.0010—.0020)	100 (65—115)	.0013 (.0010—.0020)
.0630 (1.6)	195 (150—230)	.0024 (.0012—.0026)	130 (100—150)	.0017 (.0012—.0026)
.0787 (2.0)	230 (180—260)	.0030 (.0016—.0031)	165 (130—180)	.0021 (.0016—.0031)
.0984 (2.5)	260 (195—295)	.0037 (.0020—.0039)	195 (150—230)	.0026 (.0020—.0039)
.1260 (3.2)	260 (195—295)	.0047 (.0028—.0051)	195 (150—230)	.0035 (.0028—.0051)
.1575 (4.0)	260 (195—295)	.0059 (.0035—.0043)	195 (150—230)	.0043 (.0031—.0035)
.1969 (5.0)	260 (195—295)	.0075 (.0043—.0055)	195 (150—230)	.0055 (.0039—.0047)
.2480 (6.3)	260 (195—295)	.0067 (.0055—.0071)	195 (150—230)	.0059 (.0051—.0059)
.3150 (8.0)	260 (195—295)	.0087 (.0071—.0091)	195 (150—230)	.0075 (.0063—.0075)
.3937 (10.0)	260 (195—295)	.0106 (.0087—.0110)	195 (150—230)	.0094 (.0079—.0091)
.4724 (12.0)	260 (195—295)	.0126 (.0106—.0134)	195 (150—230)	.0114 (.0094—.0110)

Work Material	Pre-hardened Steel (35-45HRC) Alloy Tool Steel (≤350HB) AISI P21, P20 ASTM H13, AISI L6 etc.		Hardened Steel (40-55HRC) Precipitation Hardening Martensitic Stainless Steel (<450HB) AISI 431, 420 S17400, S17700 etc.	
Drill Dia. **DC**	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch / mm				
.0394 (1.0)	65 (50—80)	.0009 (.0008—.0012)	130 (100—150)	.0007 (.0006—.0010)
.0472 (1.2)	100 (65—115)	.0011 (.0008—.0014)	130 (100—150)	.0009 (.0008—.0012)
.0630 (1.6)	130 (100—150)	.0015 (.0012—.0018)	165 (130—180)	.0012 (.0010—.0016)
.0787 (2.0)	165 (130—180)	.0019 (.0014—.0024)	165 (130—180)	.0015 (.0012—.0020)
.0984 (2.5)	195 (150—230)	.0023 (.0018—.0030)	195 (150—230)	.0019 (.0016—.0026)
.1260 (3.2)	195 (150—230)	.0031 (.0024—.0035)	195 (150—230)	.0024 (.0020—.0031)
.1575 (4.0)	195 (150—230)	.0039 (.0028—.0039)	195 (150—230)	.0031 (.0024—.0039)
.1969 (5.0)	195 (150—230)	.0047 (.0035—.0051)	195 (150—230)	.0039 (.0031—.0051)
.2480 (6.3)	195 (150—230)	.0055 (.0043—.0063)	195 (150—230)	.0043 (.0035—.0051)
.3150 (8.0)	195 (150—230)	.0067 (.0055—.0079)	195 (150—230)	.0055 (.0047—.0063)
.3937 (10.0)	195 (150—230)	.0083 (.0067—.0098)	195 (150—230)	.0071 (.0055—.0079)
.4724 (12.0)	195 (150—230)	.0098 (.0083—.0118)	195 (150—230)	.0083 (.0067—.0094)

Work Material	Hardened Steel (40-55HRC) Heat Resistant Alloy ASTM H13, AISI L6 Inconel718 etc.	
Drill Dia. **DC**	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch / mm		
.0394 (1.0)	35 (15—50)	.0006 (.0006—.0008)
.0472 (1.2)	35 (15—50)	.0007 (.0006—.0010)
.0630 (1.6)	35 (15—50)	.0010 (.0008—.0012)
.0787 (2.0)	65 (50—80)	.0013 (.0010—.0016)
.0984 (2.5)	65 (50—80)	.0015 (.0012—.0020)
.1260 (3.2)	65 (50—80)	.0024 (.0016—.0028)
.1575 (4.0)	100 (65—115)	.0028 (.0020—.0031)
.1969 (5.0)	100 (65—115)	.0031 (.0024—.0039)
.2480 (6.3)	100 (65—115)	.0039 (.0031—.0043)
.3150 (8.0)	130 (100—150)	.0047 (.0039—.0051)
.3937 (10.0)	130 (100—150)	.0059 (.0051—.0067)
.4724 (12.0)	130 (100—150)	.0071 (.0059—.0079)

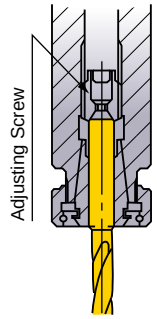
(Note 1) When using the drill with a length over l/d 10, it is necessary to use a pilot hole as a guide. (If no pilot hole is used then drill breakage can occur)

(Note 2) Use the shortest flute drill in the respective size as a pilot drill.

(Note 3) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

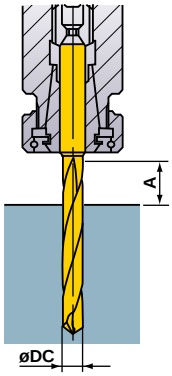
OPERATIONAL GUIDANCE FOR THE MHS DRILL

Drill Holding



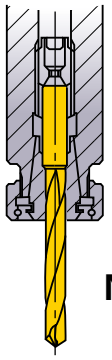
Thrust bearing type collet chuck holds the drill securely.

Drill Length



A ≥ DC x 1.5

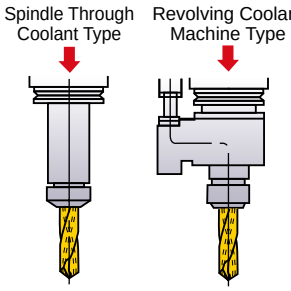
Drill Installation



NG

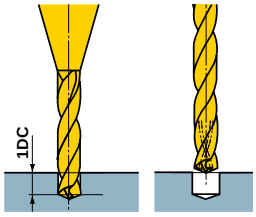
Do not clamp on the flutes.

Through Coolant Type



Less than ø.118 : 1.5MPa-7MP
More than ø.118 : 0.5MPa-7MPa
More than 3MPa is recommended.

Drill Installation



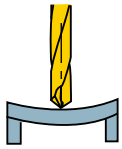
① Drill a prepared hole about 1DC using the shortest flute length of MHS. (DC=drill diameter)
② Use the prepared hole as a guide when using a drill with an oil hole. Depending on the cutting conditions, peck feed is recommended.

Coolant Handling

1) Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure.

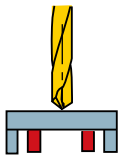
2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

Thin Workpiece



If Bending Occurs

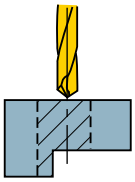
NG



Support the Workpiece

Good

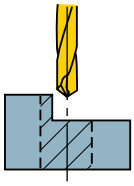
Interrupted Cutting



One process

Good

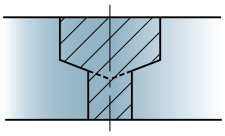
①Lower the feed when drilling the interrupted part.



Requires prior machining

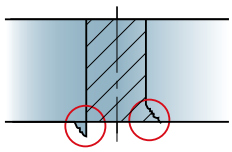
①Spot face with an end mill prior to drilling.

Stepped Holes



①Divide the two processes.
②Drill the larger hole first.
✱A tool for machining both chamfer and spot face can be produced to order.

Burring and Workpiece Chipping



①Lower the feed rate by 50% at the end of through cutting.
②Change the point angle.

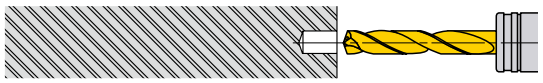
DRILLING

MHS

OPERATIONAL GUIDANCE FOR THE MHS LONG TYPE DRILL (L/D≥10)

FLAT FACE DRILLING ●Drilling a blind hole

1. Drilling a pilot hole



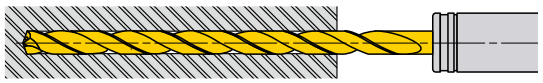
①Use a drill with the same or larger point angle than the super long type. Use the shortest flute possible.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx 1DC.
(Adjust the pilot hole depth according to the length of the long type drill.)

2. Initial cutting with the long type drill



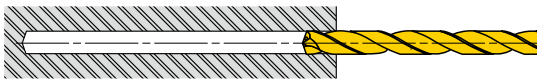
①Penetrate the guide hole at low revolution.
(Revolution 1000 RPM, feed rate .008—.012 IPR)
②Stop the long type drill .020—.039 inch short of the guide hole bottom.

3. Drill the deep hole



①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

4. Drill retraction



①After drilling, lower the cutting revolution about .020—.039 inch short of the hole end. (Revolution 1000 RPM)
②Retract the drill to the pilot hole depth starting point at a feed rate of 118.1 IPM.
③Finally, clear the hole at a cutting speed of 66—98 SFM and feed rate of .008—.012 IPR.

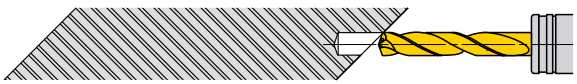
INTERRUPED DRILLING ●Drilling and breaking through on irregular faces or angles

1. Spot facing



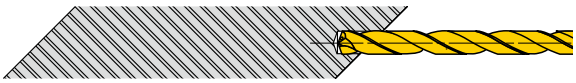
①Machine a flat on the irregular face by using an end mill or slot drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



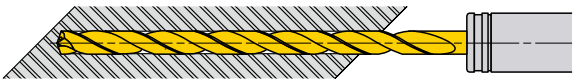
①Use a drill with the same or larger point angle than the super long type. Use the shortest flute possible.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx 1DC.
(Adjust the pilot hole depth according to the length of the long type drill.)

3. Initial cutting with the long type drill



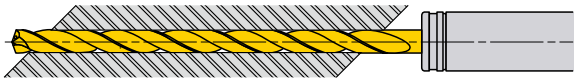
①Penetrate the guide hole at a low revolution.
(Revolution 1000 RPM, feed rate .008—.012 IPR)
②Stop the long type drill .020—.039 inch short of the guide hole bottom.

4. Drill the deep hole



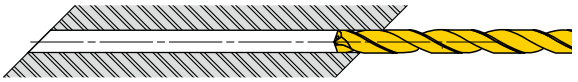
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.
②Feed as usual until breaking through.

5. Breaking through



①When breaking through, the cutting edge can be damaged.
②Recommend about half rate of the usual feed rate after breaking through.

6. Drill retraction



①Finally clear the hole at a revolution speed 1000 RPM and feed rate of .008—.012 IPR.
②Retract the drill to the pilot hole depth starting point at a feed rate of 118.1 IPM.

Memo

MNS/MNS...DB

- Unique 4 hole, high flow, coolant delivery system prevents built-up-edge.
- Long drill life and highly efficient drilling of holes in aluminum.

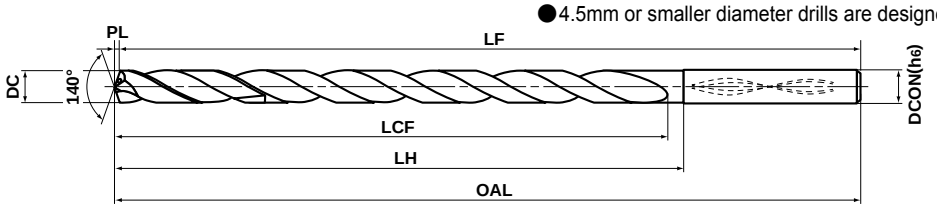
P | M | K | **N** | S | H

Tolerance	DC=3	3<DC≤6	6<DC≤10	10<DC≤14
DC (mm)	$^{0}_{-0.014}$	$^{0}_{-0.018}$	$^{0}_{-0.022}$	$^{0}_{-0.027}$
DCON (mm)	$^{0}_{-0.006}$	$^{0}_{-0.008}$	$^{0}_{-0.009}$	$^{0}_{-0.011}$

METRIC STANDARD



- 4.5mm or smaller diameter drills are designed with 2 coolant holes.



(Note) MNS type can be used for shrink fit holders.

Internal Coolant

DC (mm)	Hole Depth l/d	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
3.0	5	★	MNS0300LB	33.5	33.5	81.5	81	0.5	3
	10	★	MNS0300X10DB	39.5	42.5	90.5	90	0.5	3
	20	★	MNS0300X20DB	69.5	72.5	120.5	120	0.5	3
	30	★	MNS0300X30DB	99.5	102.5	150.5	150	0.5	3
3.1	5	★	MNS0310LB	39.6	39.6	87.6	87	0.6	4
	10	□	MNS0310X10DB	46.6	49.6	97.6	97	0.6	4
	20	□	MNS0310X20DB	81.6	84.6	132.6	132	0.6	4
	30	□	MNS0310X30DB	116.6	119.6	167.6	167	0.6	4
3.2	5	★	MNS0320LB	39.6	39.6	87.6	87	0.6	4
	10	★	MNS0320X10DB	46.6	49.6	97.6	97	0.6	4
	20	★	MNS0320X20DB	81.6	84.6	132.6	132	0.6	4
	30	★	MNS0320X30DB	116.6	119.6	167.6	167	0.6	4
3.3	5	★	MNS0330LB	39.6	39.6	87.6	87	0.6	4
	10	□	MNS0330X10DB	46.6	49.6	97.6	97	0.6	4
	20	□	MNS0330X20DB	81.6	84.6	132.6	132	0.6	4
	30	□	MNS0330X30DB	116.6	119.6	167.6	167	0.6	4
3.4	5	★	MNS0340LB	39.6	39.6	87.6	87	0.6	4
	10	★	MNS0340X10DB	46.6	49.6	97.6	97	0.6	4
	20	★	MNS0340X20DB	81.6	84.6	132.6	132	0.6	4
	30	★	MNS0340X30DB	116.6	119.6	167.6	167	0.6	4
3.5	5	★	MNS0350LB	39.6	39.6	87.6	87	0.6	4
	10	□	MNS0350X10DB	46.6	49.6	97.6	97	0.6	4
	20	□	MNS0350X20DB	81.6	84.6	132.6	132	0.6	4
	30	□	MNS0350X30DB	116.6	119.6	167.6	167	0.6	4
3.6	5	★	MNS0360LB	44.7	44.7	92.7	92	0.7	4
	10	★	MNS0360X10DB	52.7	55.7	103.7	103	0.7	4
	20	★	MNS0360X20DB	92.7	95.7	143.7	143	0.7	4
	30	★	MNS0360X30DB	132.7	135.7	183.7	183	0.7	4
3.7	5	★	MNS0370LB	44.7	44.7	92.7	92	0.7	4
	10	□	MNS0370X10DB	52.7	55.7	103.7	103	0.7	4
	20	□	MNS0370X20DB	92.7	95.7	143.7	143	0.7	4
	30	□	MNS0370X30DB	132.7	135.7	183.7	183	0.7	4

Internal Coolant

DC (mm)	Hole Depth l/d	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
3.8	5	★	MNS0380LB	44.7	44.7	92.7	92	0.7	4
	10	□	MNS0380X10DB	52.7	55.7	103.7	103	0.7	4
	20	□	MNS0380X20DB	92.7	95.7	143.7	143	0.7	4
	30	□	MNS0380X30DB	132.7	135.7	183.7	183	0.7	4
3.9	5	★	MNS0390LB	44.7	44.7	92.7	92	0.7	4
	10	★	MNS0390X10DB	52.7	55.7	103.7	103	0.7	4
	20	★	MNS0390X20DB	92.7	95.7	143.7	143	0.7	4
	30	★	MNS0390X30DB	132.7	135.7	183.7	183	0.7	4
4.0	5	★	MNS0400LB	44.7	44.7	92.7	92	0.7	4
	10	★	MNS0400X10DB	52.7	55.7	103.7	103	0.7	4
	20	★	MNS0400X20DB	92.7	95.7	143.7	143	0.7	4
	30	★	MNS0400X30DB	132.7	135.7	183.7	183	0.7	4
4.1	5	★	MNS0410LB	50.7	50.7	100.7	100	0.7	5
	10	□	MNS0410X10DB	59.7	62.7	112.7	112	0.7	5
	20	□	MNS0410X20DB	104.7	107.7	157.7	157	0.7	5
	30	□	MNS0410X30DB	149.7	152.7	202.7	202	0.7	5
4.2	5	★	MNS0420LB	50.8	50.8	100.8	100	0.8	5
	10	□	MNS0420X10DB	59.8	62.8	112.8	112	0.8	5
	20	□	MNS0420X20DB	104.8	107.8	157.8	157	0.8	5
	30	□	MNS0420X30DB	149.8	152.8	202.8	202	0.8	5
4.3	5	★	MNS0430LB	50.8	50.8	100.8	100	0.8	5
	10	□	MNS0430X10DB	59.8	62.8	112.8	112	0.8	5
	20	□	MNS0430X20DB	104.8	107.8	157.8	157	0.8	5
	30	□	MNS0430X30DB	149.8	152.8	202.8	202	0.8	5
4.4	5	★	MNS0440LB	50.8	50.8	100.8	100	0.8	5
	10	□	MNS0440X10DB	59.8	62.8	112.8	112	0.8	5
	20	□	MNS0440X20DB	104.8	107.8	157.8	157	0.8	5
	30	□	MNS0440X30DB	149.8	152.8	202.8	202	0.8	5
4.5	5	★	MNS0450LB	50.8	50.8	100.8	100	0.8	5
	10	□	MNS0450X10DB	59.8	62.8	112.8	112	0.8	5
	20	□	MNS0450X20DB	104.8	107.8	157.8	157	0.8	5
	30	□	MNS0450X30DB	149.8	152.8	202.8	202	0.8	5

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.

Internal Coolant

DC (mm)	Hole Depth l/d	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
4.6	5	★	MNS0460LB	55.8	55.8	105.8	105	0.8	5
	10	□	MNS0460X10DB	65.8	68.8	118.8	118	0.8	5
	20	□	MNS0460X20DB	115.8	118.8	168.8	168	0.8	5
	30	□	MNS0460X30DB	165.8	168.8	218.8	218	0.8	5
4.7	5	★	MNS0470LB	55.9	55.9	105.9	105	0.9	5
	10	□	MNS0470X10DB	65.9	68.9	118.9	118	0.9	5
	20	□	MNS0470X20DB	115.9	118.9	168.9	168	0.9	5
	30	□	MNS0470X30DB	165.9	168.9	218.9	218	0.9	5
4.8	5	★	MNS0480LB	55.9	55.9	105.9	105	0.9	5
	10	□	MNS0480X10DB	65.9	68.9	118.9	118	0.9	5
	20	□	MNS0480X20DB	115.9	118.9	168.9	168	0.9	5
	30	□	MNS0480X30DB	165.9	168.9	218.9	218	0.9	5
4.9	5	★	MNS0490LB	55.9	55.9	105.9	105	0.9	5
	10	★	MNS0490X10DB	65.9	68.9	118.9	118	0.9	5
	20	★	MNS0490X20DB	115.9	118.9	168.9	168	0.9	5
	30	★	MNS0490X30DB	165.9	168.9	218.9	218	0.9	5
5.0	5	★	MNS0500LB	44.9	44.9	100.9	100	0.9	6
	10	★	MNS0500X10DB	65.9	68.9	118.9	118	0.9	5
	20	★	MNS0500X20DB	115.9	118.9	168.9	168	0.9	5
	30	★	MNS0500X30DB	165.9	168.9	218.9	218	0.9	5
5.1	5	★	MNS0510LB	44.9	44.9	100.9	100	0.9	6
	10	★	MNS0510X10DB	72.9	75.9	127.9	127	0.9	6
	20	★	MNS0510X20DB	127.9	130.9	182.9	182	0.9	6
	30	★	MNS0510X30DB	182.9	185.9	237.9	237	0.9	6
5.2	5	★	MNS0520LB	44.9	44.9	100.9	100	0.9	6
	10	□	MNS0520X10DB	72.9	75.9	127.9	127	0.9	6
	20	□	MNS0520X20DB	127.9	130.9	182.9	182	0.9	6
	30	□	MNS0520X30DB	182.9	185.9	237.9	237	0.9	6
5.3	5	★	MNS0530LB	45.0	45.0	101.0	100	1.0	6
	10	□	MNS0530X10DB	73.0	76.0	128.0	127	1.0	6
	20	□	MNS0530X20DB	128.0	131.0	183.0	182	1.0	6
	30	□	MNS0530X30DB	183.0	186.0	238.0	237	1.0	6
5.4	5	★	MNS0540LB	45.0	45.0	101.0	100	1.0	6
	10	□	MNS0540X10DB	73.0	76.0	128.0	127	1.0	6
	20	□	MNS0540X20DB	128.0	131.0	183.0	182	1.0	6
	30	□	MNS0540X30DB	183.0	186.0	238.0	237	1.0	6
5.5	5	★	MNS0550LB	45.0	45.0	101.0	100	1.0	6
	10	★	MNS0550X10DB	73.0	76.0	128.0	127	1.0	6
	20	★	MNS0550X20DB	128.0	131.0	183.0	182	1.0	6
	30	★	MNS0550X30DB	183.0	186.0	238.0	237	1.0	6
5.6	5	★	MNS0560LB	49.0	49.0	101.0	100	1.0	6
	10	□	MNS0560X10DB	79.0	82.0	134.0	133	1.0	6
	20	□	MNS0560X20DB	139.0	142.0	194.0	193	1.0	6
	30	□	MNS0560X30DB	199.0	202.0	254.0	253	1.0	6

Internal Coolant

DC (mm)	Hole Depth l/d	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
5.7	5	★	MNS0570LB	49.0	49.0	101.0	100	1.0	6
	10	□	MNS0570X10DB	79.0	82.0	134.0	133	1.0	6
	20	□	MNS0570X20DB	139.0	142.0	194.0	193	1.0	6
	30	□	MNS0570X30DB	199.0	202.0	254.0	253	1.0	6
5.8	5	★	MNS0580LB	49.1	49.1	101.1	100	1.1	6
	10	□	MNS0580X10DB	79.1	82.1	134.1	133	1.1	6
	20	□	MNS0580X20DB	139.1	142.1	194.1	193	1.1	6
	30	□	MNS0580X30DB	199.1	202.1	254.1	253	1.1	6
5.9	5	★	MNS0590LB	49.1	49.1	101.1	100	1.1	6
	10	□	MNS0590X10DB	79.1	82.1	134.1	133	1.1	6
	20	□	MNS0590X20DB	139.1	142.1	194.1	193	1.1	6
	30	□	MNS0590X30DB	199.1	202.1	254.1	253	1.1	6
6.0	5	★	MNS0600LB	49.1	49.1	101.1	100	1.1	6
	10	★	MNS0600X10DB	79.1	82.1	134.1	133	1.1	6
	20	★	MNS0600X20DB	139.1	142.1	194.1	193	1.1	6
	30	★	MNS0600X30DB	199.1	202.1	254.1	253	1.1	6
6.1	5	★	MNS0610LB	53.1	53.1	110.1	109	1.1	7
	10	★	MNS0610X10DB	86.1	89.1	142.1	141	1.1	7
	20	★	MNS0610X20DB	151.1	154.1	207.1	206	1.1	7
	30	★	MNS0610X30DB	216.1	219.1	272.1	271	1.1	7
6.2	5	★	MNS0620LB	53.1	53.1	110.1	109	1.1	7
	10	□	MNS0620X10DB	86.1	89.1	142.1	141	1.1	7
	20	□	MNS0620X20DB	151.1	154.1	207.1	206	1.1	7
	30	□	MNS0620X30DB	216.1	219.1	272.1	271	1.1	7
6.3	5	★	MNS0630LB	53.1	53.1	110.1	109	1.1	7
	10	□	MNS0630X10DB	86.1	89.1	142.1	141	1.1	7
	20	□	MNS0630X20DB	151.1	154.1	207.1	206	1.1	7
	30	□	MNS0630X30DB	216.1	219.1	272.1	271	1.1	7
6.4	5	★	MNS0640LB	53.2	53.2	110.2	109	1.2	7
	10	□	MNS0640X10DB	86.2	89.2	142.2	141	1.2	7
	20	□	MNS0640X20DB	151.2	154.2	207.2	206	1.2	7
	30	□	MNS0640X30DB	216.2	219.2	272.2	271	1.2	7
6.5	5	★	MNS0650LB	53.2	53.2	110.2	109	1.2	7
	10	★	MNS0650X10DB	86.2	89.2	142.2	141	1.2	7
	20	★	MNS0650X20DB	151.2	154.2	207.2	206	1.2	7
	30	★	MNS0650X30DB	216.2	219.2	272.2	271	1.2	7
6.6	5	★	MNS0660LB	57.2	57.2	110.2	109	1.2	7
	10	□	MNS0660X10DB	92.2	95.2	148.2	147	1.2	7
	20	□	MNS0660X20DB	162.2	165.2	218.2	217	1.2	7
	30	□	MNS0660X30DB	232.2	235.2	288.2	287	1.2	7
6.7	5	★	MNS0670LB	57.2	57.2	110.2	109	1.2	7
	10	★	MNS0670X10DB	92.2	95.2	148.2	147	1.2	7
	20	★	MNS0670X20DB	162.2	165.2	218.2	217	1.2	7
	30	★	MNS0670X30DB	232.2	235.2	288.2	287	1.2	7

CUTTING CONDITIONS ➤ L135
HOW TO USE ➤ L137
TECHNICAL DATA ➤ N001

MNS/MNS...DB

Internal Coolant

DC (mm)	Hole Depth l/d	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
6.8	5	★	MNS0680LB	57.2	57.2	110.2	109	1.2	7
	10	□	MNS0680X10DB	92.2	95.2	148.2	147	1.2	7
	20	□	MNS0680X20DB	162.2	165.2	218.2	217	1.2	7
	30	□	MNS0680X30DB	232.2	235.2	288.2	287	1.2	7
6.9	5	★	MNS0690LB	57.3	57.3	110.3	109	1.3	7
	10	□	MNS0690X10DB	92.3	95.3	148.3	147	1.3	7
	20	□	MNS0690X20DB	162.3	165.3	218.3	217	1.3	7
	30	□	MNS0690X30DB	232.3	235.3	288.3	287	1.3	7
7.0	5	★	MNS0700LB	57.3	57.3	110.3	109	1.3	7
	10	★	MNS0700X10DB	92.3	95.3	148.3	147	1.3	7
	20	★	MNS0700X20DB	162.3	165.3	218.3	217	1.3	7
	30	★	MNS0700X30DB	232.3	235.3	288.3	287	1.3	7
7.1	5	★	MNS0710LB	61.3	65.3	119.3	118	1.3	8
	10	□	MNS0710X10DB	99.3	102.3	156.3	155	1.3	8
	20	□	MNS0710X20DB	174.3	177.3	231.3	230	1.3	8
	30	□	MNS0710X30DB	249.3	252.3	306.3	305	1.3	8
7.2	5	★	MNS0720LB	61.3	65.3	119.3	118	1.3	8
	10	★	MNS0720X10DB	99.3	102.3	156.3	155	1.3	8
	20	★	MNS0720X20DB	174.3	177.3	231.3	230	1.3	8
	30	★	MNS0720X30DB	249.3	252.3	306.3	305	1.3	8
7.3	5	★	MNS0730LB	61.3	65.3	119.3	118	1.3	8
	10	□	MNS0730X10DB	99.3	102.3	156.3	155	1.3	8
	20	□	MNS0730X20DB	174.3	177.3	231.3	230	1.3	8
	30	□	MNS0730X30DB	249.3	252.3	306.3	305	1.3	8
7.4	5	★	MNS0740LB	61.3	65.3	119.3	118	1.3	8
	10	□	MNS0740X10DB	99.3	102.3	156.3	155	1.3	8
	20	□	MNS0740X20DB	174.3	177.3	231.3	230	1.3	8
	30	□	MNS0740X30DB	249.3	252.3	306.3	305	1.3	8
7.5	5	★	MNS0750LB	61.4	65.4	119.4	118	1.4	8
	10	□	MNS0750X10DB	99.4	102.4	156.4	155	1.4	8
	20	□	MNS0750X20DB	174.4	177.4	231.4	230	1.4	8
	30	□	MNS0750X30DB	249.4	252.4	306.4	305	1.4	8
7.6	5	★	MNS0760LB	65.4	65.4	119.4	118	1.4	8
	10	□	MNS0760X10DB	105.4	108.4	162.4	161	1.4	8
	20	□	MNS0760X20DB	185.4	188.4	242.4	241	1.4	8
	30	□	MNS0760X30DB	265.4	268.4	322.4	321	1.4	8
7.7	5	★	MNS0770LB	65.4	65.4	119.4	118	1.4	8
	10	□	MNS0770X10DB	105.4	108.4	162.4	161	1.4	8
	20	□	MNS0770X20DB	185.4	188.4	242.4	241	1.4	8
	30	□	MNS0770X30DB	265.4	268.4	322.4	321	1.4	8
7.8	5	★	MNS0780LB	65.4	65.4	119.4	118	1.4	8
	10	★	MNS0780X10DB	105.4	108.4	162.4	161	1.4	8
	20	★	MNS0780X20DB	185.4	188.4	242.4	241	1.4	8
	30	★	MNS0780X30DB	265.4	268.4	322.4	321	1.4	8

Internal Coolant

DC (mm)	Hole Depth l/d	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
7.9	5	★	MNS0790LB	65.4	65.4	119.4	118	1.4	8
	10	□	MNS0790X10DB	105.4	108.4	162.4	161	1.4	8
	20	□	MNS0790X20DB	185.4	188.4	242.4	241	1.4	8
	30	□	MNS0790X30DB	265.4	268.4	322.4	321	1.4	8
8.0	5	★	MNS0800LB	65.5	65.5	119.5	118	1.5	8
	10	★	MNS0800X10DB	105.5	108.5	162.5	161	1.5	8
	20	★	MNS0800X20DB	185.5	188.5	242.5	241	1.5	8
	30	★	MNS0800X30DB	265.5	268.5	322.5	321	1.5	8
8.1	5	★	MNS0810LB	69.5	73.5	128.5	127	1.5	9
	10	□	MNS0810X10DB	112.5	115.5	170.5	169	1.5	9
	20	□	MNS0810X20DB	197.5	200.5	255.5	254	1.5	9
	30	□	MNS0810X30DB	282.5	285.5	340.5	339	1.5	9
8.2	5	★	MNS0820LB	69.5	73.5	128.5	127	1.5	9
	10	□	MNS0820X10DB	112.5	115.5	170.5	169	1.5	9
	20	□	MNS0820X20DB	197.5	200.5	255.5	254	1.5	9
	30	□	MNS0820X30DB	282.5	285.5	340.5	339	1.5	9
8.3	5	★	MNS0830LB	69.5	73.5	128.5	127	1.5	9
	10	□	MNS0830X10DB	112.5	115.5	170.5	169	1.5	9
	20	□	MNS0830X20DB	197.5	200.5	255.5	254	1.5	9
	30	□	MNS0830X30DB	282.5	285.5	340.5	339	1.5	9
8.4	5	★	MNS0840LB	69.5	73.5	128.5	127	1.5	9
	10	□	MNS0840X10DB	112.5	115.5	170.5	169	1.5	9
	20	□	MNS0840X20DB	197.5	200.5	255.5	254	1.5	9
	30	□	MNS0840X30DB	282.5	285.5	340.5	339	1.5	9
8.5	5	★	MNS0850LB	69.5	73.5	128.5	127	1.5	9
	10	□	MNS0850X10DB	112.5	115.5	170.5	169	1.5	9
	20	□	MNS0850X20DB	197.5	200.5	255.5	254	1.5	9
	30	□	MNS0850X30DB	282.5	285.5	340.5	339	1.5	9
8.6	5	★	MNS0860LB	73.6	73.6	128.6	127	1.6	9
	10	□	MNS0860X10DB	118.6	121.6	176.6	175	1.6	9
	20	□	MNS0860X20DB	208.6	211.6	266.6	265	1.6	9
	30	□	MNS0860X30DB	298.6	301.6	356.6	355	1.6	9
8.7	5	★	MNS0870LB	73.6	73.6	128.6	127	1.6	9
	10	□	MNS0870X10DB	118.6	121.6	176.6	175	1.6	9
	20	□	MNS0870X20DB	208.6	211.6	266.6	265	1.6	9
	30	□	MNS0870X30DB	298.6	301.6	356.6	355	1.6	9
8.8	5	★	MNS0880LB	73.6	73.6	128.6	127	1.6	9
	10	□	MNS0880X10DB	118.6	121.6	176.6	175	1.6	9
	20	□	MNS0880X20DB	208.6	211.6	266.6	265	1.6	9
	30	□	MNS0880X30DB	298.6	301.6	356.6	355	1.6	9
8.9	5	★	MNS0890LB	73.6	73.6	128.6	127	1.6	9
	10	□	MNS0890X10DB	118.6	121.6	176.6	175	1.6	9
	20	□	MNS0890X20DB	208.6	211.6	266.6	265	1.6	9
	30	□	MNS0890X30DB	298.6	301.6	356.6	355	1.6	9

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

Internal Coolant

DC (mm)	Hole Depth l/d	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
9.0	5	★	MNS0900LB	73.6	73.6	128.6	127	1.6	9
	10	★	MNS0900X10DB	118.6	121.6	176.6	175	1.6	9
	20	★	MNS0900X20DB	208.6	211.6	266.6	265	1.6	9
	30	★	MNS0900X30DB	298.6	301.6	356.6	355	1.6	9
9.1	5	★	MNS0910LB	77.7	81.7	137.7	136	1.7	10
	10	□	MNS0910X10DB	125.7	128.7	183.7	182	1.7	10
	20	□	MNS0910X20DB	220.7	223.7	278.7	277	1.7	10
	30	□	MNS0910X30DB	315.7	318.7	373.7	372	1.7	10
9.2	5	★	MNS0920LB	77.7	81.7	137.7	136	1.7	10
	10	□	MNS0920X10DB	125.7	128.7	183.7	182	1.7	10
	20	□	MNS0920X20DB	220.7	223.7	278.7	277	1.7	10
	30	□	MNS0920X30DB	315.7	318.7	373.7	372	1.7	10
9.3	5	★	MNS0930LB	77.7	81.7	137.7	136	1.7	10
	10	□	MNS0930X10DB	125.7	128.7	183.7	182	1.7	10
	20	□	MNS0930X20DB	220.7	223.7	278.7	277	1.7	10
	30	□	MNS0930X30DB	315.7	318.7	373.7	372	1.7	10
9.4	5	★	MNS0940LB	77.7	81.7	137.7	136	1.7	10
	10	□	MNS0940X10DB	125.7	128.7	183.7	182	1.7	10
	20	□	MNS0940X20DB	220.7	223.7	278.7	277	1.7	10
	30	□	MNS0940X30DB	315.7	318.7	373.7	372	1.7	10
9.5	5	★	MNS0950LB	77.7	81.7	137.7	136	1.7	10
	10	□	MNS0950X10DB	125.7	128.7	183.7	182	1.7	10
	20	□	MNS0950X20DB	220.7	223.7	278.7	277	1.7	10
	30	□	MNS0950X30DB	315.7	318.7	373.7	372	1.7	10
9.6	5	★	MNS0960LB	81.7	81.7	137.7	136	1.7	10
	10	□	MNS0960X10DB	131.7	134.7	189.7	188	1.7	10
	20	□	MNS0960X20DB	231.7	234.7	289.7	288	1.7	10
	30	□	MNS0960X30DB	331.7	334.7	389.7	388	1.7	10
9.7	5	★	MNS0970LB	81.8	81.8	137.8	136	1.8	10
	10	□	MNS0970X10DB	131.8	134.8	189.8	188	1.8	10
	20	□	MNS0970X20DB	231.8	234.8	289.8	288	1.8	10
	30	□	MNS0970X30DB	331.8	334.8	389.8	388	1.8	10
9.8	5	★	MNS0980LB	81.8	81.8	137.8	136	1.8	10
	10	★	MNS0980X10DB	131.8	134.8	189.8	188	1.8	10
	20	★	MNS0980X20DB	231.8	234.8	289.8	288	1.8	10
	30	★	MNS0980X30DB	331.8	334.8	389.8	388	1.8	10
9.9	5	★	MNS0990LB	81.8	81.8	137.8	136	1.8	10
	10	□	MNS0990X10DB	131.8	134.8	189.8	188	1.8	10
	20	□	MNS0990X20DB	231.8	234.8	289.8	288	1.8	10
	30	□	MNS0990X30DB	331.8	334.8	389.8	388	1.8	10
10.0	5	★	MNS1000LB	81.8	81.8	137.8	136	1.8	10
	10	★	MNS1000X10DB	131.8	134.8	189.8	188	1.8	10
	20	★	MNS1000X20DB	231.8	234.8	289.8	288	1.8	10
	30	★	MNS1000X30DB	331.8	334.8	389.8	388	1.8	10

Internal Coolant

DC (mm)	Hole Depth l/d	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
10.1	5	★	MNS1010LB	85.8	89.8	150.8	149	1.8	11
	10	□	MNS1010X10DB	138.8	141.8	202.8	201	1.8	11
	20	□	MNS1010X20DB	243.8	246.8	307.8	306	1.8	11
10.2	5	★	MNS1020LB	85.9	89.9	150.9	149	1.9	11
	10	□	MNS1020X10DB	138.9	141.9	202.9	201	1.9	11
	20	□	MNS1020X20DB	243.9	246.9	307.9	306	1.9	11
10.3	5	★	MNS1030LB	85.9	89.9	150.9	149	1.9	11
	10	□	MNS1030X10DB	138.9	141.9	202.9	201	1.9	11
	20	□	MNS1030X20DB	243.9	246.9	307.9	306	1.9	11
10.4	5	★	MNS1040LB	85.9	89.9	150.9	149	1.9	11
	10	□	MNS1040X10DB	138.9	141.9	202.9	201	1.9	11
	20	□	MNS1040X20DB	243.9	246.9	307.9	306	1.9	11
10.5	5	★	MNS1050LB	85.9	89.9	150.9	149	1.9	11
	10	★	MNS1050X10DB	138.9	141.9	202.9	201	1.9	11
	20	★	MNS1050X20DB	243.9	246.9	307.9	306	1.9	11
10.6	5	★	MNS1060LB	89.9	89.9	150.9	149	1.9	11
	10	□	MNS1060X10DB	144.9	147.9	208.9	207	1.9	11
	20	□	MNS1060X20DB	254.9	257.9	318.9	317	1.9	11
10.7	5	★	MNS1070LB	89.9	89.9	150.9	149	1.9	11
	10	□	MNS1070X10DB	144.9	147.9	208.9	207	1.9	11
	20	□	MNS1070X20DB	254.9	257.9	318.9	317	1.9	11
10.8	5	★	MNS1080LB	90.0	90.0	151.0	149	2.0	11
	10	□	MNS1080X10DB	145.0	148.0	209.0	207	2.0	11
	20	□	MNS1080X20DB	255.0	258.0	319.0	317	2.0	11
10.9	5	★	MNS1090LB	90.0	90.0	151.0	149	2.0	11
	10	□	MNS1090X10DB	145.0	148.0	209.0	207	2.0	11
	20	□	MNS1090X20DB	255.0	258.0	319.0	317	2.0	11
11.0	5	★	MNS1100LB	90.0	90.0	151.0	149	2.0	11
	10	★	MNS1100X10DB	145.0	148.0	209.0	207	2.0	11
	20	★	MNS1100X20DB	255.0	258.0	319.0	317	2.0	11
11.1	5	★	MNS1110LB	94.0	98.0	160.0	158	2.0	12
	10	□	MNS1110X10DB	152.0	155.0	217.0	215	2.0	12
	20	□	MNS1110X20DB	267.0	270.0	332.0	330	2.0	12
11.2	5	★	MNS1120LB	94.0	98.0	160.0	158	2.0	12
	10	□	MNS1120X10DB	152.0	155.0	217.0	215	2.0	12
	20	□	MNS1120X20DB	267.0	270.0	332.0	330	2.0	12
11.3	5	★	MNS1130LB	94.1	98.1	160.1	158	2.1	12
	10	□	MNS1130X10DB	152.1	155.1	217.1	215	2.1	12
	20	□	MNS1130X20DB	267.1	270.1	332.1	330	2.1	12
11.4	5	★	MNS1140LB	94.1	98.1	160.1	158	2.1	12
	10	□	MNS1140X10DB	152.1	155.1	217.1	215	2.1	12
	20	□	MNS1140X20DB	267.1	270.1	332.1	330	2.1	12
11.5	5	★	MNS1150LB	94.1	98.1	160.1	158	2.1	12
	10	□	MNS1150X10DB	152.1	155.1	217.1	215	2.1	12
	20	□	MNS1150X20DB	267.1	270.1	332.1	330	2.1	12

CUTTING CONDITIONS ➤ L135
HOW TO USE ➤ L137
TECHNICAL DATA ➤ N001

MNS/MNS...DB

Internal Coolant

DC (mm)	Hole Depth l/d	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
	5	★	MNS1160LB	98.1	98.1	160.1	158	2.1	12
11.6	10	□	MNS1160X10DB	158.1	161.1	223.1	221	2.1	12
	20	□	MNS1160X20DB	278.1	281.1	343.1	341	2.1	12
	5	★	MNS1170LB	98.1	98.1	160.1	158	2.1	12
11.7	10	□	MNS1170X10DB	158.1	161.1	223.1	221	2.1	12
	20	□	MNS1170X20DB	278.1	281.1	343.1	341	2.1	12
	5	★	MNS1180LB	98.1	98.1	160.1	158	2.1	12
11.8	10	□	MNS1180X10DB	158.1	161.1	223.1	221	2.1	12
	20	□	MNS1180X20DB	278.1	281.1	343.1	341	2.1	12
	5	★	MNS1190LB	98.2	98.2	160.2	158	2.2	12
11.9	10	□	MNS1190X10DB	158.2	161.2	223.2	221	2.2	12
	20	□	MNS1190X20DB	278.2	281.2	343.2	341	2.2	12
	5	★	MNS1200LB	98.2	98.2	160.2	158	2.2	12
12.0	10	★	MNS1200X10DB	158.2	161.2	223.2	221	2.2	12
	20	★	MNS1200X20DB	278.2	281.2	343.2	341	2.2	12
	5	★	MNS1210LB	102.2	106.2	169.2	167	2.2	13
12.1	10	□	MNS1210X10DB	165.2	168.2	231.2	229	2.2	13
	20	□	MNS1210X20DB	290.2	293.2	356.2	354	2.2	13
	5	★	MNS1220LB	102.2	106.2	169.2	167	2.2	13
12.2	10	□	MNS1220X10DB	165.2	168.2	231.2	229	2.2	13
	20	□	MNS1220X20DB	290.2	293.2	356.2	354	2.2	13
	5	★	MNS1230LB	102.2	106.2	169.2	167	2.2	13
12.3	10	□	MNS1230X10DB	165.2	168.2	231.2	229	2.2	13
	20	□	MNS1230X20DB	290.2	293.2	356.2	354	2.2	13
	5	★	MNS1240LB	102.3	106.3	169.3	167	2.3	13
12.4	10	□	MNS1240X10DB	165.3	168.3	231.3	229	2.3	13
	20	□	MNS1240X20DB	290.3	293.3	356.3	354	2.3	13
	5	★	MNS1250LB	102.3	106.3	169.3	167	2.3	13
12.5	10	□	MNS1250X10DB	165.3	168.3	231.3	229	2.3	13
	20	□	MNS1250X20DB	290.3	293.3	356.3	354	2.3	13
	5	★	MNS1260LB	106.3	106.3	169.3	167	2.3	13
12.6	10	□	MNS1260X10DB	171.3	174.3	237.3	235	2.3	13
	20	□	MNS1260X20DB	301.3	304.3	367.3	365	2.3	13
	5	★	MNS1270LB	106.3	106.3	169.3	167	2.3	13
12.7	10	□	MNS1270X10DB	171.3	174.3	237.3	235	2.3	13
	20	□	MNS1270X20DB	301.3	304.3	367.3	365	2.3	13
	5	★	MNS1280LB	106.3	106.3	169.3	167	2.3	13
12.8	10	□	MNS1280X10DB	171.3	174.3	237.3	235	2.3	13
	20	□	MNS1280X20DB	301.3	304.3	367.3	365	2.3	13
	5	★	MNS1290LB	106.3	106.3	169.3	167	2.3	13
12.9	10	□	MNS1290X10DB	171.3	174.3	237.3	235	2.3	13
	20	□	MNS1290X20DB	301.3	304.3	367.3	365	2.3	13
	5	★	MNS1300LB	106.4	106.4	169.4	167	2.4	13
13.0	10	★	MNS1300X10DB	171.4	174.4	237.4	235	2.4	13
	20	★	MNS1300X20DB	301.4	304.4	367.4	365	2.4	13

Internal Coolant

DC (mm)	Hole Depth l/d	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
	5	★	MNS1310LB	110.4	114.4	178.4	176	2.4	14
13.1	10	□	MNS1310X10DB	178.4	181.4	245.4	243	2.4	14
	20	□	MNS1310X20DB	313.4	316.4	380.4	378	2.4	14
	5	★	MNS1320LB	110.4	114.4	178.4	176	2.4	14
13.2	10	□	MNS1320X10DB	178.4	181.4	245.4	243	2.4	14
	20	□	MNS1320X20DB	313.4	316.4	380.4	378	2.4	14
	5	★	MNS1330LB	110.4	114.4	178.4	176	2.4	14
13.3	10	□	MNS1330X10DB	178.4	181.4	245.4	243	2.4	14
	20	□	MNS1330X20DB	313.4	316.4	380.4	378	2.4	14
	5	★	MNS1340LB	110.4	114.4	178.4	176	2.4	14
13.4	10	□	MNS1340X10DB	178.4	181.4	245.4	243	2.4	14
	20	□	MNS1340X20DB	313.4	316.4	380.4	378	2.4	14
	5	★	MNS1350LB	110.5	114.5	178.5	176	2.5	14
13.5	10	□	MNS1350X10DB	178.5	181.5	245.5	243	2.5	14
	20	□	MNS1350X20DB	313.5	316.5	380.5	378	2.5	14
	5	★	MNS1360LB	114.5	114.5	178.5	176	2.5	14
13.6	10	□	MNS1360X10DB	184.5	187.5	251.5	249	2.5	14
	20	□	MNS1360X20DB	324.5	327.5	391.5	389	2.5	14
	5	★	MNS1370LB	114.5	114.5	178.5	176	2.5	14
13.7	10	□	MNS1370X10DB	184.5	187.5	251.5	249	2.5	14
	20	□	MNS1370X20DB	324.5	327.5	391.5	389	2.5	14
	5	★	MNS1380LB	114.5	114.5	178.5	176	2.5	14
13.8	10	□	MNS1380X10DB	184.5	187.5	251.5	249	2.5	14
	20	□	MNS1380X20DB	324.5	327.5	391.5	389	2.5	14
	5	★	MNS1390LB	114.5	114.5	178.5	176	2.5	14
13.9	10	□	MNS1390X10DB	184.5	187.5	251.5	249	2.5	14
	20	□	MNS1390X20DB	324.5	327.5	391.5	389	2.5	14
	5	★	MNS1400LB	114.5	114.5	178.5	176	2.5	14
14.0	10	★	MNS1400X10DB	184.5	187.5	251.5	249	2.5	14
	20	★	MNS1400X20DB	324.5	327.5	391.5	389	2.5	14

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

RECOMMENDED CUTTING CONDITIONS

LB Type

Work Material		Aluminium Alloy (Si<5%) AISI A6061, A7075 etc.		Austenitic Stainless Steel (5%≤Si≤10%) ASTM 333.0 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.1181	3.0	395 (310—460)	.0039 (.0043—.0063)	395 (310—460)	.0059 (.0063—.0083)
.1575	4.0	395 (310—460)	.0059 (.0051—.0079)	395 (310—460)	.0079 (.0079—.0106)
.1969	5.0	395 (310—460)	.0079 (.0067—.0098)	395 (310—460)	.0098 (.0098—.0130)
.2480	6.3	490 (395—560)	.0098 (.0083—.0126)	490 (395—560)	.0138 (.0126—.0165)
.3150	8.0	490 (395—560)	.0118 (.0106—.0157)	490 (395—560)	.0177 (.0157—.0209)
.3937	10.0	490 (395—560)	.0157 (.0130—.0197)	490 (395—560)	.0217 (.0197—.0264)
.4724	12.0	655 (525—755)	.0197 (.0157—.0236)	655 (525—755)	.0276 (.0236—.0315)
.5512	14.0	655 (525—755)	.0197 (.0157—.0236)	655 (525—755)	.0276 (.0236—.0315)

Work Material		Aluminium Alloy (Si>10%) ASTM 380.0, A390.0 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm		
.1181	3.0	395 (310—460)	.0059 (.0063—.0083)
.1575	4.0	395 (310—460)	.0079 (.0079—.0106)
.1969	5.0	395 (310—460)	.0098 (.0098—.0130)
.2480	6.3	490 (395—560)	.0138 (.0126—.0165)
.3150	8.0	490 (395—560)	.0177 (.0157—.0209)
.3937	10.0	490 (395—560)	.0217 (.0197—.0264)
.4724	12.0	655 (525—755)	.0276 (.0236—.0315)
.5512	14.0	655 (525—755)	.0276 (.0236—.0315)

(Note 1) When using the drill with a length over l/d 10, it is necessary to use a prep hole as the pilot. (If no prep-hole is used then drill breakage can occur)

(Note 2) For pilot hole drilling, Mitsubishi Materials MNS-LB, MAE-MB or MAS-MB drill is recommended.

HOW TO USE ➤ L137
TECHNICAL DATA ➤ N001

MNS/MNS...DB

DB Type

Work Material		Aluminium Alloy (Si<5%) AISI A6061, A7075 etc.		Austenitic Stainless Steel (5%≤Si≤10%) ASTM 333.0 etc.	
Drill Dia. **DC** inch	Drill Dia. **DC** mm	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
.1181	3.0	295 (230—330)	.0039 (.0043—.0063)	295 (230—330)	.0059 (.0063—.0083)
.1575	4.0	295 (230—330)	.0059 (.0051—.0079)	295 (230—330)	.0079 (.0079—.0106)
.1969	5.0	295 (230—330)	.0079 (.0067—.0098)	295 (230—330)	.0098 (.0098—.0130)
.2480	6.3	395 (310—460)	.0098 (.0083—.0126)	395 (310—460)	.0138 (.0126—.0165)
.3150	8.0	395 (310—460)	.0118 (.0106—.0157)	395 (310—460)	.0177 (.0157—.0209)
.3937	10.0	395 (310—460)	.0157 (.0130—.0197)	395 (310—460)	.0217 (.0197—.0264)
.4724	12.0	525 (410—590)	.0197 (.0157—.0236)	525 (410—590)	.0276 (.0236—.0315)
.5512	14.0	525 (410—590)	.0197 (.0157—.0236)	525 (410—590)	.0276 (.0236—.0315)

Work Material		Aluminium Alloy (Si>10%) ASTM 383.0, A390.0 etc.	
Drill Dia. **DC** inch	Drill Dia. **DC** mm	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
.1181	3.0	295 (230—330)	.0059 (.0063—.0083)
.1575	4.0	295 (230—330)	.0079 (.0079—.0106)
.1969	5.0	295 (230—330)	.0098 (.0098—.0130)
.2480	6.3	395 (310—460)	.0138 (.0126—.0165)
.3150	8.0	395 (310—460)	.0177 (.0157—.0209)
.3937	10.0	395 (310—460)	.0217 (.0197—.0264)
.4724	12.0	525 (410—590)	.0276 (.0236—.0315)
.5512	14.0	525 (410—590)	.0276 (.0236—.0315)

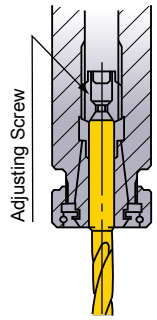
(Note 1) When using the drill with a length over l/d 10, it is necessary to use a prep hole as the pilot. (If no prep-hole is used then drill breakage can occur)

(Note 2) For pilot hole drilling, Mitsubishi Materials MNS-LB, MAE-MB or MAS-MB drill is recommended.

(Note 3) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

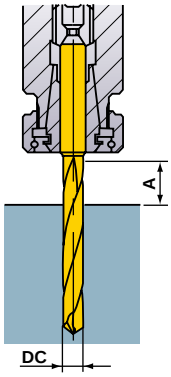
OPERATIONAL GUIDANCE FOR THE MNS...LB DRILL

Drill Holding



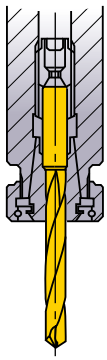
Thrust bearing type collet chuck holds the drill securely.

Drill Length



A ≥ DC x 1.5

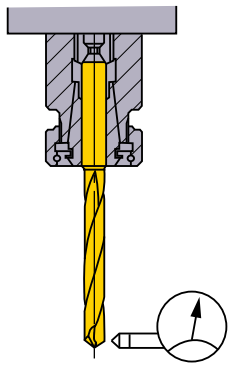
Drill Installation



NG

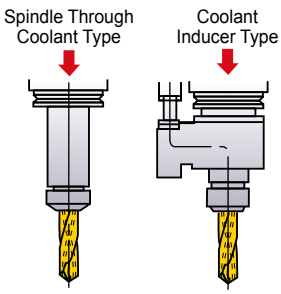
Do not clamp on the flutes.

Installation Tolerance



Runout ≤ .001″

Through Coolant Type



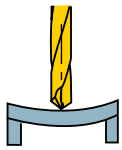
Recommended coolant pressure: 70 - 1015 PSI (0.5 - 7MPa).

Coolant Handling

1) Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure.

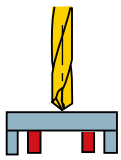
2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

Thin Workpiece



If Bending Occurs

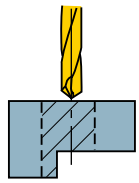
NG



Support the Workpiece

Good

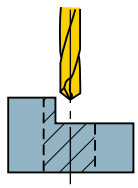
Interrupted Cutting



One process

Good

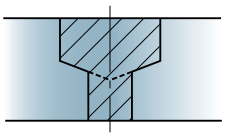
①Lower the feed when drilling the interrupted part.



Requires prior machining

①Spot face with an end mill prior to drilling.

Stepped Holes

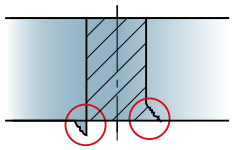


①Divide the machining into two processes.

②Drill the larger hole first.

★Tools for chamfering and spot facing can be produced to order.

Burring and Workpiece Chipping



①Lower the feed rate when breaking through.

②Add a chamfer.

③Change the point angle.

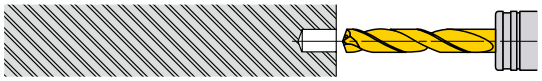
MNS...DB

OPERATIONAL GUIDANCE FOR THE MNS...DB DRILL

FLAT FACE DRILLING

●Drilling a blind hole

1. Drilling a pilot hole



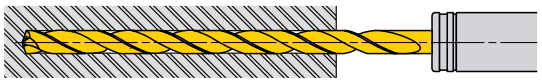
①Use a drill with the same or larger point angle than the MNS...DB type. Mitsubishi type MNS-LB, MAE-MB or MAS-MB drill is recommended.
②Ensure a high precision hole is drilled for the pilot.
③Drill depth : Approx 1DC or deeper.
(Adjust the pilot hole depth according to the length of the MNS...DB type.)

2. Initial cutting with the long type drill



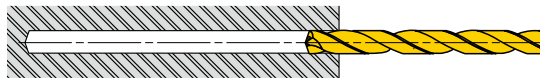
①Penetrate the pilot hole at a low revolution. (Cutting speed 65-100 SFM, feed rate .008-.012 IPR)
②Stop the long type drill .039-.118 inch short of the pilot hole bottom.

3. Drill the deep hole



①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

4. Drill retraction

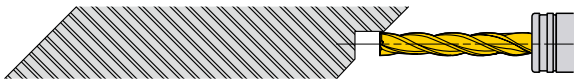


①After drilling, lower the cutting revolution about .039-.079 inch short of the hole end. (Cutting speed of around 65-100 SFM)
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 inch/min.
③Finally clear the hole at a cutting speed of 65-100 SFM and feed rate of .008-.012 IPR.

IRREGULAR FACE DRILLING

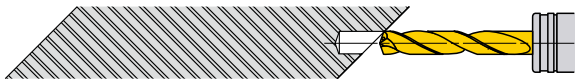
●Drilling and breaking through on irregular faces or angles

1. Spot facing



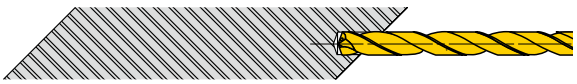
①Machine a flat on the irregular face by using an end mill or drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



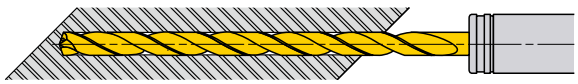
①Use a drill with the same or larger point angle than the super long type. Mitsubishi type MNS-LB, MAE-MB or MAS-MB drill is recommended.
②Ensure a high precision hole is drilled for the pilot.
③Drill depth : Approx 1DC or deeper.
(Adjust the pilot hole depth according to the length of the super long type.)

3. Initial cutting with the long type drill



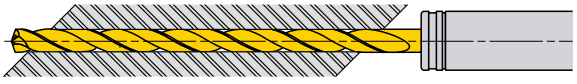
①Penetrate the pilot hole at a low revolution. (Cutting speed 65-100 SFM, feed rate .008-.012 IPR)
②Stop the long type drill .039-.118 inch short of the pilot hole bottom.

4. Drill the deep hole



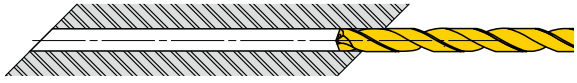
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

5. Breaking through



①When breaking through, the cutting edge can be damaged.
②A feed rate of .002-.004 IPR is recommended.

6. Drill retraction



①Finally clear the hole at a cutting speed of 65-100 SFM.
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 inch/min.

Memo

MAS

- Specialized in aluminum and cast iron drilling.
- High hole accuracy.
- Pre-hole drilling for rolled tap.
- Helical coolant hole enables high speed machining.

P | M | **K** | **N** | S | H

Tolerance	.1250≤DC≤.2344	.2500≤DC≤.3906	.4062≤DC≤.7031	.7188≤DC≤.7812
DC (inch)	+0.00020 0	+0.00020 0	+0.00020 0	+0.00020 0
DCON (inch)	0 −0.00031	0 −0.00035	0 −0.00043	0 −0.00051

INCH STANDARD

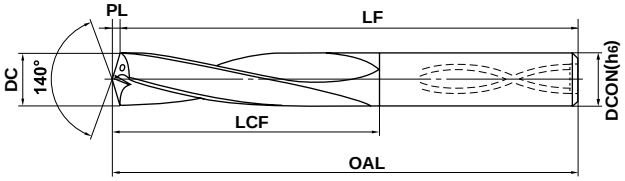
L/D=3

Internal Coolant









(Note 1) MAS type larger than ϕ.2031" have a recess in the shank end face.
(Note 2) MAS type can be used for shrink fit holders.

Helix Angle : 10°

DC (inch)	Order Number	Stock HTi10	Dimensions (inch) LCF	OAL	LF	PL	DCON	Rolled Thread Tap Size
.1250	MAS01250MB	●	.968	2.543	2.520	.023	.1575	
.1406	MAS01406MB	●	1.128	2.703	2.677	.026	.1575	
.1495	MAS01495MB	●	1.129	2.704	2.677	.027	.1575	10-24NC
.1563	MAS01563MB	●	1.130	2.705	2.677	.028	.1575	
.1590	MAS01590MB	●	1.249	2.824	2.795	.029	.1969	10-32NF
.1719	MAS01719MB	●	1.251	2.826	2.795	.031	.1969	
.1875	MAS01875MB	●	1.333	2.908	2.874	.034	.1969	
.2031	MAS02031MB	●	1.454	3.029	2.992	.037	.2362	
.2165	MAS02165MB	●	1.456	3.031	2.992	.039	.2362	
.2188	MAS02188MB	●	1.575	3.150	3.110	.040	.2362	
.2344	MAS02344MB	●	1.578	3.153	3.110	.043	.2362	
.2500	MAS02500MB	●	1.700	3.353	3.307	.046	.2756	1/16-27NS
.2570	MAS02570MB	●	1.701	3.354	3.307	.047	.2756	5/16-18NC
.2656	MAS02656MB	●	1.702	3.355	3.307	.048	.2756	
.2720	MAS02720MB	●	1.704	3.357	3.307	.050	.2756	5/16-24NF
.2812	MAS02812MB	●	1.941	3.594	3.543	.051	.3150	
.2969	MAS02969MB	●	1.944	3.597	3.543	.054	.3150	
.3125	MAS03125MB	●	1.947	3.600	3.543	.057	.3150	3/8-16NC
.3281	MAS03281MB	●	2.029	3.761	3.701	.060	.3543	1/8-27NPT
.3320	MAS03320MB	●	2.029	3.761	3.701	.060	.3543	3/8-24NF
.3438	MAS03438MB	●	2.032	3.764	3.701	.063	.3543	
.3594	MAS03594MB	●	2.152	3.884	3.819	.065	.3937	
.3680	MAS03680MB	●	2.154	3.886	3.819	.067	.3937	7/16-14NC
.3750	MAS03750MB	●	2.155	3.887	3.819	.068	.3937	
.3906	MAS03906MB	●	2.158	3.890	3.819	.071	.3937	7/16-20NF
.4062	MAS04062MB	●	2.239	4.050	3.976	.074	.4331	

DC (inch)	Order Number	Stock HTi10	Dimensions (inch) LCF	OAL	LF	PL	DCON	Rolled Thread Tap Size
.4219	MAS04219MB	●	2.242	4.053	3.976	.077	.4331	1/2-13, 1/2-12
.4375	MAS04375MB	●	2.442	4.253	4.173	.080	.4724	1/4-18NPT
.4531	MAS04531MB	●	2.444	4.255	4.173	.082	.4724	1/2-20, 1/4-18NS
.4688	MAS04688MB	●	2.447	4.258	4.173	.085	.4724	
.4844	MAS04844MB	●	2.647	4.616	4.528	.088	.5118	9/16-12NC
.5000	MAS05000MB	●	2.650	4.619	4.528	.091	.5118	
.5118	MAS05118MB	●	2.652	4.621	4.528	.093	.5118	
.5156	MAS05156MB	●	2.850	4.818	4.724	.094	.5512	9/16-18NF
.5312	MAS05312MB	●	2.853	4.821	4.724	.097	.5512	5/8-11NC
.5469	MAS05469MB	●	2.856	4.824	4.724	.100	.5512	
.5625	MAS05625MB	●	2.937	5.220	5.118	.102	.5906	3/8-18NPT
.5781	MAS05781MB	●	2.940	5.223	5.118	.105	.5906	5/8-18NF
.5937	MAS05937MB	●	3.100	5.384	5.276	.108	.6299	3/8-18NS
.6094	MAS06094MB	●	3.103	5.387	5.276	.111	.6299	
.6250	MAS06250MB	●	3.106	5.390	5.276	.114	.6299	
.6406	MAS06406MB	●	3.267	5.550	5.433	.117	.6693	
.6563	MAS06563MB	●	3.269	5.552	5.433	.119	.6693	3/4-10NC
.6718	MAS06718MB	●	3.468	5.752	5.630	.122	.7087	
.6875	MAS06875MB	●	3.471	5.755	5.630	.125	.7087	3/4-16NF
.7031	MAS07031MB	●	3.474	5.758	5.630	.128	.7087	1/2-14NPT
.7188	MAS07188MB	●	3.674	5.958	5.827	.131	.7480	
.7344	MAS07344MB	●	3.677	5.961	5.827	.134	.7480	7/8-9, 1/2-14NS
.7500	MAS07500MB	●	3.877	6.161	6.024	.137	.7874	
.7656	MAS07656MB	●	3.879	6.163	6.024	.139	.7874	
.7812	MAS07812MB	●	3.882	6.166	6.024	.142	.7874	

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained.

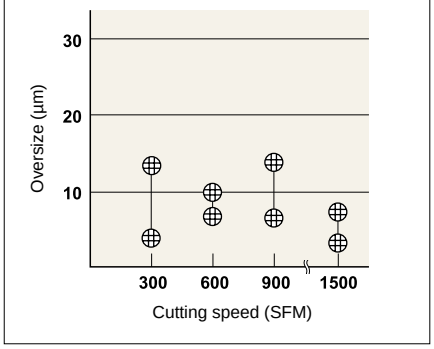
RECOMMENDED CUTTING CONDITIONS

	Work Material	Drill Dia. **ϕ.1250" – ϕ.2344"**		Drill Dia. **ϕ.2500" – ϕ.3906"**		Drill Dia. **ϕ.4062" – ϕ.7812"**	
		Cutting Speed (SFM)	Feed (IPR)	Cutting Speed (SFM)	Feed (IPR)	Cutting Speed (SFM)	Feed (IPR)
N	Aluminum Alloy Casting	330 (195—490)	.006 (.002—.012)	390 (260—555)	.008 (.004—.012)	490 (330—655)	.010 (.004—.016)
N	Aluminum Alloy Die Casting	390 (260—555)	.005 (.002—.010)	490 (330—590)	.006 (.002—.010)	525 (390—655)	.008 (.004—.012)
K	Gray Cast Iron	195 (130—260)	.006 (.004—.008)	260 (195—360)	.008 (.004—.012)	330 (230—425)	.012 (.008—.016)
K	Ductile Cast Iron	145 (100—195)	.004 (.002—.006)	195 (130—260)	.005 (.002—.008)	260 (195—330)	.008 (.004—.012)

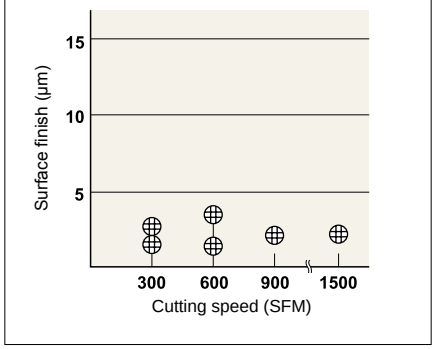
MACHINED HOLE ACCURACY

Tool : MAS1000LB Workpiece : 330 Aluminum Feed : .008 inch/rev Drilled Depth : 2.36 inch (Through hole) WSO (10%)

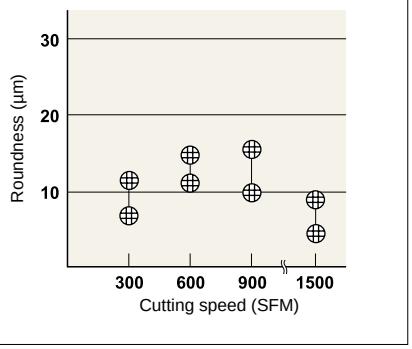
Oversize



Surface Roughness



Roundness



MAE/MAS

- Specialized in aluminum and cast iron drilling.
- High hole accuracy.
- Pre-hole drilling for rolled tap.
- Helical coolant hole enables high speed machining.

P | M | **K** | **N** | S | H

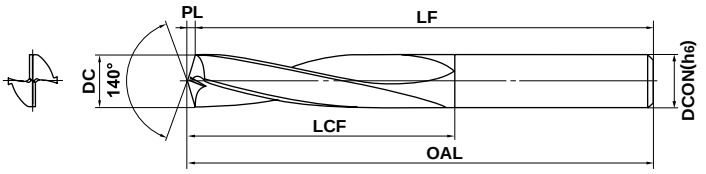
Tolerance	DC=3	3<DC≤6	6<DC≤10	10<DC≤16
DC (mm)	+0.005 0	+0.005 0	+0.005 0	+0.005 0
DCON (mm)	0 −0.006	0 −0.007	0 −0.009	0 −0.011

METRIC STANDARD

MAE (External Coolant)



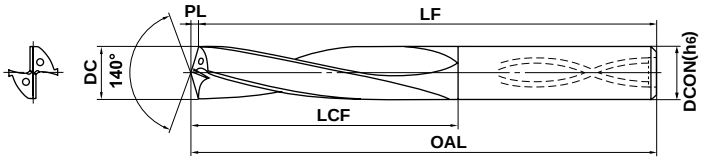




MAS (Internal Coolant)







(Note 1) MAS type larger than ϕ5.0 have a recess in the shank end face.
(Note 2) MAE/MAS type can be used for shrink fit holders.

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON
3.0	3	Ext.	★	MAE0300MB	21.5	61.5	61	0.5	3
	3	Int.	□	MAS0300MB	21.5	61.5	61	0.5	3
	6	Int.	★	MAS0300LB	30.5	70.5	70	0.5	3
3.1	3	Ext.	★	MAE0310MB	24.6	64.6	64	0.6	4
	3	Int.	□	MAS0310MB	24.6	64.6	64	0.6	4
	6	Int.	★	MAS0310LB	34.6	74.6	74	0.6	4
3.2	3	Ext.	★	MAE0320MB	24.6	64.6	64	0.6	4
	3	Int.	□	MAS0320MB	24.6	64.6	64	0.6	4
	6	Int.	★	MAS0320LB	34.6	74.6	74	0.6	4
3.3	3	Ext.	★	MAE0330MB	24.6	64.6	64	0.6	4
	3	Int.	□	MAS0330MB	24.6	64.6	64	0.6	4
	6	Int.	★	MAS0330LB	34.6	74.6	74	0.6	4
3.4	3	Ext.	★	MAE0340MB	24.6	64.6	64	0.6	4
	3	Int.	□	MAS0340MB	24.6	64.6	64	0.6	4
	6	Int.	★	MAS0340LB	34.6	74.6	74	0.6	4
3.5	3	Ext.	★	MAE0350MB	24.6	64.6	64	0.6	4
	3	Int.	□	MAS0350MB	24.6	64.6	64	0.6	4
	6	Int.	★	MAS0350LB	34.6	74.6	74	0.6	4
3.6	3	Ext.	★	MAE0360MB	28.7	68.7	68	0.7	4
	3	Int.	□	MAS0360MB	28.7	68.7	68	0.7	4
	6	Int.	★	MAS0360LB	40.7	80.7	80	0.7	4
3.65	3	Ext.	★	⁎ MAE0365MB	28.7	68.7	68	0.7	4
	3	Int.	□	⁎ MAS0365MB	28.7	68.7	68	0.7	4
	6	Int.	★	⁎ MAS0365LB	40.7	80.7	80	0.7	4
3.7	3	Ext.	★	MAE0370MB	28.7	68.7	68	0.7	4
	3	Int.	□	MAS0370MB	28.7	68.7	68	0.7	4
	6	Int.	★	MAS0370LB	40.7	80.7	80	0.7	4
3.8	3	Ext.	★	MAE0380MB	28.7	68.7	68	0.7	4
	3	Int.	□	MAS0380MB	28.7	68.7	68	0.7	4
	6	Int.	★	MAS0380LB	40.7	80.7	80	0.7	4
3.9	3	Ext.	★	MAE0390MB	28.7	68.7	68	0.7	4
	3	Int.	□	MAS0390MB	28.7	68.7	68	0.7	4
	6	Int.	★	MAS0390LB	40.7	80.7	80	0.7	4
4.0	3	Ext.	★	MAE0400MB	28.7	68.7	68	0.7	4
	3	Int.	□	MAS0400MB	28.7	68.7	68	0.7	4
	6	Int.	★	MAS0400LB	40.7	80.7	80	0.7	4
4.1	3	Ext.	★	MAE0410MB	31.7	71.7	71	0.7	5
	3	Int.	□	MAS0410MB	31.7	71.7	71	0.7	5
	6	Int.	★	MAS0410LB	44.7	84.7	84	0.7	5
4.2	3	Ext.	★	MAE0420MB	31.8	71.8	71	0.8	5
	3	Int.	□	MAS0420MB	31.8	71.8	71	0.8	5
	6	Int.	★	MAS0420LB	44.8	84.8	84	0.8	5
4.3	3	Ext.	★	MAE0430MB	31.8	71.8	71	0.8	5
	3	Int.	□	MAS0430MB	31.8	71.8	71	0.8	5
	6	Int.	★	MAS0430LB	44.8	84.8	84	0.8	5
4.4	3	Ext.	★	MAE0440MB	31.8	71.8	71	0.8	5
	3	Int.	□	MAS0440MB	31.8	71.8	71	0.8	5
	6	Int.	★	MAS0440LB	44.8	84.8	84	0.8	5
4.5	3	Ext.	★	MAE0450MB	31.8	71.8	71	0.8	5
	3	Int.	□	MAS0450MB	31.8	71.8	71	0.8	5
	6	Int.	★	MAS0450LB	44.8	84.8	84	0.8	5
4.6	3	Ext.	★	⁎ MAE0460MB	33.8	73.8	73	0.8	5
	3	Int.	□	⁎ MAS0460MB	33.8	73.8	73	0.8	5
	6	Int.	★	⁎ MAS0460LB	48.8	88.8	88	0.8	5
4.7	3	Ext.	★	MAE0470MB	33.9	73.9	73	0.9	5
	3	Int.	□	MAS0470MB	33.9	73.9	73	0.9	5
	6	Int.	★	MAS0470LB	48.9	88.9	88	0.9	5
4.8	3	Ext.	★	MAE0480MB	33.9	73.9	73	0.9	5
	3	Int.	□	MAS0480MB	33.9	73.9	73	0.9	5
	6	Int.	★	MAS0480LB	48.9	88.9	88	0.9	5

⁎ : Standard hole size for rolled thread tap.

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON
4.9	3	Ext.	★	MAE0490MB	33.9	73.9	73	0.9	5
	3	Int.	□	MAS0490MB	33.9	73.9	73	0.9	5
	6	Int.	★	MAS0490LB	48.9	88.9	88	0.9	5
5.0	3	Ext.	★	MAE0500MB	33.9	73.9	73	0.9	5
	3	Int.	★	MAS0500MB	33.9	73.9	73	0.9	5
	6	Int.	★	MAS0500LB	48.9	88.9	88	0.9	5
5.1	3	Ext.	★	MAE0510MB	36.9	76.9	76	0.9	6
	3	Int.	□	MAS0510MB	36.9	76.9	76	0.9	6
	6	Int.	★	MAS0510LB	52.9	92.9	92	0.9	6
5.2	3	Ext.	★	MAE0520MB	36.9	76.9	76	0.9	6
	3	Int.	□	MAS0520MB	36.9	76.9	76	0.9	6
	6	Int.	★	MAS0520LB	52.9	92.9	92	0.9	6
5.3	3	Ext.	★	MAE0530MB	37.0	77.0	76	1.0	6
	3	Int.	□	MAS0530MB	37.0	77.0	76	1.0	6
	6	Int.	★	MAS0530LB	53.0	93.0	92	1.0	6
5.4	3	Ext.	★	MAE0540MB	37.0	77.0	76	1.0	6
	3	Int.	□	MAS0540MB	37.0	77.0	76	1.0	6
	6	Int.	★	MAS0540LB	53.0	93.0	92	1.0	6
5.5	3	Ext.	★	⁎ MAE0550MB	37.0	77.0	76	1.0	6
	3	Int.	★	⁎ MAS0550MB	37.0	77.0	76	1.0	6
	6	Int.	★	⁎ MAS0550LB	53.0	93.0	92	1.0	6
5.6	3	Ext.	★	MAE0560MB	40.0	80.0	79	1.0	6
	3	Int.	□	MAS0560MB	40.0	80.0	79	1.0	6
	6	Int.	★	MAS0560LB	58.0	98.0	97	1.0	6
5.7	3	Ext.	★	MAE0570MB	40.0	80.0	79	1.0	6
	3	Int.	□	MAS0570MB	40.0	80.0	79	1.0	6
	6	Int.	★	MAS0570LB	58.0	98.0	97	1.0	6
5.8	3	Ext.	★	MAE0580MB	40.1	80.1	79	1.1	6
	3	Int.	□	MAS0580MB	40.1	80.1	79	1.1	6
	6	Int.	★	MAS0580LB	58.1	98.1	97	1.1	6
5.9	3	Ext.	★	MAE0590MB	40.1	80.1	79	1.1	6
	3	Int.	□	MAS0590MB	40.1	80.1	79	1.1	6
	6	Int.	★	MAS0590LB	58.1	98.1	97	1.1	6
6.0	3	Ext.	★	MAE0600MB	40.1	80.1	79	1.1	6
	3	Int.	★	MAS0600MB	40.1	80.1	79	1.1	6
	6	Int.	★	MAS0600LB	58.1	98.1	97	1.1	6
6.1	3	Ext.	★	MAE0610MB	43.1	85.1	84	1.1	7
	3	Int.	□	MAS0610MB	43.1	85.1	84	1.1	7
	6	Int.	★	MAS0610LB	63.1	105.1	104	1.1	7
6.2	3	Ext.	★	MAE0620MB	43.1	85.1	84	1.1	7
	3	Int.	□	MAS0620MB	43.1	85.1	84	1.1	7
	6	Int.	★	MAS0620LB	63.1	105.1	104	1.1	7
6.3	3	Ext.	★	MAE0630MB	43.1	85.1	84	1.1	7
	3	Int.	□	MAS0630MB	43.1	85.1	84	1.1	7
	6	Int.	★	MAS0630LB	63.1	105.1	104	1.1	7
6.4	3	Ext.	★	MAE0640MB	43.2	85.2	84	1.2	7
	3	Int.	□	MAS0640MB	43.2	85.2	84	1.2	7
	6	Int.	★	MAS0640LB	63.2	105.2	104	1.2	7
6.5	3	Ext.	★	MAE0650MB	43.2	85.2	84	1.2	7
	3	Int.	★	MAS0650MB	43.2	85.2	84	1.2	7
	6	Int.	★	MAS0650LB	63.2	105.2	104	1.2	7
6.6	3	Ext.	★	MAE0660MB	43.2	85.2	84	1.2	7
	3	Int.	□	MAS0660MB	43.2	85.2	84	1.2	7
	6	Int.	★	MAS0660LB	66.2	108.2	107	1.2	7
6.7	3	Ext.	★	MAE0670MB	43.2	85.2	84	1.2	7
	3	Int.	□	MAS0670MB	43.2	85.2	84	1.2	7
	6	Int.	★	MAS0670LB	66.2	108.2	107	1.2	7
6.8	3	Ext.	★	MAE0680MB	43.2	85.2	84	1.2	7
	3	Int.	★	MAS0680MB	43.2	85.2	84	1.2	7
	6	Int.	★	MAS0680LB	66.2	108.2	107	1.2	7
6.9	3	Ext.	★	MAE0690MB	43.3	85.3	84	1.3	7
	3	Int.	□	MAS0690MB	43.3	85.3	84	1.3	7
	6	Int.	★	MAS0690LB	66.3	108.3	107	1.3	7
7.0	3	Ext.	★	MAE0700MB	43.3	85.3	84	1.3	7
	3	Int.	★	MAS0700MB	43.3	85.3	84	1.3	7
	6	Int.	★	MAS0700LB	66.3	108.3	107	1.3	7
7.1	3	Ext.	★	MAE0710MB	49.3	91.3	90	1.3	8
	3	Int.	□	MAS0710MB	49.3	91.3	90	1.3	8
	6	Int.	★	MAS0710LB	69.3	111.3	110	1.3	8
7.2	3	Ext.	★	MAE0720MB	49.3	91.3	90	1.3	8
	3	Int.	□	MAS0720MB	49.3	91.3	90	1.3	8
	6	Int.	★	MAS0720LB	69.3	111.3	110	1.3	8
7.3	3	Ext.	★	MAE0730MB	49.3	91.3	90	1.3	8
	3	Int.	□	MAS0730MB	49.3	91.3	90	1.3	8
	6	Int.	★	MAS0730LB	69.3	111.3	110	1.3	8
7.35	3	Ext.	★	⁎ MAE0735MB	49.3	91.3	90	1.3	8
	3	Int.	★	⁎ MAS0735MB	49.3	91.3	90	1.3	8
	6	Int.	★	⁎ MAS0735LB	69.3	111.3	110	1.3	8
7.4	3	Ext.	★	MAE0740MB	49.3	91.3	90	1.3	8
	3	Int.	□	MAS0740MB	49.3	91.3	90	1.3	8
	6	Int.	★	MAS0740LB	69.3	111.3	110	1.3	8
7.5	3	Ext.	★	MAE0750MB	49.4	91.4	90	1.4	8
	3	Int.	□	MAS0750MB	49.4	91.4	90	1.4	8
	6	Int.	★	MAS0750LB	69.4	111.4	110	1.4	8
7.6	3	Ext.	★	MAE0760MB	49.4	91.4	90	1.4	8
	3	Int.	□	MAS0760MB	49.4	91.4	90	1.4	8
	6	Int.	★	MAS0760LB	73.4	115.4	114	1.4	8
7.7	3	Ext.	★	MAE0770MB	49.4	91.4	90	1.4	8
	3	Int.	□	MAS0770MB	49.4	91.4	90	1.4	8
	6	Int.	★	MAS0770LB	73.4	115.4	114	1.4	8

CUTTING CONDITIONS ➤ L147
TECHNICAL DATA ➤ N001

MAE/MAS

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON
7.8	3	Ext.	★	MAE0780MB	49.4	91.4	90	1.4	8
	3	Int.	□	MAS0780MB	49.4	91.4	90	1.4	8
	6	Int.	★	MAS0780LB	73.4	115.4	114	1.4	8
7.9	3	Ext.	★	MAE0790MB	49.4	91.4	90	1.4	8
	3	Int.	□	MAS0790MB	49.4	91.4	90	1.4	8
	6	Int.	★	MAS0790LB	73.4	115.4	114	1.4	8
8.0	3	Ext.	★	MAE0800MB	49.5	91.5	90	1.5	8
	3	Int.	★	MAS0800MB	49.5	91.5	90	1.5	8
	6	Int.	★	MAS0800LB	73.5	115.5	114	1.5	8
8.1	3	Ext.	★	MAE0810MB	51.5	95.5	94	1.5	9
	3	Int.	□	MAS0810MB	51.5	95.5	94	1.5	9
	6	Int.	★	MAS0810LB	76.5	120.5	119	1.5	9
8.2	3	Ext.	★	MAE0820MB	51.5	95.5	94	1.5	9
	3	Int.	□	MAS0820MB	51.5	95.5	94	1.5	9
	6	Int.	★	MAS0820LB	76.5	120.5	119	1.5	9
8.3	3	Ext.	★	MAE0830MB	51.5	95.5	94	1.5	9
	3	Int.	□	MAS0830MB	51.5	95.5	94	1.5	9
	6	Int.	★	MAS0830LB	76.5	120.5	119	1.5	9
8.4	3	Ext.	★	MAE0840MB	51.5	95.5	94	1.5	9
	3	Int.	□	MAS0840MB	51.5	95.5	94	1.5	9
	6	Int.	★	MAS0840LB	76.5	120.5	119	1.5	9
8.5	3	Ext.	★	MAE0850MB	51.5	95.5	94	1.5	9
	3	Int.	★	MAS0850MB	51.5	95.5	94	1.5	9
	6	Int.	★	MAS0850LB	76.5	120.5	119	1.5	9
8.6	3	Ext.	★	MAE0860MB	51.6	95.6	94	1.6	9
	3	Int.	□	MAS0860MB	51.6	95.6	94	1.6	9
	6	Int.	★	MAS0860LB	78.6	122.6	121	1.6	9
8.7	3	Ext.	★	MAE0870MB	51.6	95.6	94	1.6	9
	3	Int.	□	MAS0870MB	51.6	95.6	94	1.6	9
	6	Int.	★	MAS0870LB	78.6	122.6	121	1.6	9
8.8	3	Ext.	★	MAE0880MB	51.6	95.6	94	1.6	9
	3	Int.	□	MAS0880MB	51.6	95.6	94	1.6	9
	6	Int.	★	MAS0880LB	78.6	122.6	121	1.6	9
8.9	3	Ext.	★	MAE0890MB	51.6	95.6	94	1.6	9
	3	Int.	□	MAS0890MB	51.6	95.6	94	1.6	9
	6	Int.	★	MAS0890LB	78.6	122.6	121	1.6	9
9.0	3	Ext.	★	MAE0900MB	51.6	95.6	94	1.6	9
	3	Int.	★	MAS0900MB	51.6	95.6	94	1.6	9
	6	Int.	★	MAS0900LB	78.6	122.6	121	1.6	9
9.1	3	Ext.	★	MAE0910MB	54.7	98.7	97	1.7	10
	3	Int.	□	MAS0910MB	54.7	98.7	97	1.7	10
	6	Int.	★	MAS0910LB	82.7	126.7	125	1.7	10
9.2	3	Ext.	★	MAE0920MB	54.7	98.7	97	1.7	10
	3	Int.	□	MAS0920MB	54.7	98.7	97	1.7	10
	6	Int.	★	MAS0920LB	82.7	126.7	125	1.7	10
9.21	3	Ext.	★	⁎ MAE0921MB	54.7	98.7	97	1.7	10
	3	Int.	★	⁎ MAS0921MB	54.7	98.7	97	1.7	10
	6	Int.	★	⁎ MAS0921LB	82.7	126.7	125	1.7	10
9.3	3	Ext.	★	MAE0930MB	54.7	98.7	97	1.7	10
	3	Int.	□	MAS0930MB	54.7	98.7	97	1.7	10
	6	Int.	★	MAS0930LB	82.7	126.7	125	1.7	10
9.4	3	Ext.	★	MAE0940MB	54.7	98.7	97	1.7	10
	3	Int.	□	MAS0940MB	54.7	98.7	97	1.7	10
	6	Int.	★	MAS0940LB	82.7	126.7	125	1.7	10
9.5	3	Ext.	★	MAE0950MB	54.7	98.7	97	1.7	10
	3	Int.	★	MAS0950MB	54.7	98.7	97	1.7	10
	6	Int.	★	MAS0950LB	82.7	126.7	125	1.7	10
9.6	3	Ext.	★	MAE0960MB	54.7	98.7	97	1.7	10
	3	Int.	□	MAS0960MB	54.7	98.7	97	1.7	10
	6	Int.	★	MAS0960LB	82.7	126.7	125	1.7	10
9.7	3	Ext.	★	MAE0970MB	54.8	98.8	97	1.8	10
	3	Int.	□	MAS0970MB	54.8	98.8	97	1.8	10
	6	Int.	★	MAS0970LB	82.8	126.8	125	1.8	10
9.8	3	Ext.	★	MAE0980MB	54.8	98.8	97	1.8	10
	3	Int.	□	MAS0980MB	54.8	98.8	97	1.8	10
	6	Int.	★	MAS0980LB	82.8	126.8	125	1.8	10
9.9	3	Ext.	★	MAE0990MB	54.8	98.8	97	1.8	10
	3	Int.	□	MAS0990MB	54.8	98.8	97	1.8	10
	6	Int.	★	MAS0990LB	82.8	126.8	125	1.8	10
10.0	3	Ext.	★	MAE1000MB	54.8	98.8	97	1.8	10
	3	Int.	★	MAS1000MB	54.8	98.8	97	1.8	10
	6	Int.	★	MAS1000LB	82.8	126.8	125	1.8	10
10.1	3	Ext.	□	MAE1010MB	56.8	102.8	101	1.8	11
	3	Int.	□	MAS1010MB	56.8	102.8	101	1.8	11
	6	Int.	□	MAS1010LB	90.8	136.8	135	1.8	11
10.2	3	Ext.	□	MAE1020MB	56.9	102.9	101	1.9	11
	3	Int.	□	MAS1020MB	56.9	102.9	101	1.9	11
	6	Int.	□	MAS1020LB	90.9	136.9	135	1.9	11
10.3	3	Ext.	★	MAE1030MB	56.9	102.9	101	1.9	11
	3	Int.	★	MAS1030MB	56.9	102.9	101	1.9	11
	6	Int.	★	MAS1030LB	90.9	136.9	135	1.9	11
10.4	3	Ext.	□	MAE1040MB	56.9	102.9	101	1.9	11
	3	Int.	□	MAS1040MB	56.9	102.9	101	1.9	11
	6	Int.	□	MAS1040LB	90.9	136.9	135	1.9	11
10.5	3	Ext.	★	MAE1050MB	56.9	102.9	101	1.9	11
	3	Int.	★	MAS1050MB	56.9	102.9	101	1.9	11
	6	Int.	★	MAS1050LB	90.9	136.9	135	1.9	11
10.6	3	Ext.	□	MAE1060MB	56.9	102.9	101	1.9	11
	3	Int.	□	MAS1060MB	56.9	102.9	101	1.9	11
	6	Int.	□	MAS1060LB	90.9	136.9	135	1.9	11

⁎ : Standard hole size for rolled thread tap.

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON
	3	Ext.	□	**MAE1070MB**	56.9	102.9	101	1.9	11
10.7	3	Int.	□	**MAS1070MB**	56.9	102.9	101	1.9	11
	6	Int.	□	**MAS1070LB**	90.9	136.9	135	1.9	11
	3	Ext.	□	**MAE1080MB**	57.0	103.0	101	2.0	11
10.8	3	Int.	□	**MAS1080MB**	57.0	103.0	101	2.0	11
	6	Int.	□	**MAS1080LB**	91.0	137.0	135	2.0	11
	3	Ext.	□	**MAE1090MB**	57.0	103.0	101	2.0	11
10.9	3	Int.	□	**MAS1090MB**	57.0	103.0	101	2.0	11
	6	Int.	□	**MAS1090LB**	91.0	137.0	135	2.0	11
	3	Ext.	★	**MAE1100MB**	57.0	103.0	101	2.0	11
11.0	3	Int.	★	**MAS1100MB**	57.0	103.0	101	2.0	11
	6	Int.	★	**MAS1100LB**	91.0	137.0	135	2.0	11
	3	Ext.	★	⁎ **MAE1108MB**	62.0	108.0	106	2.0	12
11.08	3	Int.	★	⁎ **MAS1108MB**	62.0	108.0	106	2.0	12
	6	Int.	★	⁎ **MAS1108LB**	96.0	142.0	140	2.0	12
	3	Ext.	□	**MAE1110MB**	62.0	108.0	106	2.0	12
11.1	3	Int.	□	**MAS1110MB**	62.0	108.0	106	2.0	12
	6	Int.	□	**MAS1110LB**	96.0	142.0	140	2.0	12
	3	Ext.	□	**MAE1120MB**	62.0	108.0	106	2.0	12
11.2	3	Int.	□	**MAS1120MB**	62.0	108.0	106	2.0	12
	6	Int.	□	**MAS1120LB**	96.0	142.0	140	2.0	12
	3	Ext.	□	**MAE1130MB**	62.1	108.1	106	2.1	12
11.3	3	Int.	□	**MAS1130MB**	62.1	108.1	106	2.1	12
	6	Int.	□	**MAS1130LB**	96.1	142.1	140	2.1	12
	3	Ext.	□	**MAE1140MB**	62.1	108.1	106	2.1	12
11.4	3	Int.	□	**MAS1140MB**	62.1	108.1	106	2.1	12
	6	Int.	□	**MAS1140LB**	96.1	142.1	140	2.1	12
	3	Ext.	□	**MAE1150MB**	62.1	108.1	106	2.1	12
11.5	3	Int.	□	**MAS1150MB**	62.1	108.1	106	2.1	12
	6	Int.	□	**MAS1150LB**	96.1	142.1	140	2.1	12
	3	Ext.	□	**MAE1160MB**	62.1	108.1	106	2.1	12
11.6	3	Int.	□	**MAS1160MB**	62.1	108.1	106	2.1	12
	6	Int.	□	**MAS1160LB**	96.1	142.1	140	2.1	12
	3	Ext.	□	**MAE1170MB**	62.1	108.1	106	2.1	12
11.7	3	Int.	□	**MAS1170MB**	62.1	108.1	106	2.1	12
	6	Int.	□	**MAS1170LB**	96.1	142.1	140	2.1	12
	3	Ext.	□	**MAE1180MB**	62.1	108.1	106	2.1	12
11.8	3	Int.	□	**MAS1180MB**	62.1	108.1	106	2.1	12
	6	Int.	□	**MAS1180LB**	96.1	142.1	140	2.1	12
	3	Ext.	□	**MAE1190MB**	62.2	108.2	106	2.2	12
11.9	3	Int.	□	**MAS1190MB**	62.2	108.2	106	2.2	12
	6	Int.	□	**MAS1190LB**	96.2	142.2	140	2.2	12
	3	Ext.	★	**MAE1200MB**	62.2	108.2	106	2.2	12
12.0	3	Int.	★	**MAS1200MB**	62.2	108.2	106	2.2	12
	6	Int.	★	**MAS1200LB**	96.2	142.2	140	2.2	12

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON
	3	Ext.	□	**MAE1210MB**	67.2	117.2	115	2.2	13
12.1	3	Int.	□	**MAS1210MB**	67.2	117.2	115	2.2	13
	6	Int.	□	**MAS1210LB**	102.2	152.2	150	2.2	13
	3	Ext.	□	**MAE1220MB**	67.2	117.2	115	2.2	13
12.2	3	Int.	□	**MAS1220MB**	67.2	117.2	115	2.2	13
	6	Int.	□	**MAS1220LB**	102.2	152.2	150	2.2	13
	3	Ext.	□	**MAE1230MB**	67.2	117.2	115	2.2	13
12.3	3	Int.	□	**MAS1230MB**	67.2	117.2	115	2.2	13
	6	Int.	□	**MAS1230LB**	102.2	152.2	150	2.2	13
	3	Ext.	□	**MAE1240MB**	67.3	117.3	115	2.3	13
12.4	3	Int.	□	**MAS1240MB**	67.3	117.3	115	2.3	13
	6	Int.	□	**MAS1240LB**	102.3	152.3	150	2.3	13
	3	Ext.	★	**MAE1250MB**	67.3	117.3	115	2.3	13
12.5	3	Int.	★	**MAS1250MB**	67.3	117.3	115	2.3	13
	6	Int.	★	**MAS1250LB**	102.3	152.3	150	2.3	13
	3	Ext.	□	**MAE1260MB**	67.3	117.3	115	2.3	13
12.6	3	Int.	□	**MAS1260MB**	67.3	117.3	115	2.3	13
	6	Int.	□	**MAS1260LB**	102.3	152.3	150	2.3	13
	3	Ext.	□	**MAE1270MB**	67.3	117.3	115	2.3	13
12.7	3	Int.	□	**MAS1270MB**	67.3	117.3	115	2.3	13
	6	Int.	□	**MAS1270LB**	102.3	152.3	150	2.3	13
	3	Ext.	□	**MAE1280MB**	67.3	117.3	115	2.3	13
12.8	3	Int.	□	**MAS1280MB**	67.3	117.3	115	2.3	13
	6	Int.	□	**MAS1280LB**	102.3	152.3	150	2.3	13
	3	Ext.	□	**MAE1290MB**	67.3	117.3	115	2.3	13
12.9	3	Int.	□	**MAS1290MB**	67.3	117.3	115	2.3	13
	6	Int.	□	**MAS1290LB**	102.3	152.3	150	2.3	13
	3	Ext.	★	⁎ **MAE1296MB**	67.4	117.4	115	2.4	13
12.96	3	Int.	★	⁎ **MAS1296MB**	67.4	117.4	115	2.4	13
	6	Int.	★	⁎ **MAS1296LB**	102.4	152.4	150	2.4	13
	3	Ext.	★	**MAE1300MB**	67.4	117.4	115	2.4	13
13.0	3	Int.	★	**MAS1300MB**	67.4	117.4	115	2.4	13
	6	Int.	★	**MAS1300LB**	102.4	152.4	150	2.4	13
	3	Ext.	□	**MAE1310MB**	72.4	122.4	120	2.4	14
13.1	3	Int.	□	**MAS1310MB**	72.4	122.4	120	2.4	14
	6	Int.	□	**MAS1310LB**	112.4	162.4	160	2.4	14
	3	Ext.	□	**MAE1320MB**	72.4	122.4	120	2.4	14
13.2	3	Int.	□	**MAS1320MB**	72.4	122.4	120	2.4	14
	6	Int.	□	**MAS1320LB**	112.4	162.4	160	2.4	14
	3	Ext.	□	**MAE1330MB**	72.4	122.4	120	2.4	14
13.3	3	Int.	□	**MAS1330MB**	72.4	122.4	120	2.4	14
	6	Int.	□	**MAS1330LB**	112.4	162.4	160	2.4	14
	3	Ext.	□	**MAE1340MB**	72.4	122.4	120	2.4	14
13.4	3	Int.	□	**MAS1340MB**	72.4	122.4	120	2.4	14
	6	Int.	□	**MAS1340LB**	112.4	162.4	160	2.4	14

CUTTING CONDITIONS ➤ L147
TECHNICAL DATA ➤ N001

MAE/MAS

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON
13.5	3	Ext.	★	MAE1350MB	72.5	122.5	120	2.5	14
	3	Int.	★	MAS1350MB	72.5	122.5	120	2.5	14
	6	Int.	★	MAS1350LB	112.5	162.5	160	2.5	14
13.6	3	Ext.	□	MAE1360MB	72.5	122.5	120	2.5	14
	3	Int.	□	MAS1360MB	72.5	122.5	120	2.5	14
	6	Int.	□	MAS1360LB	112.5	162.5	160	2.5	14
13.7	3	Ext.	□	MAE1370MB	72.5	122.5	120	2.5	14
	3	Int.	□	MAS1370MB	72.5	122.5	120	2.5	14
	6	Int.	□	MAS1370LB	112.5	162.5	160	2.5	14
13.8	3	Ext.	□	MAE1380MB	72.5	122.5	120	2.5	14
	3	Int.	□	MAS1380MB	72.5	122.5	120	2.5	14
	6	Int.	□	MAS1380LB	112.5	162.5	160	2.5	14
13.9	3	Ext.	□	MAE1390MB	72.5	122.5	120	2.5	14
	3	Int.	□	MAS1390MB	72.5	122.5	120	2.5	14
	6	Int.	□	MAS1390LB	112.5	162.5	160	2.5	14
14.0	3	Ext.	★	⁎ MAE1400MB	72.5	122.5	120	2.5	14
	3	Int.	★	⁎ MAS1400MB	72.5	122.5	120	2.5	14
	6	Int.	★	⁎ MAS1400LB	112.5	162.5	160	2.5	14
14.1	3	Ext.	□	MAE1410MB	74.6	132.6	130	2.6	15
	3	Int.	□	MAS1410MB	74.6	132.6	130	2.6	15
	6	Int.	□	MAS1410LB	117.6	175.6	173	2.6	15
14.2	3	Ext.	□	MAE1420MB	74.6	132.6	130	2.6	15
	3	Int.	□	MAS1420MB	74.6	132.6	130	2.6	15
	6	Int.	□	MAS1420LB	117.6	175.6	173	2.6	15
14.3	3	Ext.	□	MAE1430MB	74.6	132.6	130	2.6	15
	3	Int.	□	MAS1430MB	74.6	132.6	130	2.6	15
	6	Int.	□	MAS1430LB	117.6	175.6	173	2.6	15
14.4	3	Ext.	□	MAE1440MB	74.6	132.6	130	2.6	15
	3	Int.	□	MAS1440MB	74.6	132.6	130	2.6	15
	6	Int.	□	MAS1440LB	117.6	175.6	173	2.6	15
14.5	3	Ext.	□	MAE1450MB	74.6	132.6	130	2.6	15
	3	Int.	□	MAS1450MB	74.6	132.6	130	2.6	15
	6	Int.	□	MAS1450LB	117.6	175.6	173	2.6	15
14.6	3	Ext.	□	MAE1460MB	74.7	132.7	130	2.7	15
	3	Int.	□	MAS1460MB	74.7	132.7	130	2.7	15
	6	Int.	□	MAS1460LB	117.7	175.7	173	2.7	15
14.7	3	Ext.	□	MAE1470MB	74.7	132.7	130	2.7	15
	3	Int.	□	MAS1470MB	74.7	132.7	130	2.7	15
	6	Int.	□	MAS1470LB	117.7	175.7	173	2.7	15
14.8	3	Ext.	□	MAE1480MB	74.7	132.7	130	2.7	15
	3	Int.	□	MAS1480MB	74.7	132.7	130	2.7	15
	6	Int.	□	MAS1480LB	117.7	175.7	173	2.7	15
14.9	3	Ext.	□	MAE1490MB	74.7	132.7	130	2.7	15
	3	Int.	□	MAS1490MB	74.7	132.7	130	2.7	15
	6	Int.	□	MAS1490LB	117.7	175.7	173	2.7	15
14.96	3	Ext.	★	⁎ MAE1496MB	74.7	132.7	130	2.7	15
	3	Int.	★	⁎ MAS1496MB	74.7	132.7	130	2.7	15
	6	Int.	★	⁎ MAS1496LB	117.7	175.7	173	2.7	15
15.0	3	Ext.	★	MAE1500MB	74.7	132.7	130	2.7	15
	3	Int.	★	MAS1500MB	74.7	132.7	130	2.7	15
	6	Int.	★	MAS1500LB	117.7	175.7	173	2.7	15
15.1	3	Ext.	□	MAE1510MB	78.7	136.7	134	2.7	16
	3	Int.	□	MAS1510MB	78.7	136.7	134	2.7	16
	6	Int.	□	MAS1510LB	122.7	180.7	178	2.7	16
15.2	3	Ext.	□	MAE1520MB	78.8	136.8	134	2.8	16
	3	Int.	□	MAS1520MB	78.8	136.8	134	2.8	16
	6	Int.	□	MAS1520LB	122.8	180.8	178	2.8	16
15.3	3	Ext.	□	MAE1530MB	78.8	136.8	134	2.8	16
	3	Int.	□	MAS1530MB	78.8	136.8	134	2.8	16
	6	Int.	□	MAS1530LB	122.8	180.8	178	2.8	16
15.4	3	Ext.	□	MAE1540MB	78.8	136.8	134	2.8	16
	3	Int.	□	MAS1540MB	78.8	136.8	134	2.8	16
	6	Int.	□	MAS1540LB	122.8	180.8	178	2.8	16
15.5	3	Ext.	□	MAE1550MB	78.8	136.8	134	2.8	16
	3	Int.	□	MAS1550MB	78.8	136.8	134	2.8	16
	6	Int.	□	MAS1550LB	122.8	180.8	178	2.8	16
15.6	3	Ext.	□	MAE1560MB	78.8	136.8	134	2.8	16
	3	Int.	□	MAS1560MB	78.8	136.8	134	2.8	16
	6	Int.	□	MAS1560LB	122.8	180.8	178	2.8	16
15.7	3	Ext.	□	MAE1570MB	78.9	136.9	134	2.9	16
	3	Int.	□	MAS1570MB	78.9	136.9	134	2.9	16
	6	Int.	□	MAS1570LB	122.9	180.9	178	2.9	16
15.8	3	Ext.	□	⁎ MAE1580MB	78.9	136.9	134	2.9	16
	3	Int.	□	⁎ MAS1580MB	78.9	136.9	134	2.9	16
	6	Int.	□	⁎ MAS1580LB	122.9	180.9	178	2.9	16
15.9	3	Ext.	□	MAE1590MB	78.9	136.9	134	2.9	16
	3	Int.	□	MAS1590MB	78.9	136.9	134	2.9	16
	6	Int.	□	MAS1590LB	122.9	180.9	178	2.9	16
16.0	3	Ext.	★	MAE1600MB	78.9	136.9	134	2.9	16
	3	Int.	★	MAS1600MB	78.9	136.9	134	2.9	16
	6	Int.	★	MAS1600LB	122.9	180.9	178	2.9	16

⁎ : Standard hole size for rolled thread tap.

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

RECOMMENDED CUTTING CONDITIONS

Tool		Work Material	Drill Diameter ø3.0—ø6.0 mm ø.118"—ø.236"		Drill Diameter ø6.0—ø10.0 mm ø.240"—ø.394"		Drill Diameter ø10.0—ø16.0 mm ø.398"—ø.630"	
			Cutting Speed (SFM)	Feed (IPR)	Cutting Speed (SFM)	Feed (IPR)	Cutting Speed (SFM)	Feed (IPR)
MAE	N	Cast Aluminum Alloy	295 (130—460)	.006 (.002—.012)	330 (165—490)	.008 (.002—.012)	395 (195—560)	.010 (.004—.016)
		Die Cast Aluminum Alloy	330 (195—490)	.005 (.002—.010)	360 (230—525)	.006 (.002—.010)	425 (260—590)	.008 (.004—.012)
	K	Gray Cast Iron	130 (65—195)	.006 (.004—.008)	195 (130—260)	.008 (.004—.012)	260 (195—330)	.012 (.008—.016)
		Ductile Cast Iron	100 (65—130)	.004 (.002—.006)	130 (65—195)	.005 (.002—.008)	195 (130—260)	.008 (.004—.012)
MAS	N	Cast Aluminum Alloy	300 (195—490)	.006 (.002—.012)	390 (260—555)	.008 (.004—.012)	490 (330—655)	.010 (.004—.016)
		Die Cast Aluminum Alloy	390 (260—555)	.005 (.002—.010)	490 (330—590)	.006 (.002—.010)	525 (390—655)	.008 (.004—.012)
	K	Gray Cast Iron	195 (130—260)	.006 (.004—.008)	260 (195—360)	.008 (.004—.012)	330 (230—425)	.012 (.008—.016)
		Ductile Cast Iron	145 (100—195)	.004 (.002—.006)	195 (130—260)	.005 (.002—.008)	260 (195—330)	.008 (.004—.012)

HOLE AND DRILL DIAMETERS FOR THREAD

Thread Size	Thread Tapping			Roll Thread Tapping		
	Super Burnish Drill Diameter (**DC**mm)	Hole Diameter Tolerance (ømm)		Super Burnish Drill Diameter (**DC**mm)	Hole Diameter Tolerance (ømm)	
		Max.	Min.		Max.	Min.
M4x0.7	**3.3**	3.242	3.422	**3.65**	3.65	3.70
M5x0.8	**4.2**	4.134	4.334	**4.60**	4.59	4.66
M6x1.0	**5.0**	4.917	5.153	**5.50**	5.48	5.57
M8x1.25	**6.8**	6.647	6.912	**7.35**	7.34	7.41
M10x1.5	**8.5**	8.376	8.676	**9.21**	9.18	9.28
M12x1.75	**10.3**	10.106	10.441	**11.08**	11.05	11.15
M14x2	**12.0**	11.835	12.210	**12.96**	12.92	13.04
M16x2	**14.0**	13.835	14.210	**14.96**	14.92	15.04

MSE

- Wide flute for preventing chip jamming.
- Stable, small diameter machining.

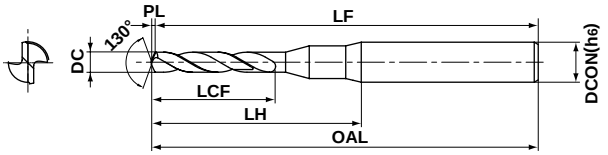
P | M | K | N | S | H

Tolerance	0.10≤DC≤0.99
DC (mm)	$^{0}_{-0.009}$
DCON (mm)	$^{0}_{-0.006}$

METRIC STANDARD

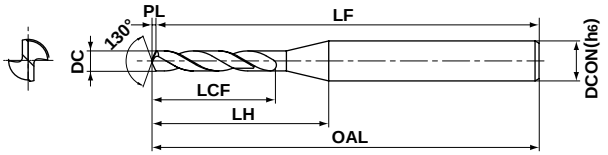


Type A





Type B



(Note) MSE type can be used for shrink fit holders.

External Coolant

DC (mm)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.10	★		MSE0010SB	1.22	9.72	38.02	38	0.02	3	A
0.11	★		MSE0011SB	1.23	9.73	38.03	38	0.03	3	A
0.12	★		MSE0012SB	1.43	9.73	38.03	38	0.03	3	A
0.13	★		MSE0013SB	1.43	9.73	38.03	38	0.03	3	A
0.14	★		MSE0014SB	2.03	9.73	38.03	38	0.03	3	A
0.15	★		MSE0015SB	2.03	9.73	38.03	38	0.03	3	A
0.16	★		MSE0016SB	2.04	9.74	38.04	38	0.04	3	A
0.17	★		MSE0017SB	2.04	9.74	38.04	38	0.04	3	A
0.18	★		MSE0018SB	2.04	9.74	38.04	38	0.04	3	A
0.19	★		MSE0019SB	2.04	9.74	38.04	38	0.04	3	A
0.20	★		MSE0020SB	2.55	9.75	38.05	38	0.05	3	A
0.21	★		MSE0021SB	2.55	9.75	38.05	38	0.05	3	A
0.22	★		MSE0022SB	2.55	9.75	38.05	38	0.05	3	A
0.23	★		MSE0023SB	2.55	9.75	38.05	38	0.05	3	A
0.24	★		MSE0024SB	3.06	9.76	38.06	38	0.06	3	A
0.25	★		MSE0025SB	3.06	9.76	38.06	38	0.06	3	A
0.26	★		MSE0026SB	3.06	9.76	38.06	38	0.06	3	A
0.27	★		MSE0027SB	3.06	9.76	38.06	38	0.06	3	A
0.28	★		MSE0028SB	3.07	9.77	38.07	38	0.07	3	A
0.29	★		MSE0029SB	3.07	9.77	38.07	38	0.07	3	A
0.30		★	MSE0030SB	5.07	10.27	38.07	38	0.07	3	B
0.31		★	MSE0031SB	5.07	10.27	38.07	38	0.07	3	B
0.32		★	MSE0032SB	5.07	10.27	38.07	38	0.07	3	B
0.33		★	MSE0033SB	5.08	10.28	38.08	38	0.08	3	B
0.34		★	MSE0034SB	6.08	11.28	38.08	38	0.08	3	B
0.35		★	MSE0035SB	6.08	11.18	38.08	38	0.08	3	B
0.36		★	MSE0036SB	6.08	11.18	38.08	38	0.08	3	B
0.37		★	MSE0037SB	6.09	11.19	38.09	38	0.09	3	B
0.38		★	MSE0038SB	6.09	11.19	38.09	38	0.09	3	B
0.39		★	MSE0039SB	6.09	11.19	38.09	38	0.09	3	B
0.40		★	MSE0040SB	7.09	12.19	38.09	38	0.09	3	B
0.41		★	MSE0041SB	7.10	12.10	38.10	38	0.10	3	B

External Coolant

DC (mm)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.42		★	MSE0042SB	7.10	12.10	38.10	38	0.10	3	B
0.43		★	MSE0043SB	7.10	12.10	38.10	38	0.10	3	B
0.44		★	MSE0044SB	7.10	12.10	38.10	38	0.10	3	B
0.45		★	MSE0045SB	7.10	12.10	38.10	38	0.10	3	B
0.46		★	MSE0046SB	7.11	12.01	38.11	38	0.11	3	B
0.47		★	MSE0047SB	7.11	12.01	38.11	38	0.11	3	B
0.48		★	MSE0048SB	7.11	12.01	38.11	38	0.11	3	B
0.49		★	MSE0049SB	7.11	12.01	38.11	38	0.11	3	B
0.50		★	MSE0050SB	7.12	12.02	38.12	38	0.12	3	B
0.51		★	MSE0051SB	7.12	11.92	38.12	38	0.12	3	B
0.52		★	MSE0052SB	7.12	11.92	38.12	38	0.12	3	B
0.53		★	MSE0053SB	7.12	11.92	38.12	38	0.12	3	B
0.54		★	MSE0054SB	7.13	11.93	38.13	38	0.13	3	B
0.55		★	MSE0055SB	7.13	11.93	38.13	38	0.13	3	B
0.56		★	MSE0056SB	7.13	11.93	38.13	38	0.13	3	B
0.57		★	MSE0057SB	7.13	11.83	38.13	38	0.13	3	B
0.58		★	MSE0058SB	7.14	11.84	38.14	38	0.14	3	B
0.59		★	MSE0059SB	7.14	11.84	38.14	38	0.14	3	B
0.60		★	MSE0060SB	7.14	11.84	38.14	38	0.14	3	B
0.61		★	MSE0061SB	7.14	11.84	38.14	38	0.14	3	B
0.62		★	MSE0062SB	7.14	11.74	38.14	38	0.14	3	B
0.63		★	MSE0063SB	7.15	11.75	38.15	38	0.15	3	B
0.64		★	MSE0064SB	7.15	11.75	38.15	38	0.15	3	B
0.65		★	MSE0065SB	7.15	11.75	38.15	38	0.15	3	B
0.66		★	MSE0066SB	7.15	11.75	38.15	38	0.15	3	B
0.67		★	MSE0067SB	7.16	11.66	38.16	38	0.16	3	B
0.68		★	MSE0068SB	7.16	11.66	38.16	38	0.16	3	B
0.69		★	MSE0069SB	7.16	11.66	38.16	38	0.16	3	B
0.70		★	MSE0070SB	8.16	12.66	38.16	38	0.16	3	B
0.71		★	MSE0071SB	8.17	12.67	38.17	38	0.17	3	B
0.72		★	MSE0072SB	8.17	12.67	38.17	38	0.17	3	B
0.73		★	MSE0073SB	8.17	12.57	38.17	38	0.17	3	B

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan.

External Coolant

DC (mm)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.74		★	**MSE0074SB**	8.17	12.57	38.17	38	0.17	3	B
0.75		★	MSE**0075SB**	8.17	12.57	38.17	38	0.17	3	B
0.76		★	MSE**0076SB**	8.18	12.58	38.18	38	0.18	3	B
0.77		★	MSE**0077SB**	8.18	12.58	38.18	38	0.18	3	B
0.78		★	MSE**0078SB**	8.18	12.48	38.18	38	0.18	3	B
0.79		★	MSE**0079SB**	8.18	12.48	38.18	38	0.18	3	B
0.80		★	MSE**0080SB**	10.19	14.49	38.19	38	0.19	3	B
0.81		★	MSE**0081SB**	10.19	14.49	38.19	38	0.19	3	B
0.82		★	MSE**0082SB**	10.19	14.49	38.19	38	0.19	3	B
0.83		★	MSE**0083SB**	10.19	14.49	38.19	38	0.19	3	B
0.84		★	MSE**0084SB**	10.20	14.40	38.20	38	0.20	3	B
0.85		★	MSE**0085SB**	10.20	14.40	38.20	38	0.20	3	B
0.86		★	MSE**0086SB**	10.20	14.40	38.20	38	0.20	3	B

External Coolant

DC (mm)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.87		★	**MSE0087SB**	10.20	14.40	38.20	38	0.20	3	B
0.88		★	MSE**0088SB**	10.21	14.41	38.21	38	0.21	3	B
0.89		★	MSE**0089SB**	10.21	14.31	38.21	38	0.21	3	B
0.90		★	MSE**0090SB**	10.21	14.31	38.21	38	0.21	3	B
0.91		★	MSE**0091SB**	10.21	14.31	38.21	38	0.21	3	B
0.92		★	MSE**0092SB**	10.21	14.31	38.21	38	0.21	3	B
0.93		★	MSE**0093SB**	10.22	14.32	38.22	38	0.22	3	B
0.94		★	MSE**0094SB**	10.22	14.22	38.22	38	0.22	3	B
0.95		★	MSE**0095SB**	10.22	14.22	38.22	38	0.22	3	B
0.96		★	MSE**0096SB**	10.22	14.22	38.22	38	0.22	3	B
0.97		★	MSE**0097SB**	10.23	14.23	38.23	38	0.23	3	B
0.98		★	MSE**0098SB**	10.23	14.23	38.23	38	0.23	3	B
0.99		★	MSE**0099SB**	10.23	14.23	38.23	38	0.23	3	B

RECOMMENDED CUTTING CONDITIONS

Work Material	Mild Steel (≤180HB) AISI 1010 etc.			Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.		
Drill Dia. **DC** inch	Drill Dia. **DC** mm	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Peck (inch)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Peck (inch)
.00394	0.10	20 (15—25)	.0001 (.00004—.0001)	.0008	20 (15—25)	.0001 (.00004—.0001)	.0008
.00472	0.12	25 (15—35)	.0001 (.00004—.0001)	.0008	25 (15—35)	.0001 (.00004—.0001)	.0008
.00630	0.16	35 (20—45)	.0001 (.00004—.0001)	.0008	35 (20—45)	.0001 (.00004—.0001)	.0008
.00787	0.20	40 (25—50)	.0001 (.0001—.0002)	.0016	40 (25—50)	.0001 (.0001—.0002)	.0016
.00984	0.25	50 (35—65)	.0001 (.0001—.0002)	.0016	50 (35—65)	.0001 (.0001—.0002)	.0016
.01260	0.32	65 (45—85)	.0002 (.0001—.0002)	.0020	65 (45—85)	.0002 (.0001—.0002)	.0020
.01575	0.40	80 (50—105)	.0002 (.0001—.0002)	.0020	80 (50—105)	.0002 (.0001—.0002)	.0020
.01969	0.50	105 (65—115)	.0002 (.0002—.0003)	.0039	105 (65—115)	.0002 (.0002—.0003)	.0039
.02480	0.63	130 (80—150)	.0003 (.0002—.0004)	.0039	130 (80—150)	.0003 (.0002—.0004)	.0039
.03150	0.80	165 (115—195)	.0008 (.0006—.0010)	.0118	165 (115—195)	.0006 (.0005—.0007)	.0118
.03937	0.99	205 (130—230)	.0016 (.0012—.0020)	.0118	205 (130—230)	.0008 (.0006—.0010)	.0118

(Note 1) When drilling holes up to ϕ0.3mm, the use of a spot drill is recommended. (Order number : MSP0300SB, Cutting conditions : See below.)
(Note 2) Change cutting conditions depending on your machine and workpiece rigidity.
(Note 3) When machining holes over 5DC, reduce the step stated above.
(Note 4) The use of water-soluble fluid (diluted by 20 times) is recommended for drilling under the cutting conditions above. Lower the revolutions if you use oil fluid or mist.
(Note 5) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MSE

Work Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.			Pre-hardened Steel AISI P21, P20 etc.		
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Peck (inch)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Peck (inch)
inch	mm						
.00394	0.10	20 (15—25)	.0001 (.00004—.0001)	.0008	20 (15—25)	.0001 (.00004—.0001)	.0008
.00472	0.12	25 (15—35)	.0001 (.00004—.0001)	.0008	25 (15—35)	.0001 (.00004—.0001)	.0008
.00630	0.16	35 (20—45)	.0001 (.00004—.0001)	.0008	35 (20—45)	.0001 (.00004—.0001)	.0008
.00787	0.20	40 (25—50)	.0001 (.00008—.0002)	.0016	40 (25—50)	.0001 (.00008—.0002)	.0016
.00984	0.25	50 (35—65)	.0001 (.00008—.0002)	.0016	50 (35—65)	.0001 (.00008—.0002)	.0016
.01260	0.32	65 (45—85)	.0002 (.00012—.0002)	.0020	65 (45—85)	.0002 (.00012—.0002)	.0020
.01575	0.40	80 (50—105)	.0002 (.00012—.0002)	.0020	80 (50—105)	.0002 (.00012—.0002)	.0020
.01969	0.50	105 (65—115)	.0002 (.00020—.0003)	.0039	105 (65—115)	.0002 (.00020—.0003)	.0039
.02480	0.63	130 (80—150)	.0003 (.00024—.0004)	.0039	130 (80—150)	.0003 (.00024—.0004)	.0039
.03150	0.80	165 (115—195)	.0006 (.00047—.0007)	.0118	165 (115—195)	.0006 (.00047—.0007)	.0118
.03937	0.99	205 (130—230)	.0008 (.00059—.0010)	.0118	205 (130—230)	.0008 (.00059—.0010)	.0118

Work Material		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.			Gray Cast Iron (≤350MPa) No45B etc.		
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Peck (inch)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Peck (inch)
inch	mm						
.00394	0.10	20 (15—25)	.0001 (.00004—.0001)	.0008	20 (15—25)	.0001 (.00004—.0001)	.0008
.00472	0.12	25 (15—35)	.0001 (.00004—.0001)	.0008	25 (15—35)	.0001 (.00004—.0001)	.0008
.00630	0.16	35 (20—45)	.0001 (.00004—.0001)	.0008	35 (20—45)	.0001 (.00004—.0001)	.0008
.00787	0.20	35 (20—45)	.0001 (.00008—.0002)	.0016	40 (25—50)	.0001 (.00008—.0002)	.0016
.00984	0.25	45 (25—60)	.0001 (.00008—.0002)	.0016	50 (35—65)	.0001 (.00008—.0002)	.0016
.01260	0.32	50 (35—65)	.0002 (.00012—.0002)	.0020	65 (45—85)	.0002 (.00012—.0002)	.0020
.01575	0.40	50 (35—60)	.0002 (.00012—.0002)	.0020	80 (50—105)	.0002 (.00012—.0002)	.0020
.01969	0.50	50 (35—65)	.0002 (.00020—.0003)	.0039	105 (65—115)	.0002 (.00020—.0003)	.0039
.02480	0.63	50 (35—65)	.0003 (.00024—.0004)	.0039	130 (80—150)	.0003 (.00024—.0004)	.0039
.03150	0.80	50 (35—65)	.0006 (.00047—.0007)	.0079	165 (115—195)	.0008 (.00059—.0010)	.0118
.03937	0.99	50 (35—65)	.0008 (.00059—.0010)	.0079	205 (130—230)	.0016 (.00118—.0020)	.0118

Work Material		Aluminium Alloy (Si<5%) ASTM A6061, A7075 etc.			Heat Resistant Alloy Inconel718 etc.		
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Peck (inch)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Peck (inch)
inch	mm						
.00394	0.10	20 (15—25)	.0001 (.00004—.0001)	.0020	5 (5—15)	.00004 (.00002—.00004)	.0008
.00472	0.12	25 (15—35)	.0001 (.00008—.0002)	.0020	10 (5—15)	.00004 (.00002—.00004)	.0008
.00630	0.16	35 (20—45)	.0002 (.00012—.0002)	.0020	15 (10—20)	.00004 (.00002—.00004)	.0008
.00787	0.20	40 (25—50)	.0002 (.00020—.0003)	.0039	15 (10—20)	.00008 (.00004—.00008)	.0016
.00984	0.25	50 (35—65)	.0003 (.00024—.0004)	.0039	15 (10—20)	.00008 (.00004—.00008)	.0016
.01260	0.32	65 (45—85)	.0004 (.00031—.0005)	.0118	15 (10—20)	.00008 (.00004—.00008)	.0020
.01575	0.40	80 (50—105)	.0008 (.00059—.0010)	.0118	15 (15—20)	.00008 (.00004—.00008)	.0020
.01969	0.50	105 (65—115)	.0012 (.00098—.0014)	.0197	15 (15—35)	.00012 (.00004—.00012)	.0039
.02480	0.63	130 (80—150)	.0016 (.00138—.0018)	.0197	20 (15—35)	.00016 (.00008—.00016)	.0039
.03150	0.80	165 (115—195)	.0020 (.00177—.0022)	.0315	20 (15—35)	.00024 (.00016—.00024)	.0079
.03937	0.99	205 (130—230)	.0024 (.00217—.0026)	.0315	20 (15—35)	.00039 (.00031—.00039)	.0079

(Note 1) When drilling holes up to ϕ0.3mm, the use of a spot drill is recommended. (Order number : MSP0300SB, Cutting conditions : See below.)
(Note 2) Change cutting conditions depending on your machine and workpiece rigidity.
(Note 3) When machining holes over 5DC, reduce the step stated above.
(Note 4) The use of water-soluble fluid (diluted by 20 times) is recommended for drilling under the cutting conditions above. Lower the revolutions if you use oil fluid or mist.
(Note 5) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

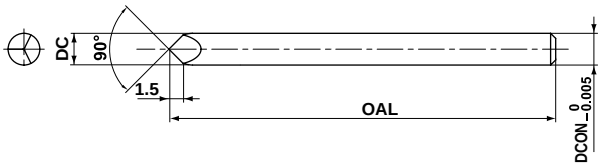
MSP STARTER Drill

●For use with MSE Type drill.

P M K N S H

METRIC STANDARD





(Note) MSP type can be used for shrink fit holders.

Order Number	Grade	Stock	Dimensions (mm)			Range of Diameter (mm)
			DC	DCON	OAL	
MSP0300SB	**VP15TF**	●	3.0	3.0	38	**0.1—3.0**

RECOMMENDED CUTTING CONDITIONS

DC (mm)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
0.1—3.0	10—310	10000	.00002 (.00001—.00004)

DRILLING

● : Inventory maintained.

REFERENCE TABLE OF PRE-HOLE DIMENSIONS

Unit : mm

Description	Cutting Dia.	Pre-hole Diameter	Pre-hole Depth
MSE0010SB	0.10	0.060—0.080	0.030—0.040
MSE0011SB	0.11	0.066—0.088	0.033—0.044
MSE0012SB	0.12	0.072—0.096	0.036—0.048
MSE0013SB	0.13	0.078—0.104	0.039—0.052
MSE0014SB	0.14	0.084—0.112	0.042—0.056
MSE0015SB	0.15	0.090—0.120	0.045—0.060
MSE0016SB	0.16	0.096—0.128	0.048—0.064
MSE0017SB	0.17	0.102—0.136	0.051—0.068
MSE0018SB	0.18	0.108—0.144	0.054—0.072
MSE0019SB	0.19	0.114—0.152	0.057—0.076
MSE0020SB	0.20	0.120—0.160	0.060—0.080
MSE0021SB	0.21	0.126—0.168	0.063—0.084
MSE0022SB	0.22	0.132—0.176	0.066—0.088
MSE0023SB	0.23	0.138—0.184	0.069—0.092
MSE0024SB	0.24	0.144—0.192	0.072—0.096
MSE0025SB	0.25	0.150—0.200	0.075—0.100
MSE0026SB	0.26	0.156—0.208	0.078—0.104
MSE0027SB	0.27	0.162—0.216	0.081—0.108
MSE0028SB	0.28	0.168—0.224	0.084—0.112
MSE0029SB	0.29	0.174—0.232	0.087—0.116
MSE0030SB	0.30	0.180—0.240	0.090—0.120
MSE0031SB	0.31	0.186—0.248	0.093—0.124
MSE0032SB	0.32	0.192—0.256	0.096—0.128
MSE0033SB	0.33	0.198—0.264	0.099—0.132
MSE0034SB	0.34	0.204—0.272	0.102—0.136
MSE0035SB	0.35	0.210—0.280	0.105—0.140
MSE0036SB	0.36	0.216—0.288	0.108—0.144
MSE0037SB	0.37	0.222—0.296	0.111—0.148
MSE0038SB	0.38	0.228—0.304	0.114—0.152
MSE0039SB	0.39	0.234—0.312	0.117—0.156
MSE0040SB	0.40	0.240—0.320	0.120—0.160
MSE0041SB	0.41	0.246—0.328	0.123—0.164
MSE0042SB	0.42	0.252—0.336	0.126—0.168
MSE0043SB	0.43	0.258—0.344	0.129—0.172
MSE0044SB	0.44	0.264—0.352	0.132—0.176
MSE0045SB	0.45	0.270—0.360	0.135—0.180
MSE0046SB	0.46	0.276—0.368	0.138—0.184
MSE0047SB	0.47	0.282—0.376	0.141—0.188
MSE0048SB	0.48	0.288—0.384	0.144—0.192
MSE0049SB	0.49	0.294—0.392	0.147—0.196
MSE0050SB	0.50	0.300—0.400	0.150—0.200
MSE0051SB	0.51	0.306—0.408	0.153—0.204
MSE0052SB	0.52	0.312—0.416	0.156—0.208
MSE0053SB	0.53	0.318—0.424	0.159—0.212
MSE0054SB	0.54	0.324—0.432	0.162—0.216

Description	Cutting Dia.	Pre-hole Diameter	Pre-hole Depth
MSE0055SB	0.55	0.330—0.440	0.165—0.220
MSE0056SB	0.56	0.336—0.448	0.168—0.224
MSE0057SB	0.57	0.342—0.456	0.171—0.228
MSE0058SB	0.58	0.348—0.464	0.174—0.232
MSE0059SB	0.59	0.354—0.472	0.177—0.236
MSE0060SB	0.60	0.360—0.480	0.180—0.240
MSE0061SB	0.61	0.366—0.488	0.183—0.244
MSE0062SB	0.62	0.372—0.496	0.186—0.248
MSE0063SB	0.63	0.378—0.504	0.189—0.252
MSE0064SB	0.64	0.384—0.512	0.192—0.256
MSE0065SB	0.65	0.390—0.520	0.195—0.260
MSE0066SB	0.66	0.396—0.528	0.198—0.264
MSE0067SB	0.67	0.402—0.536	0.201—0.268
MSE0068SB	0.68	0.408—0.544	0.204—0.272
MSE0069SB	0.69	0.414—0.552	0.207—0.276
MSE0070SB	0.70	0.420—0.560	0.210—0.280
MSE0071SB	0.71	0.426—0.568	0.213—0.284
MSE0072SB	0.72	0.432—0.576	0.216—0.288
MSE0073SB	0.73	0.438—0.584	0.219—0.292
MSE0074SB	0.74	0.444—0.592	0.222—0.296
MSE0075SB	0.75	0.450—0.600	0.225—0.300
MSE0076SB	0.76	0.456—0.608	0.228—0.304
MSE0077SB	0.77	0.462—0.616	0.231—0.308
MSE0078SB	0.78	0.468—0.624	0.234—0.312
MSE0079SB	0.79	0.474—0.632	0.237—0.316
MSE0080SB	0.80	0.480—0.640	0.240—0.320
MSE0081SB	0.81	0.486—0.648	0.243—0.324
MSE0082SB	0.82	0.492—0.656	0.246—0.328
MSE0083SB	0.83	0.498—0.664	0.249—0.332
MSE0084SB	0.84	0.504—0.672	0.252—0.336
MSE0085SB	0.85	0.510—0.680	0.255—0.340
MSE0086SB	0.86	0.516—0.688	0.258—0.344
MSE0087SB	0.87	0.522—0.696	0.261—0.348
MSE0088SB	0.88	0.528—0.704	0.264—0.352
MSE0089SB	0.89	0.534—0.712	0.267—0.356
MSE0090SB	0.90	0.540—0.720	0.270—0.360
MSE0091SB	0.91	0.546—0.728	0.273—0.364
MSE0092SB	0.92	0.552—0.736	0.276—0.368
MSE0093SB	0.93	0.558—0.744	0.279—0.372
MSE0094SB	0.94	0.564—0.752	0.282—0.376
MSE0095SB	0.95	0.570—0.760	0.285—0.380
MSE0096SB	0.96	0.576—0.768	0.288—0.384
MSE0097SB	0.97	0.582—0.776	0.291—0.388
MSE0098SB	0.98	0.588—0.784	0.294—0.392
MSE0099SB	0.99	0.594—0.792	0.297—0.396

Memo

MICRO-MZE/MZS

- Excellent chip disposal.
- Helical through coolant hole enables high speed machining (MZS type).

P M K N S H

only MZE

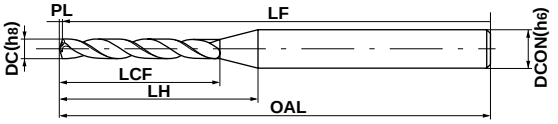
Tolerance	.0394≤DC≤.1094	DC=.1200
DC (inch)	0 −0.00055	0 −0.00071
DCON (inch)	0 −0.00031	

INCH STANDARD

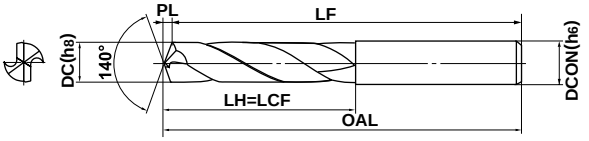
MZE (External coolant)



Type A



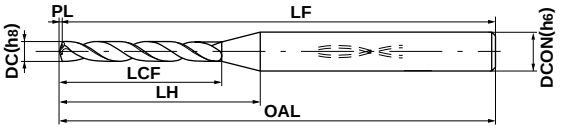
Type B



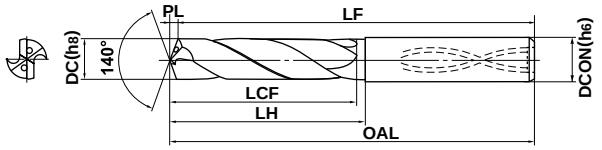
MZS (Internal coolant)



Type A



Type B



(Note) MICRO-MZE/MZS type can be used for shrink fit holders.

DC (inch)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (inch) LCF	LH	OAL	LF	PL	DCON	Type
.0394	2	Ext.	●	MZE00394SB	.243	.403	2.172	2.165	.007	.1250	A
	5	Int.	●	MZS00394LB	.440	.600	2.172	2.165	.007	.1250	A
.0400	2	Ext.	●	MZE00400SB	.283	.442	2.172	2.165	.007	.1250	A
	5	Int.	●	MZS00400LB	.676	.835	2.172	2.165	.007	.1250	A
.0410	2	Ext.	●	MZE00410SB	.284	.441	2.173	2.165	.008	.1250	A
	5	Int.	●	MZS00410LB	.677	.834	2.173	2.165	.008	.1250	A
.0420	2	Ext.	●	MZE00420SB	.284	.439	2.173	2.165	.008	.1250	A
	5	Int.	●	MZS00420LB	.677	.834	2.173	2.165	.008	.1250	A
.0430	2	Ext.	●	MZE00430SB	.284	.437	2.173	2.165	.008	.1250	A
	5	Int.	●	MZS00430LB	.677	.830	2.173	2.165	.008	.1250	A
.0465	2	Ext.	●	MZE00465SB	.323	.469	2.173	2.165	.008	.1250	A
	5	Int.	●	MZS00465LB	.677	.823	2.173	2.165	.008	.1250	A
.0520	2	Ext.	●	MZE00520SB	.363	.499	2.174	2.165	.009	.1250	A
	5	Int.	●	MZS00520LB	.678	.814	2.174	2.165	.009	.1250	A
.0550	2	Ext.	●	MZE00550SB	.364	.495	2.175	2.165	.010	.1250	A
	5	Int.	●	MZS00550LB	.679	.810	2.175	2.165	.010	.1250	A
.0591	2	Ext.	●	MZE00591SB	.365	.488	2.176	2.165	.011	.1250	A
	5	Int.	●	MZS00591LB	.680	.803	2.176	2.165	.011	.1250	A
.0625	2	Ext.	●	MZE00625SB	.405	.522	2.176	2.165	.011	.1250	A
	5	Int.	●	MZS00625LB	.877	.994	2.688	2.677	.011	.1250	A
.0635	2	Ext.	●	MZE00635SB	.405	.520	2.176	2.165	.011	.1250	A
	5	Int.	●	MZS00635LB	.877	.992	2.688	2.677	.011	.1250	A
.0670	2	Ext.	●	MZE00670SB	.445	.553	2.177	2.165	.012	.1250	A
	5	Int.	●	MZS00670LB	.878	.986	2.689	2.677	.012	.1250	A
.0700	2	Ext.	●	MZE00700SB	.446	.549	2.178	2.165	.013	.1250	A
	5	Int.	●	MZS00700LB	.879	.982	2.690	2.677	.013	.1250	A

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained.

DC (inch)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (inch) LCF	LH	OAL	LF	PL	DCON	Type
.0730	2	Ext.	●	**MZE00730SB**	.446	.543	2.178	2.165	.013	.1250	A
	5	Int.	●	**MZS00730LB**	.879	.976	2.690	2.677	.013	.1250	A
.0760	2	Ext.	●	**MZE00760SB**	.447	.538	2.179	2.165	.014	.1250	A
	5	Int.	●	**MZS00760LB**	.880	.971	2.691	2.677	.014	.1250	A
.0785	2	Ext.	●	**MZE00785SB**	.447	.534	2.179	2.165	.014	.1250	A
	5	Int.	●	**MZS00785LB**	.880	.967	2.691	2.677	.014	.1250	A
.0810	2	Ext.	●	**MZE00810SB**	.645	.727	2.180	2.165	.015	.1250	A
	5	Int.	●	**MZS00810LB**	1.117	1.199	2.928	2.913	.015	.1250	A
.0860	2	Ext.	●	**MZE00860SB**	.646	.719	2.181	2.165	.016	.1250	A
	5	Int.	●	**MZS00860LB**	1.118	1.191	2.929	2.913	.016	.1250	A
.0890	2	Ext.	●	**MZE00890SB**	.646	.713	2.181	2.165	.016	.1250	A
	5	Int.	●	**MZS00890LB**	1.118	1.185	2.929	2.913	.016	.1250	A
.0938	2	Ext.	●	**MZE00938SB**	.647	.705	2.182	2.165	.017	.1250	A
	5	Int.	●	**MZS00938LB**	1.119	1.177	2.930	2.913	.017	.1250	A
.0960	2	Ext.	●	**MZE00960SB**	.647	.701	2.182	2.165	.017	.1250	A
	5	Int.	●	**MZS00960LB**	1.119	1.173	2.930	2.913	.017	.1250	A
.1010	2	Ext.	●	**MZE01010SB**	.649	.649	2.184	2.165	.019	.1250	B
	5	Int.	●	**MZS01010LB**	1.318	1.318	3.208	3.189	.019	.1250	B
.1040	2	Ext.	●	**MZE01040SB**	.649	.649	2.184	2.165	.019	.1250	B
	5	Int.	●	**MZS01040LB**	1.318	1.318	3.208	3.189	.019	.1250	B
.1060	2	Ext.	●	**MZE01060SB**	.649	.649	2.184	2.165	.019	.1250	B
	5	Int.	●	**MZS01060LB**	1.318	1.318	3.208	3.189	.019	.1250	B
.1094	2	Ext.	●	**MZE01094SB**	.650	.650	2.185	2.165	.020	.1250	B
	5	Int.	●	**MZS01094LB**	1.319	1.319	3.209	3.189	.020	.1250	B
.1200	2	Ext.	●	**MZE01200SB**	.731	.731	2.187	2.165	.022	.1250	B
	5	Int.	●	**MZS01200LB**	1.557	1.557	3.447	3.425	.022	.1250	B

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

CUTTING CONDITIONS ➤ L159
TECHNICAL DATA ➤ N001

MICRO-MZE/MZS

Tolerance		DC<2	2≤DC<3
DC (mm)		0 −0.014	0 −0.014
DCON (mm)	MZE	0 −0.006	0 −0.014
	MZS	0 −0.006	0 −0.006

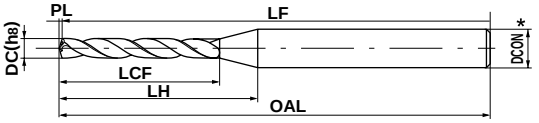
METRIC STANDARD

MZE (External coolant)

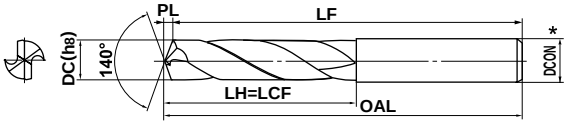


∗DCON<2 : h6
DCON≥2 : h8

Type A



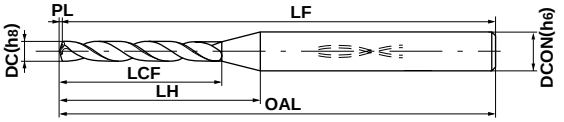
Type B



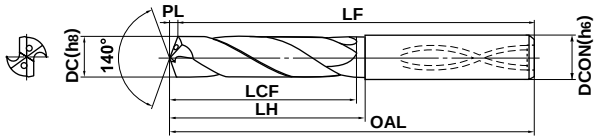
MZS (Internal coolant)



Type A



Type B



(Note 1) MICRO-MZE···SB type can be used for shrink fit holders.
(Note 2) MICRO-MZS type can be used for shrink fit holders.

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
1.0	2	Ext.	★	MZE0100SB	10.6	12.6	59.6	55	4.6	2.0	A
	5	Int.	★	MZS0100LB	15.6	19.6	59.6	55	4.6	3.0	A
1.1	2	Ext.	★	MZE0110SB	12.1	14.1	60.1	55	5.1	2.0	A
	5	Int.	★	MZS0110LB	22.1	26.1	60.1	55	5.1	3.0	A
1.2	2	Ext.	★	MZE0120SB	13.6	14.6	60.6	55	5.6	2.0	A
	5	Int.	★	MZS0120LB	22.6	25.6	60.6	55	5.6	3.0	A
1.3	2	Ext.	★	MZE0130SB	14.0	15.0	61.0	55	6.0	2.0	A
	5	Int.	★	MZS0130LB	23.0	26.0	61.0	55	6.0	3.0	A
1.4	2	Ext.	★	MZE0140SB	15.5	16.5	61.5	55	6.5	2.0	A
	5	Int.	★	MZS0140LB	23.5	26.5	61.5	55	6.5	3.0	A
1.5	2	Ext.	★	MZE0150SB	15.9	16.9	61.9	55	6.9	2.0	A
	5	Int.	★	MZS0150LB	23.9	26.9	61.9	55	6.9	3.0	A
1.6	2	Ext.	★	MZE0160SB	17.4	17.4	62.4	55	7.4	2.0	B
	5	Int.	★	MZS0160LB	29.4	32.4	75.4	68	7.4	3.0	A
1.7	2	Ext.	★	MZE0170SB	17.9	17.9	62.9	55	7.9	2.0	B
	5	Int.	★	MZS0170LB	29.9	31.9	75.9	68	7.9	3.0	A
1.8	2	Ext.	★	MZE0180SB	19.3	19.3	63.3	55	8.3	2.0	B
	5	Int.	★	MZS0180LB	30.3	32.3	76.3	68	8.3	3.0	A
1.9	2	Ext.	★	MZE0190SB	19.8	19.8	63.8	55	8.8	2.0	B
	5	Int.	★	MZS0190LB	30.8	32.8	76.8	68	8.8	3.0	A
2.0	2	Ext.	★	MZE0200SA	21.2	21.2	64.2	55	9.2	2.0	B
	3	Ext.	★	MZE0200MA	25.2	25.2	64.2	55	9.2	2.0	B
	3	Int.	★	MZS0200MB	25.2	27.2	71.2	62	9.2	3.0	A
	5	Int.	★	MZS0200LB	31.2	33.2	77.2	68	9.2	3.0	A
2.1	2	Ext.	★	MZE0210SA	21.7	21.7	64.7	55	9.7	2.1	B
	3	Ext.	★	MZE0210MA	25.7	25.7	64.7	55	9.7	2.1	B
	5	Int.	★	MZS0210LB	37.7	39.7	83.7	74	9.7	3.0	A

● : Inventory maintained. ★ : Inventory maintained in Japan.

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
2.2	2	Ext.	★	**MZE0220SA**	23.2	23.2	65.2	55	10.2	2.2	B
	3	Ext.	★	**MZE0220MA**	28.2	28.2	65.2	55	10.2	2.2	B
	5	Int.	★	**MZS0220LB**	38.2	39.2	84.2	74	10.2	3.0	A
2.3	2	Ext.	★	**MZE0230SA**	23.6	23.6	65.6	55	10.6	2.3	B
	3	Ext.	★	**MZE0230MA**	28.6	28.6	65.6	55	10.6	2.3	B
	3	Int.	★	**MZS0230MB**	30.6	31.6	76.6	66	10.6	3.0	A
	5	Int.	●	**MZS0230LB**	38.6	39.6	84.6	74	10.6	3.0	A
2.4	2	Ext.	●	**MZE0240SA**	27.1	27.1	66.1	55	11.1	2.4	B
	3	Ext.	★	**MZE0240MA**	31.1	31.1	66.1	55	11.1	2.4	B
	3	Int.	★	**MZS0240MB**	31.1	32.1	77.1	66	11.1	3.0	A
	5	Int.	●	**MZS0240LB**	39.1	40.1	85.1	74	11.1	3.0	A
2.5	2	Ext.	●	**MZE0250SA**	27.6	27.6	66.6	55	11.6	2.5	B
	3	Ext.	★	**MZE0250MA**	31.6	31.6	66.6	55	11.6	2.5	B
	3	Int.	★	**MZS0250MB**	31.6	32.6	77.6	66	11.6	3.0	A
	5	Int.	●	**MZS0250LB**	39.6	40.6	85.6	74	11.6	3.0	A
2.6	2	Ext.	★	**MZE0260SA**	28.0	28.0	67.0	55	12.0	2.6	B
	3	Ext.	★	**MZE0260MA**	32.0	32.0	67.0	55	12.0	2.6	B
	3	Int.	★	**MZS0260MB**	36.0	36.0	84.0	72	12.0	3.0	B
	5	Int.	★	**MZS0260LB**	45.0	45.0	93.0	81	12.0	3.0	B
2.7	2	Ext.	★	**MZE0270SA**	28.5	28.5	67.5	55	12.5	2.7	B
	3	Ext.	★	**MZE0270MA**	32.5	32.5	67.5	55	12.5	2.7	B
	3	Int.	★	**MZS0270MB**	36.5	36.5	84.5	72	12.5	3.0	B
	5	Int.	★	**MZS0270LB**	45.5	45.5	93.5	81	12.5	3.0	B
2.8	2	Ext.	●	**MZE0280SA**	28.9	28.9	67.9	55	12.9	2.8	B
	3	Ext.	★	**MZE0280MA**	33.9	33.9	72.9	60	12.9	2.8	B
	3	Int.	★	**MZS0280MB**	36.9	36.9	84.9	72	12.9	3.0	B
	5	Int.	●	**MZS0280LB**	45.9	45.9	93.9	81	12.9	3.0	B
2.9	2	Ext.	●	**MZE0290SA**	29.4	29.4	68.4	55	13.4	2.9	B
	3	Ext.	★	**MZE0290MA**	34.4	34.4	73.4	60	13.4	2.9	B
	3	Int.	★	**MZS0290MB**	37.4	37.4	85.4	72	13.4	3.0	B
	5	Int.	●	**MZS0290LB**	46.4	46.4	94.4	81	13.4	3.0	B

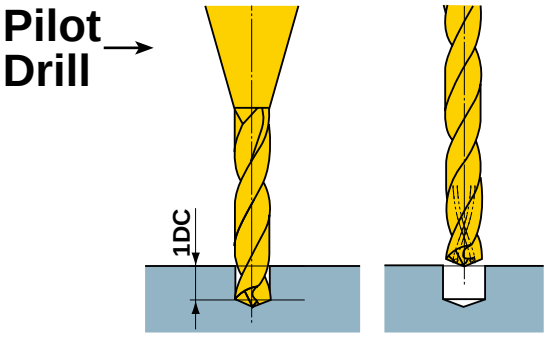
CUTTING CONDITIONS ➤ L159
TECHNICAL DATA ➤ N001

MICRO-MZE/MZS

SPECIAL APPLICATION NOTES

- For safety and success, always pre-drill the hole with a pilot drill. This is especially true for drilling small sizes less than **.1200" [2.9mm].**

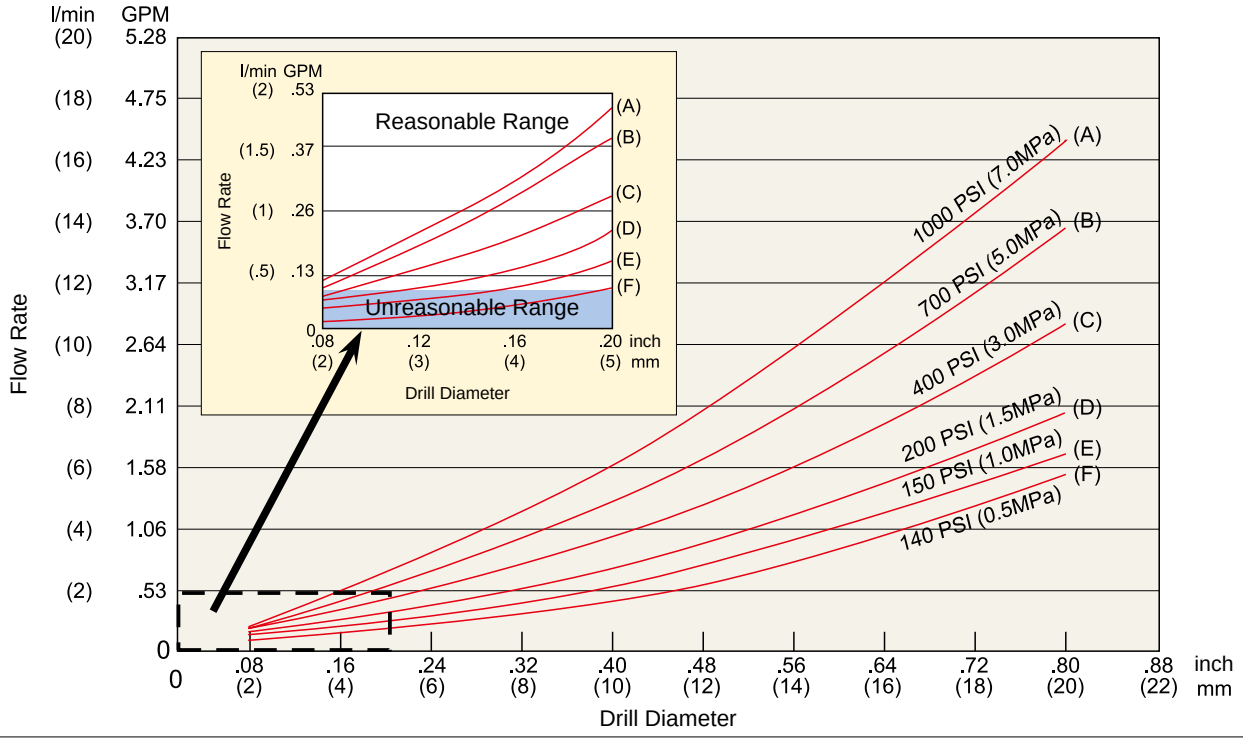
① A pilot hole must proceed application of LB drill.
② Use a SB drill with the same diameter for pilot hole.
③ Depending on cutting conditions peck feeding may be necessary.



- Minimum coolant pressure = **800psi** (5.5 MPa).
- Coolant must have Extreme Pressure **(EP)** Additives.
- Positive displacement type coolant pump is required.
- Coolant filter must be less than **5 microns**. Fine filtration is necessary to prevent blockage of the coolant Holes.

REASONABLE COOLANT FLOW AND PRESSURE FOR MZS DRILLS

Flow Rate and Pressure



PERFORMANCE REQUIREMENTS

In order for micro MZS Drills to perform properly you must satisfy the following requirements.

1. High pressure pump system **(800 psi or greater)**
2. Filter to **5 microns**
3. Runout <.0003 max.
4. Coolant with Extreme Pressure additives
5. Use MZE pilot drill
6. Recommended for rotating drill applications

RECOMMENDED CUTTING CONDITIONS

MZE (External coolant)

Work Material	Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.	
Drill Dia. **DC**	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch / mm				
.0394 / 1.0	130 (100—150)	.0014 (.0008—.0020)	115 (80—130)	.0014 (.0008—.0020)
.0472 / 1.2	130 (100—150)	.0018 (.0012—.0024)	115 (80—130)	.0018 (.0012—.0024)
.0630 / 1.6	150 (115—165)	.0022 (.0014—.0031)	130 (100—150)	.0022 (.0014—.0031)
.0787 / 2.0	150 (115—165)	.0028 (.0016—.0039)	130 (100—150)	.0028 (.0016—.0039)
.0984 / 2.5	150 (115—165)	.0033 (.0020—.0049)	130 (100—150)	.0033 (.0020—.0049)
.1181 / 3.0	150 (115—165)	.0039 (.0024—.0051)	130 (100—150)	.0039 (.0024—.0051)

Work Material	Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.	
Drill Dia. **DC**	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch / mm				
.0394 / 1.0	100 (65—115)	.0014 (.0008—.0020)	50 (35—65)	.0012 (.0008—.0017)
.0472 / 1.2	100 (65—115)	.0018 (.0012—.0024)	50 (35—65)	.0016 (.0012—.0021)
.0630 / 1.6	115 (80—130)	.0022 (.0014—.0031)	65 (50—80)	.0020 (.0014—.0028)
.0787 / 2.0	115 (80—130)	.0028 (.0016—.0039)	65 (50—80)	.0024 (.0016—.0031)
.0984 / 2.5	115 (80—130)	.0033 (.0020—.0049)	65 (50—80)	.0030 (.0020—.0039)
.1181 / 3.0	115 (80—130)	.0039 (.0024—.0047)	65 (50—80)	.0031 (.0020—.0031)

Work Material	Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-40-8 etc.	
Drill Dia. **DC**	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch / mm				
.0394 / 1.0	150 (115—165)	.0014 (.0008—.0020)	130 (100—150)	.0014 (.0008—.0020)
.0472 / 1.2	150 (115—165)	.0018 (.0012—.0024)	130 (100—150)	.0018 (.0012—.0024)
.0630 / 1.6	165 (130—180)	.0022 (.0014—.0031)	150 (115—165)	.0022 (.0014—.0031)
.0787 / 2.0	165 (130—180)	.0028 (.0016—.0039)	150 (115—165)	.0028 (.0016—.0039)
.0984 / 2.5	165 (130—180)	.0033 (.0020—.0049)	150 (115—165)	.0033 (.0020—.0049)
.1181 / 3.0	165 (130—180)	.0039 (.0024—.0051)	150 (115—165)	.0039 (.0024—.0051)

Work Material	Aluminium Alloy (Si<5%) ASTM A6061, A7075 etc.		Heat Resistant Alloy Inconel718 etc.	
Drill Dia. **DC**	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch / mm				
.0394 / 1.0	165 (130—180)	.0020 (.0012—.0030)	35 (15—50)	.0008 (.0006—.0011)
.0472 / 1.2	165 (130—180)	.0026 (.0018—.0035)	35 (15—50)	.0010 (.0009—.0013)
.0630 / 1.6	195 (150—230)	.0033 (.0021—.0047)	35 (15—50)	.0012 (.0010—.0016)
.0787 / 2.0	195 (150—230)	.0041 (.0024—.0059)	50 (35—65)	.0016 (.0013—.0020)
.0984 / 2.5	230 (180—260)	.0053 (.0030—.0079)	50 (35—65)	.0020 (.0016—.0024)
.1181 / 3.0	260 (195—295)	.0091 (.0024—.0051)	65 (50—80)	.0028 (.0020—.0035)

(Note) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MICRO-MZE/MZS

RECOMMENDED CUTTING CONDITIONS

MZE (External coolant)

Work Material	Hardened Steel (40—55HRC) AISI H13, L6 etc.	
Drill Dia. **DC**	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch / mm		
.0394 / 1.0	35 (15—50)	.0008 (.0006—.0012)
.0472 / 1.2	35 (15—50)	.0012 (.0009—.0015)
.0630 / 1.6	35 (15—50)	.0012 (.0010—.0016)
.0787 / 2.0	50 (35—65)	.0016 (.0013—.0020)
.0984 / 2.5	50 (35—65)	.0020 (.0016—.0024)
.1181 / 3.0	65 (50—80)	.0028 (.0020—.0035)

(Note) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

RECOMMENDED CUTTING CONDITIONS

MZS (Internal coolant)

Work Material	Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180−280HB) AISI 1045, 4140 etc.	
Drill Dia. **DC**	Cutting Speed (Min.−Max.) (SFM)	Feed (Min.−Max.) (IPR)	Cutting Speed (Min.−Max.) (SFM)	Feed (Min.−Max.) (IPR)
inch / mm				
.0394 / 1.0	130 (100—150)	.0014 (.0008−.0020)	95 (65—115)	.0014 (.0008−.0020)
.0472 / 1.2	130 (100—150)	.0018 (.0012−.0024)	95 (65—115)	.0018 (.0012−.0024)
.0630 / 1.6	150 (115—165)	.0022 (.0014−.0031)	110 (80—130)	.0022 (.0014−.0031)
.0787 / 2.0	165 (130—180)	.0028 (.0016−.0039)	130 (100—150)	.0028 (.0016−.0039)
.0984 / 2.5	165 (130—180)	.0033 (.0020−.0049)	145 (115—165)	.0033 (.0020−.0049)
.1181 / 3.0	260 (195—295)	.0039 (.0024−.0051)	225 (180—260)	.0039 (.0024−.0051)

Work Material	Carbon Steel, Alloy Steel (280−350HB) AISI 4340 etc.		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.	
Drill Dia. **DC**	Cutting Speed (Min.−Max.) (SFM)	Feed (Min.−Max.) (IPR)	Cutting Speed (Min.−Max.) (SFM)	Feed (Min.−Max.) (IPR)
inch / mm				
.0394 / 1.0	95 (65—115)	.0014 (.0008−.0020)	65 (50—80)	.0012 (.0008−.0017)
.0472 / 1.2	95 (65—115)	.0018 (.0012−.0024)	65 (50—80)	.0016 (.0012−.0021)
.0630 / 1.6	110 (80—130)	.0022 (.0014−.0031)	80 (65—100)	.0020 (.0014−.0028)
.0787 / 2.0	130 (100—150)	.0028 (.0016−.0039)	95 (65—115)	.0024 (.0016−.0031)
.0984 / 2.5	130 (100—150)	.0033 (.0020−.0049)	95 (65—115)	.0030 (.0020−.0039)
.1181 / 3.0	195 (150—230)	.0039 (.0024−.0051)	95 (65—115)	.0031 (.0024−.0039)

Work Material	Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-40-8 etc.	
Drill Dia. **DC**	Cutting Speed (Min.−Max.) (SFM)	Feed (Min.−Max.) (IPR)	Cutting Speed (Min.−Max.) (SFM)	Feed (Min.−Max.) (IPR)
inch / mm				
.0394 / 1.0	130 (100—150)	.0014 (.0008−.0020)	95 (65—115)	.0014 (.0008−.0020)
.0472 / 1.2	130 (100—150)	.0018 (.0012−.0024)	95 (65—115)	.0018 (.0012−.0024)
.0630 / 1.6	145 (115—165)	.0022 (.0014−.0031)	110 (80—130)	.0022 (.0014−.0031)
.0787 / 2.0	160 (130—180)	.0028 (.0016−.0039)	130 (100—150)	.0028 (.0016−.0039)
.0984 / 2.5	160 (130—180)	.0033 (.0020−.0049)	130 (100—150)	.0033 (.0020−.0049)
.1181 / 3.0	260 (195—295)	.0039 (.0024−.0051)	195 (150—230)	.0039 (.0024−.0051)

Work Material	Aluminium Alloy (Si<5%) AISI A6061, A7075 etc.		Heat Resistant Alloy Inconel718 etc.	
Drill Dia. **DC**	Cutting Speed (Min.−Max.) (SFM)	Feed (Min.−Max.) (IPR)	Cutting Speed (Min.−Max.) (SFM)	Feed (Min.−Max.) (IPR)
inch / mm				
.0394 / 1.0	195 (150—230)	.0020 (.0012−.0030)	30 (15—50)	.0008 (.0006−.0011)
.0472 / 1.2	195 (150—230)	.0026 (.0018−.0035)	30 (15—50)	.0010 (.0009−.0013)
.0630 / 1.6	225 (180—260)	.0033 (.0021−.0047)	30 (15—50)	.0012 (.0010−.0016)
.0787 / 2.0	225 (180—260)	.0041 (.0024−.0059)	30 (15—50)	.0016 (.0013−.0020)
.0984 / 2.5	260 (195—295)	.0053 (.0030−.0079)	30 (15—50)	.0020 (.0016−.0024)
.1181 / 3.0	325 (260—360)	.0091 (.0039−.0138)	45 (35—65)	.0028 (.0020−.0035)

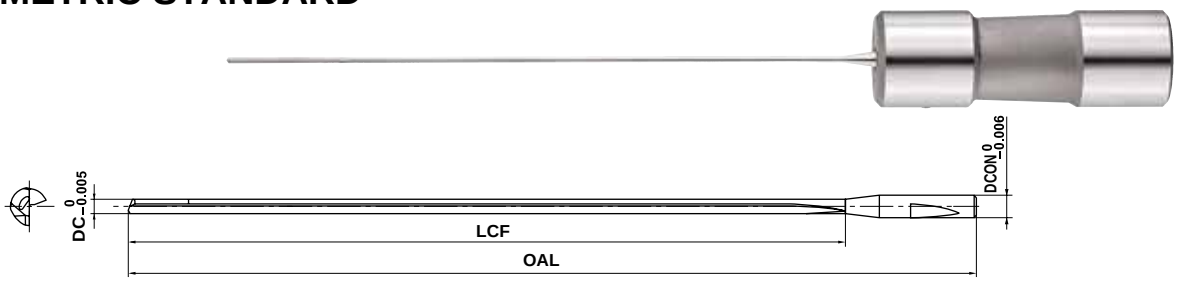
(Note) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MICRO-MGS

- Small diameter deep hole drilling.
- High hole accuracy is possible.
- Can be used with machining and turning center.

P M K N S H

METRIC STANDARD



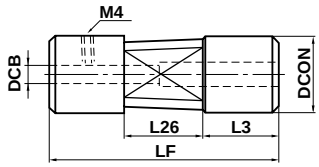
(Note) MGS type can be used for shrink fit holders.

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	DCON
0.7	50	Int.	★	MGS0070L040B	40	80	3
	80	Int.	★	MGS0070L060B	60	100	3
0.8	45	Int.	★	MGS0080L040B	40	80	3
	70	Int.	★	MGS0080L060B	60	100	3
0.9	40	Int.	★	MGS0090L040B	40	80	3
	60	Int.	★	MGS0090L060B	60	100	3
1.0	35	Int.	★	MGS0100L040B	40	80	3
	55	Int.	★	MGS0100L060B	60	100	3
	75	Int.	★	MGS0100L080B	80	120	3
1.1	30	Int.	★	MGS0110L040B	40	80	3
	50	Int.	★	MGS0110L060B	60	100	3
	65	Int.	★	MGS0110L080B	80	120	3
1.2	30	Int.	★	MGS0120L040B	40	80	3
	45	Int.	★	MGS0120L060B	60	100	3
	60	Int.	★	MGS0120L080B	80	120	3
1.3	40	Int.	★	MGS0130L060B	60	100	3
	55	Int.	★	MGS0130L080B	80	120	3
	70	Int.	★	MGS0130L100B	100	140	3
1.4	35	Int.	★	MGS0140L060B	60	100	3
	50	Int.	★	MGS0140L080B	80	120	3
	65	Int.	★	MGS0140L100B	100	140	3
1.5	35	Int.	★	MGS0150L060B	60	100	3
	50	Int.	★	MGS0150L080B	80	120	3
	60	Int.	★	MGS0150L100B	100	140	3
1.6	30	Int.	★	MGS0160L060B	60	100	3
	45	Int.	★	MGS0160L080B	80	120	3
	55	Int.	★	MGS0160L100B	100	140	3
1.7	30	Int.	★	MGS0170L060B	60	100	3
	40	Int.	★	MGS0170L080B	80	120	3
	55	Int.	★	MGS0170L100B	100	140	3
1.8	30	Int.	★	MGS0180L060B	60	100	3
	40	Int.	★	MGS0180L080B	80	120	3
	50	Int.	★	MGS0180L100B	100	140	3
1.9	25	Int.	★	MGS0190L060B	60	100	3
	35	Int.	★	MGS0190L080B	80	120	3
	45	Int.	★	MGS0190L100B	100	140	3
2.0	25	Int.	★	MGS0200L060B	60	100	3
	35	Int.	★	MGS0200L080B	80	120	3
	45	Int.	★	MGS0200L100B	100	140	3
2.1	35	Int.	★	MGS0210L080B	80	120	3
	40	Int.	★	MGS0210L100B	100	140	3
2.2	30	Int.	★	MGS0220L080B	80	120	3
	40	Int.	★	MGS0220L100B	100	140	3
2.3	30	Int.	★	MGS0230L080B	80	120	3
	40	Int.	★	MGS0230L100B	100	140	3
2.4	30	Int.	★	MGS0240L080B	80	120	3
	35	Int.	★	MGS0240L100B	100	140	3
2.5	25	Int.	★	MGS0250L080B	80	120	3
	35	Int.	★	MGS0250L100B	100	140	3
2.6	25	Int.	★	MGS0260L080B	80	120	3
	35	Int.	★	MGS0260L100B	100	140	3
2.7	25	Int.	★	MGS0270L080B	80	120	3
	30	Int.	★	MGS0270L100B	100	140	3
2.8	25	Int.	★	MGS0280L080B	80	120	3
	30	Int.	★	MGS0280L100B	100	140	3
2.9	20	Int.	★	MGS0290L080B	80	120	3
	30	Int.	★	MGS0290L100B	100	140	3
3.0	20	Int.	★	MGS0300L080B	80	120	3
	30	Int.	★	MGS0300L100B	100	140	3

(Note) Contact Mitsubishi Materials regarding coated products (***VP***, ***GP*** and ***UP*** coated carbide).

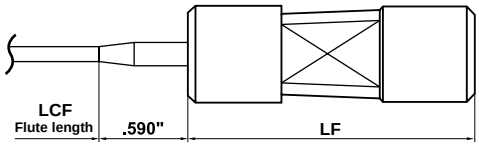
★ : Inventory maintained in Japan.

DRIVER



Order Number	Stock	Dimensions (inch)					Clamp Screw	Wrench
		DCON	DCB	LF	L3	L26		
MGD38	★	.500	.118	1.500	.496	.500	HSS04004	HKY20F
MGD70	★	.500	.118	2.756	.984	.787	HSS04004	HKY20F

When connected with a driver.



RECOMMENDED CUTTING CONDITIONS

Work Material		Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.0315	0.8	165 (130—195)	.0004 (.0002—.0006)	130 (100—165)	.0004 (.0002—.0006)
.0394	1.0	165 (130—195)	.0004 (.0003—.0008)	130 (100—165)	.0004 (.0003—.0008)
.0472	1.2	195 (150—245)	.0006 (.0003—.0009)	165 (130—195)	.0006 (.0003—.0009)
.0630	1.6	195 (150—245)	.0008 (.0004—.0013)	165 (130—195)	.0008 (.0004—.0013)
.0787	2.0	195 (150—245)	.0010 (.0005—.0016)	165 (130—195)	.0010 (.0005—.0016)
.0984	2.5	230 (180—280)	.0012 (.0007—.0020)	195 (150—245)	.0012 (.0007—.0020)
.1181	3.0	230 (180—280)	.0016 (.0008—.0024)	195 (150—245)	.0016 (.0008—.0024)

Work Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.0315	0.8	100 (65—130)	.0002 (.0002—.0002)	100 (65—130)	.0004 (.0002—.0006)
.0394	1.0	100 (65—130)	.0002 (.0002—.0003)	100 (65—130)	.0004 (.0003—.0008)
.0472	1.2	130 (100—165)	.0002 (.0002—.0003)	100 (65—130)	.0006 (.0003—.0009)
.0630	1.6	130 (100—165)	.0004 (.0003—.0004)	130 (100—165)	.0008 (.0004—.0013)
.0787	2.0	130 (100—165)	.0004 (.0004—.0005)	130 (100—165)	.0010 (.0005—.0016)
.0984	2.5	165 (130—195)	.0006 (.0005—.0007)	130 (100—165)	.0012 (.0007—.0020)
.1181	3.0	165 (130—195)	.0006 (.0006—.0008)	130 (100—165)	.0016 (.0008—.0024)

(Note 1) A pilot hole or guide bushing is required.
(Note 2) Coolant filter must be less than 5 microns. Fine filtration is necessary to prevent blockage of the coolant holes.
(Note 3) For safety and success, high pressure coolant is required. **(Minimum coolant pressure = 1,000PSI)**
(Note 4) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

HOW TO USE ➤ L164
TECHNICAL DATA ➤ N001

MICRO-MGS

Work Material		Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-40-8 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.0315	0.8	165 (130—195)	.0004 (.0003—.0006)	130 (100—165)	.0002 (.0002—.0003)
.0394	1.0	165 (130—195)	.0006 (.0004—.0008)	130 (100—165)	.0002 (.0003—.0004)
.0472	1.2	195 (150—245)	.0006 (.0005—.0009)	165 (130—195)	.0004 (.0003—.0005)
.0630	1.6	195 (150—245)	.0008 (.0006—.0013)	165 (130—195)	.0004 (.0004—.0006)
.0787	2.0	195 (150—245)	.0012 (.0008—.0016)	165 (130—195)	.0006 (.0005—.0008)
.0984	2.5	230 (180—280)	.0014 (.0010—.0020)	195 (150—245)	.0008 (.0007—.0010)
.1181	3.0	230 (180—280)	.0018 (.0012—.0024)	195 (150—245)	.0010 (.0008—.0012)

Work Material		Aluminium Alloy (Si<5%) ASTM A6061, 7075 etc.		Copper, Copper alloys	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.0315	0.8	165 (130—195)	.0004 (.0003—.0006)	130 (100—165)	.0004 (.0003—.0006)
.0394	1.0	195 (150—245)	.0006 (.0004—.0008)	165 (130—195)	.0006 (.0004—.0008)
.0472	1.2	230 (180—280)	.0006 (.0005—.0009)	195 (150—245)	.0006 (.0005—.0009)
.0630	1.6	260 (195—330)	.0008 (.0006—.0013)	230 (180—280)	.0008 (.0006—.0013)
.0787	2.0	295 (230—360)	.0012 (.0008—.0016)	260 (195—330)	.0012 (.0008—.0016)
.0984	2.5	330 (260—395)	.0014 (.0010—.0020)	295 (230—360)	.0014 (.0010—.0020)
.1181	3.0	330 (260—395)	.0018 (.0012—.0024)	330 (260—395)	.0018 (.0012—.0024)

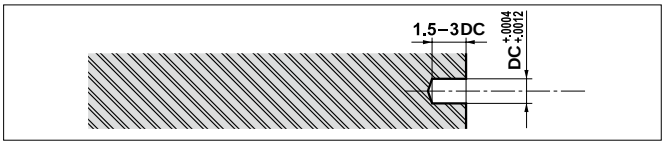
(Note 1) A pilot hole or guide bushing is required.
(Note 2) Coolant filter must be less than **5 microns**. Fine filtration is necessary to prevent blockage of the coolant holes.
(Note 3) For safety and success, high pressure coolant is required. **(Minimum coolant pressure = 1,000PSI)**
(Note 4) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

Special Application Notes :

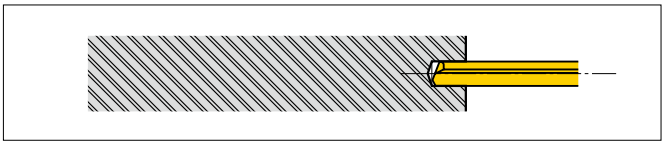
- For safety and success, high pressure coolant is required. **(Minimum coolant pressure = 1000PSI)**
- Coolant filter must be less than **5 microns**. Fine filtration is necessary to prevent blockage of the coolant holes.
- A pilot hole or guide bushing is required.

HOW TO USE

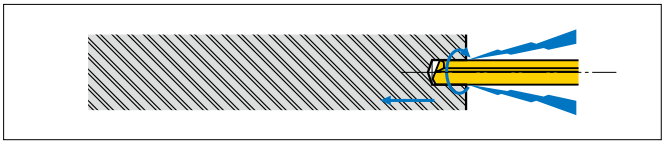
1. Pilot hole drilling.
(Mitsubishi's MZE, MZS, MWE or MWS is recommended.)



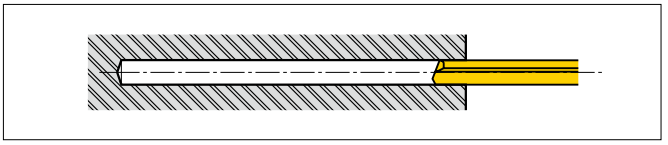
2. Drill is inserted into the pilot hole with the MGS drill rotation stopped or rotating CCW at 300rpm or less.
(Drill is not rotating.)



3. Coolant is turned ON, raise cutting speed and feed to the recommended cutting condition.



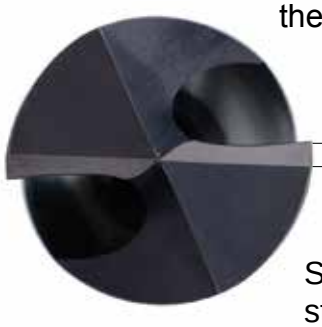
4. Return to "Pos 2" after drilling end, coolant turned OFF and drill rotation is stopped.



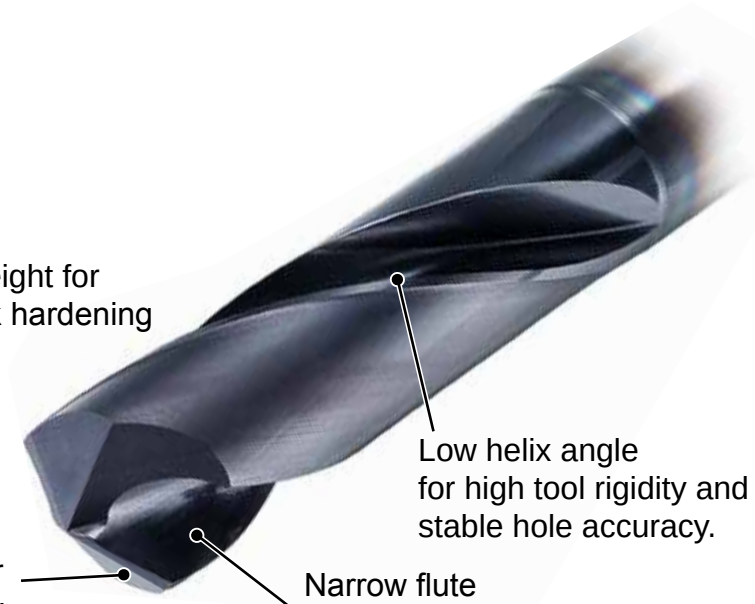
MHE (Drill for WHEEL HUB)

- **Designed for machining of wheel hub.**
- **Drill diameter range : From .394" to .591"**
- **Drill length : For 1 x DC (DC:Drill diameter)**
- **Non stock, produced as special order only.**

FEATURES



Lower cutting edge height for the prevention of work hardening



Low helix angle for high tool rigidity and stable hole accuracy.

Small point angle for stable hole accuracy

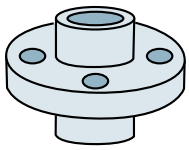
Narrow flute for better chip control.

RECOMMENDED CUTTING CONDITIONS

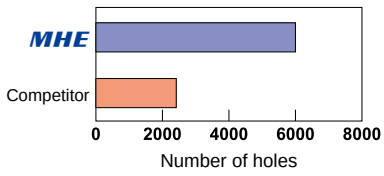
Work Material		Hardness	ϕ.394" – ϕ.591"	
			Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel	<180HB	245 (195–295)	.010 (.006–.012)

(Note) The above cutting conditions should be used as a guide and need to be adjusted according to the machine rigidity, workpiece clamping and shape.

APPLICATION EXAMPLES

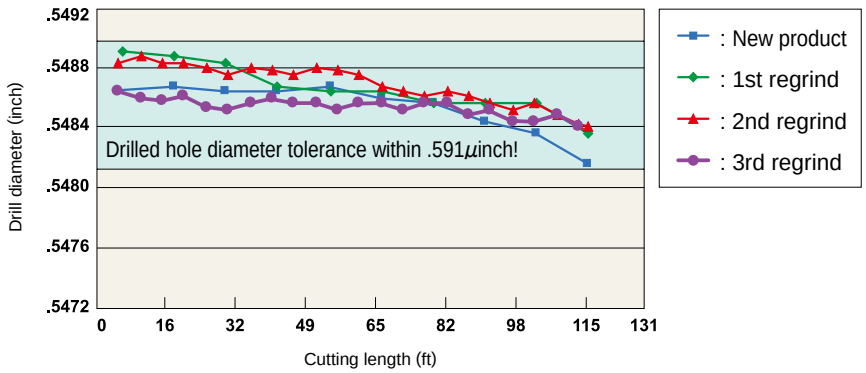


Tool : ϕ.500" x 4" x ϕ.500"
Component : Hub
Workpiece : Carbon steel
Cutting speed : 195 SFM
Feed : .006 IPR
Coolant : WSO



CUTTING PERFORMANCE

Hole Accuracy



Chip Geometry



Chip breaking properties
The workpiece surface is not damaged due to the fine chips that were generated.

DRILLING

MCS

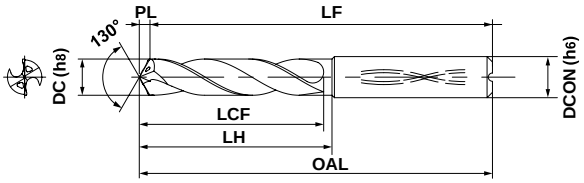
- For high accuracy and efficient drilling of CFRP.
- Unique diamond coating produces, excellent wear resistance and smooth hole surface.

CFRP	CFRP with Aluminum stack
◎	◎

Tolerance	.1719≤DC≤.1915	.2510≤DC≤.3765	.4380≤DC≤.5010
DC (inch)	$^{0}_{-0.00071}$	$^{0}_{-0.00087}$	$^{0}_{-0.00106}$
DCON (inch)	$^{0}_{-0.00031}$	$^{0}_{-0.00035}$	$^{0}_{-0.00043}$

INCH STANDARD





(Note) MCS type can be used for shrink fit holders.

DC (inch)	Hole Depth (l/d)	Coolant	Stock DD2010	Order Number	Dimensions (inch) LCF	LH	OAL	LF	PL	DCON
.1719	3	Int.	★	**MCS01719X3DB**	.946	1.142	2.599	2.559	.040	.2362
.1915	3	Int.	★	**MCS01915X3DB**	1.108	1.147	2.604	2.559	.045	.2362
.2510	3	Int.	★	**MCS02510X3DB**	1.358	1.673	3.130	3.071	.059	.3150
.3125	3	Int.	★	**MCS03125X3DB**	1.648	1.687	3.144	3.071	.073	.3150
.3760	3	Int.	★	**MCS03760X3DB**	1.860	1.899	3.513	3.425	.088	.3937
.3765	3	Int.	★	**MCS03765X3DB**	1.860	1.899	3.513	3.425	.088	.3937
.4380	3	Int.	★	**MCS04380X3DB**	2.189	2.228	4.039	3.937	.102	.4724
.5010	3	Int.	★	**MCS05010X3DB**	2.401	2.440	4.251	4.134	.117	.5512

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan.

TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

DD2010

Work Material		CFRP		Stacking board of CFRP and Aluminum alloy ASTM A7075 etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
.1719	4.366	280 (180—360)	.0016 (.0012—.0031)	180 (115—230)	.0016 (.0012—.0024)
.1915	4.864	280 (180—360)	.0016 (.0012—.0031)	180 (115—230)	.0016 (.0012—.0024)
.2510	6.375	310 (215—395)	.0020 (.0012—.0039)	215 (150—260)	.0020 (.0012—.0028)
.3125	7.938	310 (215—395)	.0020 (.0012—.0039)	215 (150—260)	.0020 (.0012—.0028)
.3760	9.550	310 (215—395)	.0028 (.0016—.0047)	215 (150—260)	.0024 (.0016—.0031)
.3765	9.563	310 (215—395)	.0028 (.0016—.0047)	215 (150—260)	.0024 (.0016—.0031)
.4380	11.125	330 (230—395)	.0039 (.0020—.0059)	230 (150—295)	.0028 (.0020—.0039)
.5010	12.725	330 (230—395)	.0039 (.0020—.0059)	230 (150—295)	.0031 (.0020—.0047)

TF15

Work Material		Stacking board of CFRP and Titanium alloy Ti-6Al-4V etc.	
Drill Dia. **DC**		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm		
.1719	4.366	25 (15—35)	.0012 (.0008—.0016)
.1915	4.864	25 (15—35)	.0012 (.0008—.0016)
.2510	6.375	25 (15—35)	.0012 (.0008—.0016)
.3125	7.938	25 (15—35)	.0012 (.0008—.0016)
.3760	9.550	35 (15—50)	.0016 (.0012—.0020)
.3765	9.563	35 (15—50)	.0016 (.0012—.0020)
.4380	11.125	35 (15—50)	.0016 (.0012—.0020)
.5010	12.725	35 (15—50)	.0016 (.0012—.0020)

(Note) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MVX NEW

P M K N S H

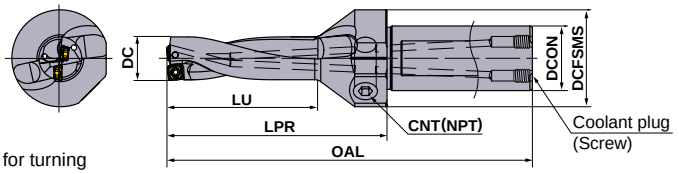
INCH STANDARD

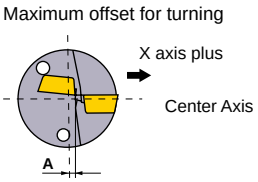
Internal Coolant



Machining tolerance (guide)(inch)

L/D	ø.687"–ø1.312"	ø1.375"–ø1.812"	ø1.875"–ø2.500"
2DC, 3DC	0 +0.0098	0 +0.0118	0 +0.0118
4DC, 5DC	0 +0.0138	0 +0.0157	0 +0.0177
6DC	0 +0.0177	0 +0.0236	





DC (inch)	Hole Depth (L/D)	Holder Order Number	Stock	Number of Inserts	Dimensions LU (inch)	LPR (inch)	OAL (inch)	DCON (inch)	DCFSMS (inch)	A (in.)	Insert Order Number	* Clamp Screw	① ② Wrench	NPT Plug (Side) CNT	Coolant Plug (Screw)	Coolant Plug (Wrench)
	2	MVX0687X2C100	●	2	1.65	2.72	4.97	1.000	1.50	.023	SOMX063005-○○	TPS25	①TIP07F	1/8	HSS05006	HKY25R
	3	MVX0687X3C100	●	2	2.34	3.41	5.66	1.000	1.50	.023	SOMX063005-○○	TPS25	①TIP07F	1/8	HSS05006	HKY25R
.687	4	MVX0687X4C100	●	2	3.03	4.09	6.34	1.000	1.50	.023	SOMX063005-○○	TPS25	①TIP07F	1/8	HSS05006	HKY25R
	5	MVX0687X5C100	●	2	3.71	4.78	7.03	1.000	1.50	.023	SOMX063005-○○	TPS25	①TIP07F	1/8	HSS05006	HKY25R
	6	MVX0687X6C100	●	2	4.40	5.47	7.72	1.000	1.50	.023	SOMX063005-○○	TPS25	①TIP07F	1/8	HSS05006	HKY25R
	2	MVX0750X2C100	●	2	1.78	2.91	5.16	1.000	1.50	.016	SOMX063005-○○	TPS25	①TIP07F	1/8	HSS05006	HKY25R
	3	MVX0750X3C100	●	2	2.53	3.66	5.91	1.000	1.50	.016	SOMX063005-○○	TPS25	①TIP07F	1/8	HSS05006	HKY25R
.750	4	MVX0750X4C100	●	2	3.28	4.41	6.66	1.000	1.50	.016	SOMX063005-○○	TPS25	①TIP07F	1/8	HSS05006	HKY25R
	5	MVX0750X5C100	●	2	4.03	5.16	7.41	1.000	1.50	.016	SOMX063005-○○	TPS25	①TIP07F	1/8	HSS05006	HKY25R
	6	MVX0750X6C100	●	2	4.78	5.91	8.16	1.000	1.50	.016	SOMX063005-○○	TPS25	①TIP07F	1/8	HSS05006	HKY25R
	2	MVX0812X2C100	●	2	1.90	3.01	5.26	1.000	1.50	.027	SOMX073505-○○	TPS3	①TIP10F	1/8	HSS05006	HKY25R
	3	MVX0812X3C100	●	2	2.71	3.82	6.07	1.000	1.50	.027	SOMX073505-○○	TPS3	①TIP10F	1/8	HSS05006	HKY25R
.812	4	MVX0812X4C100	●	2	3.53	4.63	6.88	1.000	1.50	.027	SOMX073505-○○	TPS3	①TIP10F	1/8	HSS05006	HKY25R
	5	MVX0812X5C100	●	2	4.34	5.44	7.69	1.000	1.50	.027	SOMX073505-○○	TPS3	①TIP10F	1/8	HSS05006	HKY25R
	6	MVX0812X6C100	●	2	5.15	6.26	8.51	1.000	1.50	.027	SOMX073505-○○	TPS3	①TIP10F	1/8	HSS05006	HKY25R
	2	MVX0875X2C100	●	2	2.03	3.12	5.37	1.000	1.50	.020	SOMX073505-○○	TPS3	①TIP10F	1/8	HSS05006	HKY25R
	3	MVX0875X3C100	●	2	2.90	4.00	6.25	1.000	1.50	.020	SOMX073505-○○	TPS3	①TIP10F	1/8	HSS05006	HKY25R
.875	4	MVX0875X4C100	●	2	3.78	4.87	7.12	1.000	1.50	.020	SOMX073505-○○	TPS3	①TIP10F	1/8	HSS05006	HKY25R
	5	MVX0875X5C100	●	2	4.65	5.75	8.00	1.000	1.50	.020	SOMX073505-○○	TPS3	①TIP10F	1/8	HSS05006	HKY25R
	6	MVX0875X6C100	●	2	5.53	6.62	8.87	1.000	1.50	.020	SOMX073505-○○	TPS3	①TIP10F	1/8	HSS05006	HKY25R
	2	MVX0937X2C100	●	2	2.15	3.24	5.49	1.000	1.50	.037	SOMX084005-○○	TPS351	②TIP10W	1/8	HSS05006	HKY25R
	3	MVX0937X3C100	●	2	3.09	4.17	6.42	1.000	1.50	.037	SOMX084005-○○	TPS351	②TIP10W	1/8	HSS05006	HKY25R
.937	4	MVX0937X4C100	●	2	4.03	5.11	7.36	1.000	1.50	.037	SOMX084005-○○	TPS351	②TIP10W	1/8	HSS05006	HKY25R
	5	MVX0937X5C100	●	2	4.96	6.05	8.30	1.000	1.50	.037	SOMX084005-○○	TPS351	②TIP10W	1/8	HSS05006	HKY25R
	6	MVX0937X6C100	●	2	5.90	6.99	9.24	1.000	1.50	.037	SOMX084005-○○	TPS351	②TIP10W	1/8	HSS05006	HKY25R
	2	MVX1000X2C125	●	2	2.28	3.35	5.73	1.250	1.75	.030	SOMX084005-○○	TPS351	②TIP10W	1/8	HSS06008	HKY30R
	3	MVX1000X3C125	●	2	3.28	4.35	6.73	1.250	1.75	.030	SOMX084005-○○	TPS351	②TIP10W	1/8	HSS06008	HKY30R
1.000	4	MVX1000X4C125	●	2	4.28	5.35	7.73	1.250	1.75	.030	SOMX084005-○○	TPS351	②TIP10W	1/8	HSS06008	HKY30R
	5	MVX1000X5C125	●	2	5.28	6.35	8.73	1.250	1.75	.030	SOMX084005-○○	TPS351	②TIP10W	1/8	HSS06008	HKY30R
	6	MVX1000X6C125	●	2	6.28	7.35	9.73	1.250	1.75	.030	SOMX084005-○○	TPS351	②TIP10W	1/8	HSS06008	HKY30R

* Clamp Torque (lbf-in) : TIP07F=8.9, TIP10F=17.7, TIP10W=22

● : Inventory maintained.

DC	Hole Depth	Holder Order Number	Stock	Number of Inserts	Dimensions					A	Insert Order Number	*		NPT Plug (Side)		
					LU	LPR	OAL	DCON	DCFSMS							
(inch)	(L/D)				inch	inch	inch	inch	inch	(in.)		Clamp Screw	Wrench	CNT	Coolant Plug (Screw)	Coolant Plug (Wrench)
	2	**MVX1062X2C125**	●	2	2.40	3.46	5.84	1.250	1.75	.022	**SOMX084005-**○○	TPS351	TIP10W	1/8	HSS06008	HKY30R
	3	MVX**1062X3C125**	●	2	3.46	4.53	6.90	1.250	1.75	.022	SOMX**084005-**○○	TPS351	TIP10W	1/8	HSS06008	HKY30R
1.062	4	MVX**1062X4C125**	●	2	4.53	5.59	7.96	1.250	1.75	.022	SOMX**084005-**○○	TPS351	TIP10W	1/8	HSS06008	HKY30R
	5	MVX**1062X5C125**	●	2	5.59	6.65	9.03	1.250	1.75	.022	SOMX**084005-**○○	TPS351	TIP10W	1/8	HSS06008	HKY30R
	6	MVX**1062X6C125**	●	2	6.65	7.71	10.09	1.250	1.75	.022	SOMX**084005-**○○	TPS351	TIP10W	1/8	HSS06008	HKY30R
	2	MVX**1125X2C125**	●	2	2.53	3.64	6.01	1.250	1.75	.040	SOMX**094506-**○○	TPS4	TIP15W	1/8	HSS06008	HKY30R
	3	MVX**1125X3C125**	●	2	3.65	4.76	7.14	1.250	1.75	.040	SOMX**094506-**○○	TPS4	TIP15W	1/8	HSS06008	HKY30R
1.125	4	MVX**1125X4C125**	●	2	4.78	5.89	8.26	1.250	1.75	.040	SOMX**094506-**○○	TPS4	TIP15W	1/8	HSS06008	HKY30R
	5	MVX**1125X5C125**	●	2	5.90	7.01	9.39	1.250	1.75	.040	SOMX**094506-**○○	TPS4	TIP15W	1/8	HSS06008	HKY30R
	6	MVX**1125X6C125**	●	2	7.03	8.14	10.51	1.250	1.75	.040	SOMX**094506-**○○	TPS4	TIP15W	1/8	HSS06008	HKY30R
	2	MVX**1187X2C125**	●	2	2.65	3.75	6.13	1.250	1.75	.033	SOMX**094506-**○○	TPS4	TIP15W	1/8	HSS06008	HKY30R
	3	MVX**1187X3C125**	●	2	3.84	4.94	7.32	1.250	1.75	.033	SOMX**094506-**○○	TPS4	TIP15W	1/8	HSS06008	HKY30R
1.187	4	MVX**1187X4C125**	●	2	5.03	6.13	8.51	1.250	1.75	.033	SOMX**094506-**○○	TPS4	TIP15W	1/8	HSS06008	HKY30R
	5	MVX**1187X5C125**	●	2	6.21	7.32	9.69	1.250	1.75	.033	SOMX**094506-**○○	TPS4	TIP15W	1/8	HSS06008	HKY30R
	6	MVX**1187X6C125**	●	2	7.40	8.51	10.88	1.250	1.75	.033	SOMX**094506-**○○	TPS4	TIP15W	1/8	HSS06008	HKY30R
	2	MVX**1250X2C150**	●	2	2.78	3.87	6.62	1.500	2.00	.025	SOMX**094506-**○○	TPS4	TIP15W	1/8	HSS06008	HKY30R
	3	MVX**1250X3C150**	●	2	4.03	5.12	7.87	1.500	2.00	.025	SOMX**094506-**○○	TPS4	TIP15W	1/8	HSS06008	HKY30R
1.250	4	MVX**1250X4C150**	●	2	5.28	6.37	9.12	1.500	2.00	.025	SOMX**094506-**○○	TPS4	TIP15W	1/8	HSS06008	HKY30R
	5	MVX**1250X5C150**	●	2	6.53	7.62	10.37	1.500	2.00	.025	SOMX**094506-**○○	TPS4	TIP15W	1/8	HSS06008	HKY30R
	6	MVX**1250X6C150**	●	2	7.78	8.87	11.62	1.500	2.00	.025	SOMX**094506-**○○	TPS4	TIP15W	1/8	HSS06008	HKY30R
	2	MVX**1312X2C150**	●	2	2.90	4.40	7.15	1.500	2.00	.049	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	3	MVX**1312X3C150**	●	2	4.21	5.71	8.46	1.500	2.00	.049	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
1.312	4	MVX**1312X4C150**	●	2	5.53	7.02	9.77	1.500	2.00	.049	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	5	MVX**1312X5C150**	●	2	6.84	8.33	11.08	1.500	2.00	.049	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	6	MVX**1312X6C150**	●	2	8.15	9.65	12.40	1.500	2.00	.049	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	2	MVX**1375X2C150**	●	2	3.03	4.52	7.27	1.500	2.00	.041	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	3	MVX**1375X3C150**	●	2	4.40	5.90	8.65	1.500	2.00	.041	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
1.375	4	MVX**1375X4C150**	●	2	5.78	7.27	10.02	1.500	2.00	.041	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	5	MVX**1375X5C150**	●	2	7.15	8.65	11.40	1.500	2.00	.041	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	6	MVX**1375X6C150**	●	2	8.53	10.02	12.77	1.500	2.00	.041	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	2	MVX**1437X2C150**	●	2	3.15	4.65	7.40	1.500	2.00	.036	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	3	MVX**1437X3C150**	●	2	4.59	6.08	8.83	1.500	2.00	.036	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
1.437	4	MVX**1437X4C150**	●	2	6.03	7.52	10.27	1.500	2.00	.036	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	5	MVX**1437X5C150**	●	2	7.46	8.96	11.71	1.500	2.00	.036	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	6	MVX**1437X6C150**	●	2	8.90	10.40	13.15	1.500	2.00	.036	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	2	MVX**1500X2C150**	●	2	3.28	4.77	7.52	1.500	2.00	.031	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	3	MVX**1500X3C150**	●	2	4.78	6.27	9.02	1.500	2.00	.031	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
1.500	4	MVX**1500X4C150**	●	2	6.28	7.77	10.52	1.500	2.00	.031	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	5	MVX**1500X5C150**	●	2	7.78	9.27	12.02	1.500	2.00	.031	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	6	MVX**1500X6C150**	●	2	9.28	10.77	13.52	1.500	2.00	.031	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	2	MVX**1562X2C150**	●	2	3.40	4.90	7.65	1.500	2.00	.021	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	3	MVX**1562X3C150**	●	2	4.96	6.46	9.21	1.500	2.00	.021	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
1.562	4	MVX**1562X4C150**	●	2	6.53	8.02	10.77	1.500	2.00	.021	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	5	MVX**1562X5C150**	●	2	8.09	9.58	12.33	1.500	2.00	.021	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R
	6	MVX**1562X6C150**	●	2	9.65	11.15	13.90	1.500	2.00	.021	SOMX**115506-**○○	TPS43	TIP15W	1/4	HSS08010	HKY40R

* Clamp Torque (lbf-in) : TIP10W=22, TIP15W=31

INSERTS ➤ L171
CUTTING CONDITIONS ➤ L180
TECHNICAL DATA ➤ N001

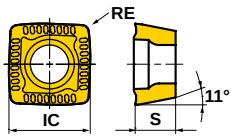
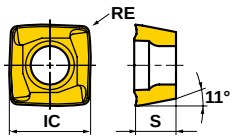
MVX NEW

DC (inch)	Hole Depth (L/D)	Holder Order Number	Stock	Number of Inserts	Dimensions LU inch	LPR inch	OAL inch	DCON inch	DCFSMS inch	A (in.)	Insert Order Number	* Clamp Screw	①② Wrench	NPT Plug (Side) CNT	Coolant Plug (Screw)	Coolant Plug (Wrench)
	2	**MVX1625X2C150**	●	2	3.53	5.02	7.77	1.500	2.00	.053	**SOMX136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
	3	MVX**1625X3C150**	●	2	5.15	6.65	9.40	1.500	2.00	.053	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
1.625	4	MVX**1625X4C150**	●	2	6.78	8.27	11.02	1.500	2.00	.053	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
	5	MVX**1625X5C150**	●	2	8.40	9.90	12.65	1.500	2.00	.053	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
	6	MVX**1625X6C150**	●	2	10.03	11.52	14.27	1.500	2.00	.053	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
	2	MVX**1687X2C150**	●	2	3.65	5.15	7.90	1.500	2.00	.047	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
	3	MVX**1687X3C150**	●	2	5.34	6.83	9.58	1.500	2.00	.047	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
1.687	4	MVX**1687X4C150**	●	2	7.03	8.52	11.27	1.500	2.00	.047	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
	5	MVX**1687X5C150**	●	2	8.71	10.21	12.96	1.500	2.00	.047	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
	6	MVX**1687X6C150**	●	2	10.40	11.90	14.65	1.500	2.00	.047	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
	2	MVX**1750X2C150**	●	2	3.78	5.27	8.02	1.500	2.00	.041	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
1.750	3	MVX**1750X3C150**	●	2	5.53	7.02	9.77	1.500	2.00	.041	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
	4	MVX**1750X4C150**	●	2	7.28	8.77	11.52	1.500	2.00	.041	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
	5	MVX**1750X5C150**	●	2	9.03	10.52	13.27	1.500	2.00	.041	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
	2	MVX**1812X2C150**	●	2	3.90	5.40	8.15	1.500	2.00	.031	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
1.812	3	MVX**1812X3C150**	●	2	5.71	7.21	9.96	1.500	2.00	.031	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
	4	MVX**1812X4C150**	●	2	7.53	9.02	11.77	1.500	2.00	.031	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
	5	MVX**1812X5C150**	●	2	9.34	10.83	13.58	1.500	2.00	.031	SOMX**136008-○○**	TPS43	①TIP15W	1/4	HSS08010	HKY40R
	2	MVX**1875X2C150**	●	2	4.03	5.60	8.35	1.500	2.48	.072	SOMX**166508-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
1.875	3	MVX**1875X3C150**	●	2	5.90	7.48	10.23	1.500	2.48	.072	SOMX**166508-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	4	MVX**1875X4C150**	●	2	7.78	9.35	12.10	1.500	2.48	.072	SOMX**166508-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	5	MVX**1875X5C150**	●	2	9.65	11.23	13.98	1.500	2.48	.072	SOMX**166508-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	2	MVX**1937X2C150**	●	2	4.15	5.73	8.48	1.500	2.48	.066	SOMX**166508-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
1.937	3	MVX**1937X3C150**	●	2	6.09	7.66	10.41	1.500	2.48	.066	SOMX**166508-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	4	MVX**1937X4C150**	●	2	8.03	9.60	12.35	1.500	2.48	.066	SOMX**166508-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	5	MVX**1937X5C150**	●	2	9.96	11.54	14.29	1.500	2.48	.066	SOMX**166508-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	2	MVX**2000X2C150**	●	2	4.28	5.85	8.60	1.500	2.48	.060	SOMX**166508-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
2.000	3	MVX**2000X3C150**	●	2	6.28	7.85	10.60	1.500	2.48	.060	SOMX**166508-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	4	MVX**2000X4C150**	●	2	8.28	9.85	12.60	1.500	2.48	.060	SOMX**166508-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	5	MVX**2000X5C150**	●	2	10.28	11.85	14.60	1.500	2.48	.060	SOMX**166508-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	2	MVX**2125X2C150**	●	2	4.53	6.10	8.85	1.500	2.48	.047	SOMX**166508-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
2.125	3	MVX**2125X3C150**	●	2	6.65	8.23	10.98	1.500	2.48	.047	SOMX**166508-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	4	MVX**2125X4C150**	●	2	8.78	10.35	13.10	1.500	2.48	.047	SOMX**166508-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	5	MVX**2125X5C150**	●	2	10.90	12.48	15.23	1.500	2.48	.047	SOMX**166508-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	2	MVX**2250X2C150**	●	2	4.78	6.35	9.10	1.500	2.68	.057	SOMX**187008-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
2.250	3	MVX**2250X3C150**	●	2	7.03	8.60	11.35	1.500	2.68	.057	SOMX**187008-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	4	MVX**2250X4C150**	●	2	9.28	10.85	13.60	1.500	2.68	.057	SOMX**187008-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	5	MVX**2250X5C150**	●	2	11.53	13.10	15.85	1.500	2.68	.057	SOMX**187008-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	2	MVX**2375X2C150**	●	2	5.03	6.60	9.35	1.500	2.68	.044	SOMX**187008-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
2.375	3	MVX**2375X3C150**	●	2	7.40	8.98	11.73	1.500	2.68	.044	SOMX**187008-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	4	MVX**2375X4C150**	●	2	9.78	11.35	14.10	1.500	2.68	.044	SOMX**187008-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	5	MVX**2375X5C150**	●	2	12.15	13.73	16.48	1.500	2.68	.044	SOMX**187008-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	2	MVX**2500X2C150**	●	2	5.28	6.85	9.60	1.500	2.68	.031	SOMX**187008-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
2.500	3	MVX**2500X3C150**	●	2	7.78	9.35	12.10	1.500	2.68	.031	SOMX**187008-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	4	MVX**2500X4C150**	●	2	10.28	11.85	14.60	1.500	2.68	.031	SOMX**187008-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R
	5	MVX**2500X5C150**	●	2	12.78	14.35	17.10	1.500	2.68	.031	SOMX**187008-○○**	TPS54	②TIP25D	1/4	HSS10012	HKY50R

* Clamp Torque (lbf-in) : TIP15W=31, TIP25D=66

● : **Inventory maintained.**

INSERTS

Shape	DC (inch)	Order Number	Dimensions (inch)			Stock			Geometry
			IC	S	RE	VP15TF	MC1020	MC5020	
UM	ø.687"–ø.750"	**SOMX063005-UM**	.236	.118	.020	●	●	●	
	ø.812"–ø.875"	SOMX**073505-UM**	.276	.138	.020	●	●	●	
	ø.937"–ø1.062"	SOMX**084005-UM**	.327	.157	.020	●	●	●	
	ø1.125"–ø1.250"	SOMX**094506-UM**	.382	.177	.024	●	●	●	
	ø1.312"–ø1.562"	SOMX**115506-UM**	.457	.217	.024	●	●	●	
	ø1.625"–ø1.812"	SOMX**136008-UM**	.543	.236	.031	●	●	●	
	ø1.875"–ø2.125"	SOMX**166508-UM**	.650	.256	.031	●	●	●	
General purpose	ø2.250"–ø2.500"	SOMX**187008-UM**	.717	.276	.031	●	●	●	
US	ø.687"–ø.750"	**SOMX063005-US**	.236	.118	.020	●	–	–	
	ø.812"–ø.875"	SOMX**073505-US**	.276	.138	.020	●	–	–	
	ø.937"–ø1.062"	SOMX**084005-US**	.327	.157	.020	●	–	–	
	ø1.125"–ø1.250"	SOMX**094506-US**	.382	.177	.024	●	–	–	
For stainless steel and inner edge									

✶MC1020 and MC5020 are the outer insert only.

DRILLING

CUTTING CONDITIONS ➤ L180
TECHNICAL DATA ➤ N001

MVX

P M K N S H

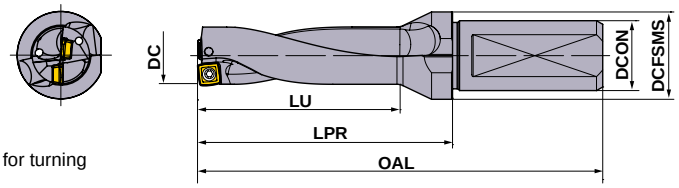
METRIC STANDARD

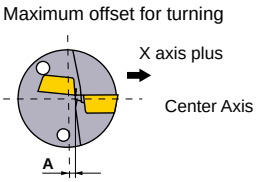
Internal Coolant



Machining tolerance (guide)(mm)

L/D	ø17.0–ø33.0	ø33.5–ø47.0	ø48.0–ø63.0
2DC, 3DC	0 +0.25	0 +0.3	0 +0.3
4DC, 5DC	0 +0.35	0 +0.4	0 +0.45
6DC	0 +0.45	0 +0.6	





Side Coolant Not Available.

DC Metric (mm)	Hole Depth (l/d)	Holder Order Number	Stock	Number of Inserts	Dimensions LU (mm)	LPR (mm)	OAL (mm)	DCON (mm)	DCFSMS (mm)	A (mm)	Insert Order Number	* Clamp Screw	Wrench
17.0	2	MVX1700X2F20	★	2	41	56	99	20.0	25	0.50	SOMX063005-○○	TPS25	TIP07F
	3	MVX1700X3F20	★	2	58	73	116	20.0	25	0.50	SOMX063005-○○	TPS25	TIP07F
	4	MVX1700X4F20	★	2	75	90	133	20.0	25	0.50	SOMX063005-○○	TPS25	TIP07F
	5	MVX1700X5F20	★	2	92	107	150	20.0	25	0.50	SOMX063005-○○	TPS25	TIP07F
	6	MVX1700X6F20	★	2	109	124	167	20.0	25	0.50	SOMX063005-○○	TPS25	TIP07F
17.5	2	MVX1750X2F25	★	2	42	62	112	25.0	32	0.45	SOMX063005-○○	TPS25	TIP07F
	3	MVX1750X3F25	★	2	59	79	129	25.0	32	0.45	SOMX063005-○○	TPS25	TIP07F
	4	MVX1750X4F25	★	2	77	97	147	25.0	32	0.45	SOMX063005-○○	TPS25	TIP07F
	5	MVX1750X5F25	★	2	94	114	164	25.0	32	0.45	SOMX063005-○○	TPS25	TIP07F
	6	MVX1750X6F25	★	2	112	132	182	25.0	32	0.45	SOMX063005-○○	TPS25	TIP07F
18.0	2	MVX1800X2F25	★	2	43	63	113	25.0	32	0.40	SOMX063005-○○	TPS25	TIP07F
	3	MVX1800X3F25	★	2	61	81	131	25.0	32	0.40	SOMX063005-○○	TPS25	TIP07F
	4	MVX1800X4F25	★	2	79	99	149	25.0	32	0.40	SOMX063005-○○	TPS25	TIP07F
	5	MVX1800X5F25	★	2	97	117	167	25.0	32	0.40	SOMX063005-○○	TPS25	TIP07F
	6	MVX1800X6F25	★	2	115	135	185	25.0	32	0.40	SOMX063005-○○	TPS25	TIP07F
18.5	2	MVX1850X2F25	★	2	44	64	114	25.0	32	0.35	SOMX063005-○○	TPS25	TIP07F
	3	MVX1850X3F25	★	2	62	82	132	25.0	32	0.35	SOMX063005-○○	TPS25	TIP07F
	4	MVX1850X4F25	★	2	81	101	151	25.0	32	0.35	SOMX063005-○○	TPS25	TIP07F
	5	MVX1850X5F25	★	2	99	119	169	25.0	32	0.35	SOMX063005-○○	TPS25	TIP07F
	6	MVX1850X6F25	★	2	118	138	188	25.0	32	0.35	SOMX063005-○○	TPS25	TIP07F
19.0	2	MVX1900X2F25	★	2	45	65	115	25.0	32	0.30	SOMX063005-○○	TPS25	TIP07F
	3	MVX1900X3F25	★	2	64	84	134	25.0	32	0.30	SOMX063005-○○	TPS25	TIP07F
	4	MVX1900X4F25	★	2	83	103	153	25.0	32	0.30	SOMX063005-○○	TPS25	TIP07F
	5	MVX1900X5F25	★	2	102	122	172	25.0	32	0.30	SOMX063005-○○	TPS25	TIP07F
	6	MVX1900X6F25	★	2	121	141	191	25.0	32	0.30	SOMX063005-○○	TPS25	TIP07F
19.5	2	MVX1950X2F25	★	2	46	66	116	25.0	32	0.25	SOMX063005-○○	TPS25	TIP07F
	3	MVX1950X3F25	★	2	65	85	135	25.0	32	0.25	SOMX063005-○○	TPS25	TIP07F
	4	MVX1950X4F25	★	2	85	105	155	25.0	32	0.25	SOMX063005-○○	TPS25	TIP07F
	5	MVX1950X5F25	★	2	104	124	174	25.0	32	0.25	SOMX063005-○○	TPS25	TIP07F
	6	MVX1950X6F25	★	2	124	144	194	25.0	32	0.25	SOMX063005-○○	TPS25	TIP07F

* Clamp Torque (lbf-in) : TIP07F=8.9

★ : Inventory maintained in Japan.

DC Metric (mm)	Hole Depth (l/d)	Holder Order Number	Stock	Number of Inserts	Dimensions LU (mm)	LPR (mm)	OAL (mm)	DCON (mm)	DCFSMS (mm)	A (mm)	Insert Order Number	* Clamp Screw	①② Wrench
20.0	2	**MVX2000X2F25**	★	2	47	67	117	25.0	32	0.60	**SOMX073505-○○**	TPS3	①TIP10F
	3	MVX**2000X3F25**	★	2	67	87	137	25.0	32	0.60	SOMX**073505-○○**	TPS3	①TIP10F
	4	MVX**2000X4F25**	★	2	87	107	157	25.0	32	0.60	SOMX**073505-○○**	TPS3	①TIP10F
	5	MVX**2000X5F25**	★	2	107	127	177	25.0	32	0.60	SOMX**073505-○○**	TPS3	①TIP10F
	6	MVX**2000X6F25**	★	2	127	147	197	25.0	32	0.60	SOMX**073505-○○**	TPS3	①TIP10F
20.5	2	MVX**2050X2F25**	★	2	48	68	118	25.0	32	0.55	SOMX**073505-○○**	TPS3	①TIP10F
	3	MVX**2050X3F25**	★	2	68	88	138	25.0	32	0.55	SOMX**073505-○○**	TPS3	①TIP10F
21.0	2	MVX**2100X2F25**	★	2	49	69	119	25.0	32	0.50	SOMX**073505-○○**	TPS3	①TIP10F
	3	MVX**2100X3F25**	★	2	70	90	140	25.0	32	0.50	SOMX**073505-○○**	TPS3	①TIP10F
	4	MVX**2100X4F25**	★	2	91	111	161	25.0	32	0.50	SOMX**073505-○○**	TPS3	①TIP10F
	5	MVX**2100X5F25**	★	2	112	132	182	25.0	32	0.50	SOMX**073505-○○**	TPS3	①TIP10F
	6	MVX**2100X6F25**	★	2	133	153	203	25.0	32	0.50	SOMX**073505-○○**	TPS3	①TIP10F
21.5	2	MVX**2150X2F25**	★	2	50	70	120	25.0	32	0.45	SOMX**073505-○○**	TPS3	①TIP10F
	3	MVX**2150X3F25**	★	2	71	91	141	25.0	32	0.45	SOMX**073505-○○**	TPS3	①TIP10F
22.0	2	MVX**2200X2F25**	★	2	51	71	121	25.0	32	0.40	SOMX**073505-○○**	TPS3	①TIP10F
	3	MVX**2200X3F25**	★	2	73	93	143	25.0	32	0.40	SOMX**073505-○○**	TPS3	①TIP10F
	4	MVX**2200X4F25**	★	2	95	115	165	25.0	32	0.40	SOMX**073505-○○**	TPS3	①TIP10F
	5	MVX**2200X5F25**	★	2	117	137	187	25.0	32	0.40	SOMX**073505-○○**	TPS3	①TIP10F
	6	MVX**2200X6F25**	★	2	139	159	209	25.0	32	0.40	SOMX**073505-○○**	TPS3	①TIP10F
22.5	2	MVX**2250X2F25**	★	2	52	72	122	25.0	32	0.35	SOMX**073505-○○**	TPS3	①TIP10F
	3	MVX**2250X3F25**	★	2	74	94	144	25.0	32	0.35	SOMX**073505-○○**	TPS3	①TIP10F
23.0	2	MVX**2300X2F25**	★	2	53	73	123	25.0	32	0.80	SOMX**084005-○○**	TPS351	②TIP10W
	3	MVX**2300X3F25**	★	2	76	96	146	25.0	32	0.80	SOMX**084005-○○**	TPS351	②TIP10W
	4	MVX**2300X4F25**	★	2	99	119	169	25.0	32	0.80	SOMX**084005-○○**	TPS351	②TIP10W
	5	MVX**2300X5F25**	★	2	122	142	192	25.0	32	0.80	SOMX**084005-○○**	TPS351	②TIP10W
	6	MVX**2300X6F25**	★	2	145	165	215	25.0	32	0.80	SOMX**084005-○○**	TPS351	②TIP10W
23.5	2	MVX**2350X2F25**	★	2	54	74	124	25.0	32	0.75	SOMX**084005-○○**	TPS351	②TIP10W
	3	MVX**2350X3F25**	★	2	77	97	147	25.0	32	0.75	SOMX**084005-○○**	TPS351	②TIP10W
24.0	2	MVX**2400X2F25**	★	2	55	75	125	25.0	32	0.70	SOMX**084005-○○**	TPS351	②TIP10W
	3	MVX**2400X3F25**	★	2	79	99	149	25.0	32	0.70	SOMX**084005-○○**	TPS351	②TIP10W
	4	MVX**2400X4F25**	★	2	103	123	173	25.0	32	0.70	SOMX**084005-○○**	TPS351	②TIP10W
	5	MVX**2400X5F25**	★	2	127	147	197	25.0	32	0.70	SOMX**084005-○○**	TPS351	②TIP10W
	6	MVX**2400X6F25**	★	2	151	171	221	25.0	32	0.70	SOMX**084005-○○**	TPS351	②TIP10W
24.5	2	MVX**2450X2F25**	★	2	56	76	126	25.0	32	0.65	SOMX**084005-○○**	TPS351	②TIP10W
	3	MVX**2450X3F25**	★	2	80	100	150	25.0	32	0.65	SOMX**084005-○○**	TPS351	②TIP10W
25.0	2	MVX**2500X2F25**	★	2	57	77	127	25.0	32	0.60	SOMX**084005-○○**	TPS351	②TIP10W
	3	MVX**2500X3F25**	★	2	82	102	152	25.0	32	0.60	SOMX**084005-○○**	TPS351	②TIP10W
	4	MVX**2500X4F25**	★	2	107	127	177	25.0	32	0.60	SOMX**084005-○○**	TPS351	②TIP10W
	5	MVX**2500X5F25**	★	2	132	152	202	25.0	32	0.60	SOMX**084005-○○**	TPS351	②TIP10W
	6	MVX**2500X6F25**	★	2	157	177	227	25.0	32	0.60	SOMX**084005-○○**	TPS351	②TIP10W
25.5	2	MVX**2550X2F25**	★	2	58	78	128	25.0	32	0.60	SOMX**084005-○○**	TPS351	②TIP10W
	3	MVX**2550X3F25**	★	2	83	103	153	25.0	32	0.60	SOMX**084005-○○**	TPS351	②TIP10W
26.0	2	MVX**2600X2F32**	★	2	59	79	134	32.0	42	0.50	SOMX**084005-○○**	TPS351	②TIP10W
	3	MVX**2600X3F32**	★	2	85	105	160	32.0	42	0.50	SOMX**084005-○○**	TPS351	②TIP10W
	4	MVX**2600X4F32**	★	2	111	131	186	32.0	42	0.50	SOMX**084005-○○**	TPS351	②TIP10W
	5	MVX**2600X5F32**	★	2	137	157	212	32.0	42	0.50	SOMX**084005-○○**	TPS351	②TIP10W
	6	MVX**2600X6F32**	★	2	163	183	238	32.0	42	0.50	SOMX**084005-○○**	TPS351	②TIP10W

* Clamp Torque (lbf-in) : TIP10F=17.7, TIP10W=22

INSERTS ➤ L179
CUTTING CONDITIONS ➤ L180
TECHNICAL DATA ➤ N001

MVX

DC Metric (mm)	Hole Depth (l/d)	Holder Order Number	Stock	Number of Inserts	Dimensions LU (mm)	LPR (mm)	OAL (mm)	DCON (mm)	DCFSMS (mm)	A (mm)	Insert Order Number	* Clamp Screw	Wrench
26.5	2	MVX2650X2F32	★	2	60	80	135	32.0	42	0.50	SOMX084005-○○	TPS351	TIP10W
	3	MVX2650X3F32	★	2	86	106	161	32.0	42	0.50	SOMX084005-○○	TPS351	TIP10W
27.0	2	MVX2700X2F32	★	2	61	81	136	32.0	42	0.45	SOMX084005-○○	TPS351	TIP10W
	3	MVX2700X3F32	★	2	88	108	163	32.0	42	0.45	SOMX084005-○○	TPS351	TIP10W
	4	MVX2700X4F32	★	2	115	135	190	32.0	42	0.45	SOMX084005-○○	TPS351	TIP10W
	5	MVX2700X5F32	★	2	142	162	217	32.0	42	0.45	SOMX084005-○○	TPS351	TIP10W
	6	MVX2700X6F32	★	2	169	189	244	32.0	42	0.45	SOMX084005-○○	TPS351	TIP10W
27.5	2	MVX2750X2F32	★	2	62	82	137	32.0	42	0.40	SOMX084005-○○	TPS351	TIP10W
	3	MVX2750X3F32	★	2	89	109	164	32.0	42	0.40	SOMX084005-○○	TPS351	TIP10W
28.0	2	MVX2800X2F32	★	2	63	83	138	32.0	42	0.85	SOMX094506-○○	TPS4	TIP15W
	3	MVX2800X3F32	★	2	91	111	166	32.0	42	0.85	SOMX094506-○○	TPS4	TIP15W
	4	MVX2800X4F32	★	2	119	139	194	32.0	42	0.85	SOMX094506-○○	TPS4	TIP15W
	5	MVX2800X5F32	★	2	147	167	222	32.0	42	0.85	SOMX094506-○○	TPS4	TIP15W
	6	MVX2800X6F32	★	2	175	195	250	32.0	42	0.85	SOMX094506-○○	TPS4	TIP15W
28.5	2	MVX2850X2F32	★	2	64	84	139	32.0	42	0.80	SOMX094506-○○	TPS4	TIP15W
	3	MVX2850X3F32	★	2	92	112	167	32.0	42	0.80	SOMX094506-○○	TPS4	TIP15W
29.0	2	MVX2900X2F32	★	2	65	85	140	32.0	42	0.75	SOMX094506-○○	TPS4	TIP15W
	3	MVX2900X3F32	★	2	94	114	169	32.0	42	0.75	SOMX094506-○○	TPS4	TIP15W
	4	MVX2900X4F32	★	2	123	143	198	32.0	42	0.75	SOMX094506-○○	TPS4	TIP15W
	5	MVX2900X5F32	★	2	152	172	227	32.0	42	0.75	SOMX094506-○○	TPS4	TIP15W
	6	MVX2900X6F32	★	2	181	201	256	32.0	42	0.75	SOMX094506-○○	TPS4	TIP15W
29.5	2	MVX2950X2F32	★	2	66	86	141	32.0	42	0.70	SOMX094506-○○	TPS4	TIP15W
	3	MVX2950X3F32	★	2	95	115	170	32.0	42	0.70	SOMX094506-○○	TPS4	TIP15W
30.0	2	MVX3000X2F32	★	2	67	87	142	32.0	42	0.65	SOMX094506-○○	TPS4	TIP15W
	3	MVX3000X3F32	★	2	97	117	172	32.0	42	0.65	SOMX094506-○○	TPS4	TIP15W
	4	MVX3000X4F32	★	2	127	147	202	32.0	42	0.65	SOMX094506-○○	TPS4	TIP15W
	5	MVX3000X5F32	★	2	157	177	232	32.0	42	0.65	SOMX094506-○○	TPS4	TIP15W
	6	MVX3000X6F32	★	2	187	207	262	32.0	42	0.65	SOMX094506-○○	TPS4	TIP15W
30.5	3	MVX3050X3F32	★	2	98	118	173	32.0	42	0.60	SOMX094506-○○	TPS4	TIP15W
31.0	2	MVX3100X2F40	★	2	69	89	154	40.0	50	0.55	SOMX094506-○○	TPS4	TIP15W
	3	MVX3100X3F40	★	2	100	120	185	40.0	50	0.55	SOMX094506-○○	TPS4	TIP15W
	4	MVX3100X4F40	★	2	131	151	216	40.0	50	0.55	SOMX094506-○○	TPS4	TIP15W
	5	MVX3100X5F40	★	2	162	182	247	40.0	50	0.55	SOMX094506-○○	TPS4	TIP15W
	6	MVX3100X6F40	★	2	193	213	278	40.0	50	0.55	SOMX094506-○○	TPS4	TIP15W
31.5	3	MVX3150X3F40	★	2	101	121	186	40.0	50	0.55	SOMX094506-○○	TPS4	TIP15W
32.0	2	MVX3200X2F40	★	2	71	91	156	40.0	50	0.45	SOMX094506-○○	TPS4	TIP15W
	3	MVX3200X3F40	★	2	103	123	188	40.0	50	0.45	SOMX094506-○○	TPS4	TIP15W
	4	MVX3200X4F40	★	2	135	155	220	40.0	50	0.45	SOMX094506-○○	TPS4	TIP15W
	5	MVX3200X5F40	★	2	167	187	252	40.0	50	0.45	SOMX094506-○○	TPS4	TIP15W
	6	MVX3200X6F40	★	2	199	219	284	40.0	50	0.45	SOMX094506-○○	TPS4	TIP15W
32.5	3	MVX3250X3F40	★	2	104	124	189	40.0	50	0.45	SOMX094506-○○	TPS4	TIP15W
33.0	2	MVX3300X2F40	★	2	73	93	158	40.0	50	0.40	SOMX094506-○○	TPS4	TIP15W
	3	MVX3300X3F40	★	2	106	126	191	40.0	50	0.40	SOMX094506-○○	TPS4	TIP15W
	4	MVX3300X4F40	★	2	139	159	224	40.0	50	0.40	SOMX094506-○○	TPS4	TIP15W
	5	MVX3300X5F40	★	2	172	192	257	40.0	50	0.40	SOMX094506-○○	TPS4	TIP15W
	6	MVX3300X6F40	★	2	205	225	290	40.0	50	0.40	SOMX094506-○○	TPS4	TIP15W

* Clamp Torque (lbf-in) : TIP10W=22, TIP15W=31

★ : Inventory maintained in Japan.

DC Metric (mm)	Hole Depth (l/d)	Holder Order Number	Stock	Number of Inserts	Dimensions LU (mm)	LPR (mm)	OAL (mm)	DCON (mm)	DCFSMS (mm)	A (mm)	Insert Order Number	* Clamp Screw	Wrench
33.5	3	**MVX3350X3F40**	★	2	107	127	192	40.0	50	1.15	**SOMX115506-○○**	TPS43	TIP15W
34.0	2	MVX**3400X2F40**	★	2	75	105	170	40.0	50	1.11	SOMX**115506-○○**	TPS43	TIP15W
	3	MVX**3400X3F40**	★	2	109	139	204	40.0	50	1.11	SOMX**115506-○○**	TPS43	TIP15W
	4	MVX**3400X4F40**	★	2	143	173	238	40.0	50	1.11	SOMX**115506-○○**	TPS43	TIP15W
	5	MVX**3400X5F40**	★	2	177	207	272	40.0	50	1.11	SOMX**115506-○○**	TPS43	TIP15W
	6	MVX**3400X6F40**	★	2	211	241	306	40.0	50	1.10	SOMX**115506-○○**	TPS43	TIP15W
34.5	3	MVX**3450X3F40**	★	2	110	140	205	40.0	50	1.08	SOMX**115506-○○**	TPS43	TIP15W
35.0	2	MVX**3500X2F40**	★	2	77	107	172	40.0	50	1.03	SOMX**115506-○○**	TPS43	TIP15W
	3	MVX**3500X3F40**	★	2	112	142	207	40.0	50	1.03	SOMX**115506-○○**	TPS43	TIP15W
	4	MVX**3500X4F40**	★	2	147	177	242	40.0	50	1.03	SOMX**115506-○○**	TPS43	TIP15W
	5	MVX**3500X5F40**	★	2	182	212	277	40.0	50	1.03	SOMX**115506-○○**	TPS43	TIP15W
	6	MVX**3500X6F40**	★	2	217	247	312	40.0	50	1.02	SOMX**115506-○○**	TPS43	TIP15W
35.5	3	MVX**3550X3F40**	★	2	113	143	208	40.0	50	0.99	SOMX**115506-○○**	TPS43	TIP15W
36.0	2	MVX**3600X2F40**	★	2	79	109	174	40.0	50	0.95	SOMX**115506-○○**	TPS43	TIP15W
	3	MVX**3600X3F40**	★	2	115	145	210	40.0	50	0.95	SOMX**115506-○○**	TPS43	TIP15W
	4	MVX**3600X4F40**	★	2	151	181	246	40.0	50	0.95	SOMX**115506-○○**	TPS43	TIP15W
	5	MVX**3600X5F40**	★	2	187	217	282	40.0	50	0.95	SOMX**115506-○○**	TPS43	TIP15W
	6	MVX**3600X6F40**	★	2	223	253	318	40.0	50	0.94	SOMX**115506-○○**	TPS43	TIP15W
37.0	2	MVX**3700X2F40**	★	2	81	111	176	40.0	50	0.87	SOMX**115506-○○**	TPS43	TIP15W
	3	MVX**3700X3F40**	★	2	118	148	213	40.0	50	0.87	SOMX**115506-○○**	TPS43	TIP15W
	4	MVX**3700X4F40**	★	2	155	185	250	40.0	50	0.87	SOMX**115506-○○**	TPS43	TIP15W
	5	MVX**3700X5F40**	★	2	192	222	287	40.0	50	0.87	SOMX**115506-○○**	TPS43	TIP15W
	6	MVX**3700X6F40**	★	2	229	259	324	40.0	50	0.86	SOMX**115506-○○**	TPS43	TIP15W
38.0	2	MVX**3800X2F40**	★	2	83	113	178	40.0	50	0.79	SOMX**115506-○○**	TPS43	TIP15W
	3	MVX**3800X3F40**	★	2	121	151	216	40.0	50	0.79	SOMX**115506-○○**	TPS43	TIP15W
	4	MVX**3800X4F40**	★	2	159	189	254	40.0	50	0.79	SOMX**115506-○○**	TPS43	TIP15W
	5	MVX**3800X5F40**	★	2	197	227	292	40.0	50	0.79	SOMX**115506-○○**	TPS43	TIP15W
	6	MVX**3800X6F40**	★	2	235	265	330	40.0	50	0.78	SOMX**115506-○○**	TPS43	TIP15W
39.0	2	MVX**3900X2F40**	★	2	85	115	180	40.0	50	0.71	SOMX**115506-○○**	TPS43	TIP15W
	3	MVX**3900X3F40**	★	2	124	154	219	40.0	50	0.71	SOMX**115506-○○**	TPS43	TIP15W
	4	MVX**3900X4F40**	★	2	163	193	258	40.0	50	0.71	SOMX**115506-○○**	TPS43	TIP15W
	5	MVX**3900X5F40**	★	2	202	232	297	40.0	50	0.71	SOMX**115506-○○**	TPS43	TIP15W
	6	MVX**3900X6F40**	★	2	241	271	336	40.0	50	0.70	SOMX**115506-○○**	TPS43	TIP15W
40.0	2	MVX**4000X2F40**	★	2	87	117	182	40.0	50	1.46	SOMX**136008-○○**	TPS43	TIP15W
	3	MVX**4000X3F40**	★	2	127	157	222	40.0	50	1.46	SOMX**136008-○○**	TPS43	TIP15W
	4	MVX**4000X4F40**	★	2	167	197	262	40.0	50	1.46	SOMX**136008-○○**	TPS43	TIP15W
	5	MVX**4000X5F40**	★	2	207	237	302	40.0	50	1.46	SOMX**136008-○○**	TPS43	TIP15W
	6	MVX**4000X6F40**	★	2	247	277	342	40.0	50	1.45	SOMX**136008-○○**	TPS43	TIP15W
41.0	2	MVX**4100X2F40**	★	2	89	119	184	40.0	50	1.36	SOMX**136008-○○**	TPS43	TIP15W
	3	MVX**4100X3F40**	★	2	130	160	225	40.0	50	1.36	SOMX**136008-○○**	TPS43	TIP15W
	4	MVX**4100X4F40**	★	2	171	201	266	40.0	50	1.36	SOMX**136008-○○**	TPS43	TIP15W
	5	MVX**4100X5F40**	★	2	212	242	307	40.0	50	1.36	SOMX**136008-○○**	TPS43	TIP15W
	6	MVX**4100X6F40**	★	2	253	283	348	40.0	50	1.35	SOMX**136008-○○**	TPS43	TIP15W

* Clamp Torque (lbf-in) : TIP15W=31

DRILLING

INSERTS ➤ L179
CUTTING CONDITIONS ➤ L180
TECHNICAL DATA ➤ N001

MVX

DC Metric (mm)	Hole Depth (l/d)	Holder Order Number	Stock	Number of Inserts	Dimensions LU (mm)	LPR (mm)	OAL (mm)	DCON (mm)	DCFSMS (mm)	A (mm)	Insert Order Number	* Clamp Screw	①② Wrench
42.0	2	**MVX4200X2F40**	★	2	91	121	186	40.0	50	1.27	**SOMX136008-○○**	TPS43	①TIP15W
	3	MVX**4200X3F40**	★	2	133	163	228	40.0	50	1.27	SOMX**136008-○○**	TPS43	①TIP15W
NEW	4	MVX**4200X4F40**	★	2	175	205	270	40.0	63	1.27	SOMX**136008-○○**	TPS43	①TIP15W
	4	MVX**4200X4F50**	★	2	175	205	280	50.0	63	1.27	SOMX**136008-○○**	TPS43	①TIP15W
NEW	5	MVX**4200X5F40**	★	2	217	247	312	40.0	63	1.27	SOMX**136008-○○**	TPS43	①TIP15W
	5	MVX**4200X5F50**	★	2	217	247	322	50.0	63	1.27	SOMX**136008-○○**	TPS43	①TIP15W
NEW	6	MVX**4200X6F40**	★	2	259	289	354	40.0	63	1.27	SOMX**136008-○○**	TPS43	①TIP15W
	6	MVX**4200X6F50**	★	2	259	289	364	50.0	63	1.26	SOMX**136008-○○**	TPS43	①TIP15W
43.0	2	MVX**4300X2F40**	★	2	93	123	188	40.0	50	1.18	SOMX**136008-○○**	TPS43	①TIP15W
	3	MVX**4300X3F40**	★	2	136	166	231	40.0	50	1.18	SOMX**136008-○○**	TPS43	①TIP15W
NEW	4	MVX**4300X4F40**	★	2	179	209	274	40.0	63	1.18	SOMX**136008-○○**	TPS43	①TIP15W
	4	MVX**4300X4F50**	★	2	179	209	284	50.0	63	1.18	SOMX**136008-○○**	TPS43	①TIP15W
NEW	5	MVX**4300X5F40**	★	2	222	252	317	40.0	63	1.18	SOMX**136008-○○**	TPS43	①TIP15W
	5	MVX**4300X5F50**	★	2	222	252	327	50.0	63	1.18	SOMX**136008-○○**	TPS43	①TIP15W
NEW	6	MVX**4300X6F40**	★	2	265	295	360	40.0	63	1.17	SOMX**136008-○○**	TPS43	①TIP15W
	6	MVX**4300X6F50**	★	2	265	295	370	50.0	63	1.17	SOMX**136008-○○**	TPS43	①TIP15W
44.0	2	MVX**4400X2F40**	★	2	95	125	190	40.0	50	1.08	SOMX**136008-○○**	TPS43	①TIP15W
	3	MVX**4400X3F40**	★	2	139	169	234	40.0	50	1.08	SOMX**136008-○○**	TPS43	①TIP15W
NEW	4	MVX**4400X4F40**	★	2	183	213	278	40.0	63	1.08	SOMX**136008-○○**	TPS43	①TIP15W
	4	MVX**4400X4F50**	★	2	183	213	288	50.0	63	1.08	SOMX**136008-○○**	TPS43	①TIP15W
NEW	5	MVX**4400X5F40**	★	2	227	257	322	40.0	63	1.08	SOMX**136008-○○**	TPS43	①TIP15W
	5	MVX**4400X5F50**	★	2	227	257	332	50.0	63	1.08	SOMX**136008-○○**	TPS43	①TIP15W
45.0	2	MVX**4500X2F40**	★	2	97	127	192	40.0	50	0.99	SOMX**136008-○○**	TPS43	①TIP15W
	3	MVX**4500X3F40**	★	2	142	172	237	40.0	50	0.99	SOMX**136008-○○**	TPS43	①TIP15W
NEW	4	MVX**4500X4F40**	★	2	187	217	282	40.0	63	0.99	SOMX**136008-○○**	TPS43	①TIP15W
	4	MVX**4500X4F50**	★	2	187	217	292	50.0	63	0.99	SOMX**136008-○○**	TPS43	①TIP15W
NEW	5	MVX**4500X5F40**	★	2	232	262	327	40.0	63	0.99	SOMX**136008-○○**	TPS43	①TIP15W
	5	MVX**4500X5F50**	★	2	232	262	337	50.0	63	0.99	SOMX**136008-○○**	TPS43	①TIP15W
46.0	2	MVX**4600X2F40**	★	2	99	129	194	40.0	50	0.89	SOMX**136008-○○**	TPS43	①TIP15W
	3	MVX**4600X3F40**	★	2	145	175	240	40.0	50	0.89	SOMX**136008-○○**	TPS43	①TIP15W
NEW	4	MVX**4600X4F40**	★	2	191	221	286	40.0	63	0.89	SOMX**136008-○○**	TPS43	①TIP15W
	4	MVX**4600X4F50**	★	2	191	221	296	50.0	63	0.89	SOMX**136008-○○**	TPS43	①TIP15W
NEW	5	MVX**4600X5F40**	★	2	237	267	332	40.0	63	0.89	SOMX**136008-○○**	TPS43	①TIP15W
	5	MVX**4600X5F50**	★	2	237	267	342	50.0	63	0.89	SOMX**136008-○○**	TPS43	①TIP15W
47.0	2	MVX**4700X2F40**	★	2	101	141	206	40.0	63	1.90	SOMX**166508-○○**	TPS54	②TIP25D
	3	MVX**4700X3F40**	★	2	148	188	253	40.0	63	1.90	SOMX**166508-○○**	TPS54	②TIP25D
NEW	4	MVX**4700X4F40**	★	2	195	235	300	40.0	63	1.90	SOMX**166508-○○**	TPS54	②TIP25D
	4	MVX**4700X4F50**	★	2	195	235	310	50.0	63	1.90	SOMX**166508-○○**	TPS54	②TIP25D
NEW	5	MVX**4700X5F40**	★	2	242	282	347	40.0	63	1.90	SOMX**166508-○○**	TPS54	②TIP25D
	5	MVX**4700X5F50**	★	2	242	282	357	50.0	63	1.90	SOMX**166508-○○**	TPS54	②TIP25D
48.0	2	MVX**4800X2F40**	★	2	103	143	208	40.0	63	1.80	SOMX**166508-○○**	TPS54	②TIP25D
	3	MVX**4800X3F40**	★	2	151	191	256	40.0	63	1.80	SOMX**166508-○○**	TPS54	②TIP25D
NEW	4	MVX**4800X4F40**	★	2	199	239	304	40.0	63	1.80	SOMX**166508-○○**	TPS54	②TIP25D
	4	MVX**4800X4F50**	★	2	199	239	314	50.0	63	1.80	SOMX**166508-○○**	TPS54	②TIP25D
NEW	5	MVX**4800X5F40**	★	2	247	287	352	40.0	63	1.80	SOMX**166508-○○**	TPS54	②TIP25D
	5	MVX**4800X5F50**	★	2	247	287	362	50.0	63	1.80	SOMX**166508-○○**	TPS54	②TIP25D

* Clamp Torque (lbf-in) : TIP15W=31, TIP25D=66

★ : Inventory maintained in Japan.

DC Metric (mm)	Hole Depth (l/d)	Holder Order Number	Stock	Number of Inserts	Dimensions LU (mm)	LPR (mm)	OAL (mm)	DCON (mm)	DCFSMS (mm)	A (mm)	Insert Order Number	* Clamp Screw	Wrench
49.0	2	**MVX4900X2F40**	★	2	105	145	210	40.0	63	1.70	**SOMX166508-○○**	TPS54	TIP25D
	3	MVX**4900X3F40**	★	2	154	194	259	40.0	63	1.70	SOMX**166508-○○**	TPS54	TIP25D
NEW	4	MVX**4900X4F40**	★	2	203	243	308	40.0	63	1.70	SOMX**166508-○○**	TPS54	TIP25D
	4	MVX**4900X4F50**	★	2	203	243	318	50.0	63	1.70	SOMX**166508-○○**	TPS54	TIP25D
NEW	5	MVX**4900X5F40**	★	2	252	292	357	40.0	63	1.70	SOMX**166508-○○**	TPS54	TIP25D
	5	MVX**4900X5F50**	★	2	252	292	367	50.0	63	1.70	SOMX**166508-○○**	TPS54	TIP25D
50.0	2	MVX**5000X2F40**	★	2	107	147	212	40.0	63	1.60	SOMX**166508-○○**	TPS54	TIP25D
	3	MVX**5000X3F40**	★	2	157	197	262	40.0	63	1.60	SOMX**166508-○○**	TPS54	TIP25D
NEW	4	MVX**5000X4F40**	★	2	207	247	312	40.0	63	1.60	SOMX**166508-○○**	TPS54	TIP25D
	4	MVX**5000X4F50**	★	2	207	247	322	50.0	63	1.60	SOMX**166508-○○**	TPS54	TIP25D
NEW	5	MVX**5000X5F40**	★	2	257	297	362	40.0	63	1.60	SOMX**166508-○○**	TPS54	TIP25D
	5	MVX**5000X5F50**	★	2	257	297	372	50.0	63	1.60	SOMX**166508-○○**	TPS54	TIP25D
51.0	2	MVX**5100X2F40**	★	2	109	149	214	40.0	63	1.50	SOMX**166508-○○**	TPS54	TIP25D
	3	MVX**5100X3F40**	★	2	160	200	265	40.0	63	1.50	SOMX**166508-○○**	TPS54	TIP25D
NEW	4	MVX**5100X4F40**	★	2	211	251	316	40.0	63	1.50	SOMX**166508-○○**	TPS54	TIP25D
	4	MVX**5100X4F50**	★	2	211	251	326	50.0	63	1.50	SOMX**166508-○○**	TPS54	TIP25D
NEW	5	MVX**5100X5F40**	★	2	262	302	367	40.0	63	1.50	SOMX**166508-○○**	TPS54	TIP25D
	5	MVX**5100X5F50**	★	2	262	302	377	50.0	63	1.50	SOMX**166508-○○**	TPS54	TIP25D
52.0	2	MVX**5200X2F40**	★	2	111	151	216	40.0	63	1.39	SOMX**166508-○○**	TPS54	TIP25D
	3	MVX**5200X3F40**	★	2	163	203	268	40.0	63	1.39	SOMX**166508-○○**	TPS54	TIP25D
NEW	4	MVX**5200X4F40**	★	2	215	255	320	40.0	63	1.39	SOMX**166508-○○**	TPS54	TIP25D
	4	MVX**5200X4F50**	★	2	215	255	330	50.0	63	1.39	SOMX**166508-○○**	TPS54	TIP25D
NEW	5	MVX**5200X5F40**	★	2	267	307	372	40.0	63	1.39	SOMX**166508-○○**	TPS54	TIP25D
	5	MVX**5200X5F50**	★	2	267	307	382	50.0	63	1.39	SOMX**166508-○○**	TPS54	TIP25D
53.0	2	MVX**5300X2F40**	★	2	113	153	218	40.0	63	1.29	SOMX**166508-○○**	TPS54	TIP25D
	3	MVX**5300X3F40**	★	2	166	206	271	40.0	63	1.29	SOMX**166508-○○**	TPS54	TIP25D
NEW	4	MVX**5300X4F40**	★	2	219	259	324	40.0	63	1.29	SOMX**166508-○○**	TPS54	TIP25D
	4	MVX**5300X4F50**	★	2	219	259	334	50.0	63	1.29	SOMX**166508-○○**	TPS54	TIP25D
NEW	5	MVX**5300X5F40**	★	2	272	312	377	40.0	63	1.29	SOMX**166508-○○**	TPS54	TIP25D
	5	MVX**5300X5F50**	★	2	272	312	387	50.0	63	1.29	SOMX**166508-○○**	TPS54	TIP25D
54.0	2	MVX**5400X2F40**	★	2	115	155	220	40.0	63	1.19	SOMX**166508-○○**	TPS54	TIP25D
	3	MVX**5400X3F40**	★	2	169	209	274	40.0	63	1.19	SOMX**166508-○○**	TPS54	TIP25D
NEW	4	MVX**5400X4F40**	★	2	223	263	328	40.0	63	1.19	SOMX**166508-○○**	TPS54	TIP25D
	4	MVX**5400X4F50**	★	2	223	263	338	50.0	63	1.19	SOMX**166508-○○**	TPS54	TIP25D
NEW	5	MVX**5400X5F40**	★	2	277	317	382	40.0	63	1.19	SOMX**166508-○○**	TPS54	TIP25D
	5	MVX**5400X5F50**	★	2	277	317	392	50.0	63	1.19	SOMX**166508-○○**	TPS54	TIP25D
55.0	2	MVX**5500X2F40**	★	2	117	157	222	40.0	63	1.08	SOMX**166508-○○**	TPS54	TIP25D
	3	MVX**5500X3F40**	★	2	172	212	277	40.0	63	1.08	SOMX**166508-○○**	TPS54	TIP25D
NEW	4	MVX**5500X4F40**	★	2	227	267	332	40.0	63	1.08	SOMX**166508-○○**	TPS54	TIP25D
	4	MVX**5500X4F50**	★	2	227	267	342	50.0	63	1.08	SOMX**166508-○○**	TPS54	TIP25D
NEW	5	MVX**5500X5F40**	★	2	282	322	387	40.0	63	1.08	SOMX**166508-○○**	TPS54	TIP25D
	5	MVX**5500X5F50**	★	2	282	322	397	50.0	63	1.08	SOMX**166508-○○**	TPS54	TIP25D
56.0	2	MVX**5600X2F40**	★	2	119	159	224	40.0	63	0.98	SOMX**166508-○○**	TPS54	TIP25D
	3	MVX**5600X3F40**	★	2	175	215	280	40.0	63	0.98	SOMX**166508-○○**	TPS54	TIP25D
NEW	4	MVX**5600X4F40**	★	2	231	271	336	40.0	63	0.98	SOMX**166508-○○**	TPS54	TIP25D
	4	MVX**5600X4F50**	★	2	231	271	346	50.0	63	0.98	SOMX**166508-○○**	TPS54	TIP25D
NEW	5	MVX**5600X5F40**	★	2	287	327	392	40.0	63	0.98	SOMX**166508-○○**	TPS54	TIP25D
	5	MVX**5600X5F50**	★	2	287	327	402	50.0	63	0.98	SOMX**166508-○○**	TPS54	TIP25D

★ Clamp Torque (lbf-in) : TIP25D=66

INSERTS ➤ L179
CUTTING CONDITIONS ➤ L180
TECHNICAL DATA ➤ N001

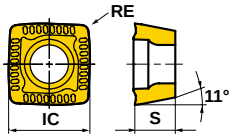
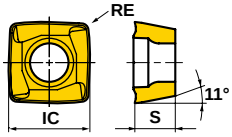
MVX

DC Metric (mm)	Hole Depth (l/d)	Holder Order Number	Stock	Number of Inserts	Dimensions LU (mm)	LPR (mm)	OAL (mm)	DCON (mm)	DCFSMS (mm)	A (mm)	Insert Order Number	* Clamp Screw	Wrench
57.0	2	MVX5700X2F40	★	2	121	161	226	40.0	68	1.47	SOMX187008-○○	TPS54	TIP25D
	3	MVX5700X3F40	★	2	178	218	283	40.0	68	1.47	SOMX187008-○○	TPS54	TIP25D
NEW	4	MVX5700X4F40	★	2	235	275	340	40.0	68	1.47	SOMX187008-○○	TPS54	TIP25D
	4	MVX5700X4F50	★	2	235	275	350	50.0	68	1.47	SOMX187008-○○	TPS54	TIP25D
NEW	5	MVX5700X5F40	★	2	292	332	397	40.0	68	1.47	SOMX187008-○○	TPS54	TIP25D
	5	MVX5700X5F50	★	2	292	332	407	50.0	68	1.47	SOMX187008-○○	TPS54	TIP25D
58.0	2	MVX5800X2F40	★	2	123	163	228	40.0	68	1.37	SOMX187008-○○	TPS54	TIP25D
	3	MVX5800X3F40	★	2	181	221	286	40.0	68	1.37	SOMX187008-○○	TPS54	TIP25D
NEW	4	MVX5800X4F40	★	2	239	279	344	40.0	68	1.37	SOMX187008-○○	TPS54	TIP25D
	4	MVX5800X4F50	★	2	239	279	354	50.0	68	1.37	SOMX187008-○○	TPS54	TIP25D
NEW	5	MVX5800X5F40	★	2	297	337	402	40.0	68	1.37	SOMX187008-○○	TPS54	TIP25D
	5	MVX5800X5F50	★	2	297	337	412	50.0	68	1.37	SOMX187008-○○	TPS54	TIP25D
59.0	2	MVX5900X2F40	★	2	125	165	230	40.0	68	1.26	SOMX187008-○○	TPS54	TIP25D
	3	MVX5900X3F40	★	2	184	224	289	40.0	68	1.26	SOMX187008-○○	TPS54	TIP25D
NEW	4	MVX5900X4F40	★	2	243	283	348	40.0	68	1.26	SOMX187008-○○	TPS54	TIP25D
	4	MVX5900X4F50	★	2	243	283	358	50.0	68	1.26	SOMX187008-○○	TPS54	TIP25D
NEW	5	MVX5900X5F40	★	2	302	342	407	40.0	68	1.26	SOMX187008-○○	TPS54	TIP25D
	5	MVX5900X5F50	★	2	302	342	417	50.0	68	1.26	SOMX187008-○○	TPS54	TIP25D
60.0	2	MVX6000X2F40	★	2	127	167	232	40.0	68	1.16	SOMX187008-○○	TPS54	TIP25D
	3	MVX6000X3F40	★	2	187	227	292	40.0	68	1.16	SOMX187008-○○	TPS54	TIP25D
NEW	4	MVX6000X4F40	★	2	247	287	352	40.0	68	1.16	SOMX187008-○○	TPS54	TIP25D
	4	MVX6000X4F50	★	2	247	287	362	50.0	68	1.16	SOMX187008-○○	TPS54	TIP25D
NEW	5	MVX6000X5F40	★	2	307	347	412	40.0	68	1.16	SOMX187008-○○	TPS54	TIP25D
	5	MVX6000X5F50	★	2	307	347	422	50.0	68	1.16	SOMX187008-○○	TPS54	TIP25D
61.0	2	MVX6100X2F40	★	2	129	169	234	40.0	68	1.05	SOMX187008-○○	TPS54	TIP25D
	3	MVX6100X3F40	★	2	190	230	295	40.0	68	1.05	SOMX187008-○○	TPS54	TIP25D
NEW	4	MVX6100X4F40	★	2	251	291	356	40.0	68	1.05	SOMX187008-○○	TPS54	TIP25D
	4	MVX6100X4F50	★	2	251	291	366	50.0	68	1.05	SOMX187008-○○	TPS54	TIP25D
NEW	5	MVX6100X5F40	★	2	312	352	417	40.0	68	1.05	SOMX187008-○○	TPS54	TIP25D
	5	MVX6100X5F50	★	2	312	352	427	50.0	68	1.05	SOMX187008-○○	TPS54	TIP25D
62.0	2	MVX6200X2F40	★	2	131	171	236	40.0	68	0.95	SOMX187008-○○	TPS54	TIP25D
	3	MVX6200X3F40	★	2	193	233	298	40.0	68	0.95	SOMX187008-○○	TPS54	TIP25D
NEW	4	MVX6200X4F40	★	2	255	295	360	40.0	68	0.95	SOMX187008-○○	TPS54	TIP25D
	4	MVX6200X4F50	★	2	255	295	370	50.0	68	0.95	SOMX187008-○○	TPS54	TIP25D
NEW	5	MVX6200X5F40	★	2	317	357	422	40.0	68	0.95	SOMX187008-○○	TPS54	TIP25D
	5	MVX6200X5F50	★	2	317	357	432	50.0	68	0.95	SOMX187008-○○	TPS54	TIP25D
63.0	2	MVX6300X2F40	★	2	133	173	238	40.0	68	0.85	SOMX187008-○○	TPS54	TIP25D
	3	MVX6300X3F40	★	2	196	236	301	40.0	68	0.85	SOMX187008-○○	TPS54	TIP25D
NEW	4	MVX6300X4F40	★	2	259	299	364	40.0	68	0.85	SOMX187008-○○	TPS54	TIP25D
	4	MVX6300X4F50	★	2	259	299	374	50.0	68	0.85	SOMX187008-○○	TPS54	TIP25D
NEW	5	MVX6300X5F40	★	2	322	362	427	40.0	68	0.85	SOMX187008-○○	TPS54	TIP25D
	5	MVX6300X5F50	★	2	322	362	437	50.0	68	0.85	SOMX187008-○○	TPS54	TIP25D

* Clamp Torque (lbf-in) : TIP25D=66

★ : Inventory maintained in Japan.

INSERTS

Shape	DC (mm)	Order Number	Dimensions (mm)			Stock			Geometry
			IC	S	RE	VP15TF	MC1020	MC5020	
UM	ø17—ø19.5	**SOMX063005-UM**	6	3	0.5	●	●	●	
	ø20—ø22.5	SOMX**073505-UM**	7	3.5	0.5	●	●	●	
	ø23—ø27.5	SOMX**084005-UM**	8.3	4	0.5	●	●	●	
	ø28—ø33	SOMX**094506-UM**	9.7	4.5	0.6	●	●	●	
	ø33.5—ø39	SOMX**115506-UM**	11.6	5.5	0.6	●	●	●	
	ø40—ø46	SOMX**136008-UM**	13.8	6	0.8	●	●	●	
	ø47—ø56	SOMX**166508-UM**	16.5	6.5	0.8	●	●	●	
General purpose	ø57—ø63	SOMX**187008-UM**	18.2	7	0.8	●	●	●	
US	ø17—ø19.5	**SOMX063005-US**	6	3	0.5	●	–	–	
	ø20—ø22.5	SOMX**073505-US**	7	3.5	0.5	●	–	–	
	ø23—ø27.5	SOMX**084005-US**	8.3	4	0.5	●	–	–	
 For stainless steel and inner edge	ø28—ø33	SOMX**094506-US**	9.7	4.5	0.6	●	–	–	

∗MC1020 and MC5020 are made exclusively for use as an outer insert.

CUTTING CONDITIONS ➤ L180
TECHNICAL DATA ➤ N001

MVX

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	DC		ϕ.687"—ϕ.750" ϕ17—ϕ19.5mm				ϕ.812"—ϕ.937" ϕ20—ϕ23.5mm			
			Recommended Grade		Cutting Speed (SFM)	Feed Rate (IPR)			Cutting Speed (SFM)	Feed Rate (IPR)		
			Outer	Inner	l/d=2—6	l/d=2, 3	l/d=4, 5	l/d=6	l/d=2—6	l/d=2, 3	l/d=4, 5	l/d=6
P	Mild Steel	≤180HB	MC1020	VP15TF	655 (590—770)	.0020 (.0016—.0024)	.0020 (.0016—.0024)	.0016 (.0016—.0020)	655 (590—770)	.0024 (.0016—.0031)	.0024 (.0016—.0028)	.0016 (.0016—.0020)
P	Carbon Steel Alloy Steel	180—280HB	MC1020	VP15TF	460 (375—590)	.0031 (.0024—.0055)	.0031 (.0024—.0035)	.0020 (.0016—.0024)	460 (375—590)	.0039 (.0024—.0071)	.0035 (.0024—.0047)	.0028 (.0024—.0031)
P		280—350HB	MC1020	VP15TF	330 (245—460)	.0031 (.0024—.0055)	.0031 (.0024—.0035)	.0020 (.0016—.0024)	330 (245—460)	.0039 (.0024—.0071)	.0035 (.0024—.0047)	.0028 (.0024—.0031)
P	Alloy tool steel	≤350HB	MC1020	VP15TF	440 (330—560)	.0031 (.0024—.0055)	.0031 (.0024—.0035)	.0020 (.0016—.0024)	440 (330—560)	.0039 (.0024—.0071)	.0035 (.0024—.0047)	.0028 (.0024—.0031)
M	Austenitic Stainless Steel	≤200HB	MC1020	VP15TF	425 (260—590)	.0031 (.0024—.0047)	.0024 (.0016—.0031)	.0020 (.0016—.0020)	425 (260—590)	.0039 (.0024—.0055)	.0028 (.0024—.0031)	.0024 (.0024—.0028)
M		>200HB	MC1020	VP15TF	425 (260—590)	.0031 (.0024—.0047)	.0024 (.0016—.0031)	.0020 (.0016—.0020)	425 (260—590)	.0039 (.0024—.0055)	.0028 (.0024—.0031)	.0024 (.0024—.0028)
M	Ferritic, Martensitic Stainless Steel	≤200HB	MC1020	VP15TF	390 (260—540)	.0031 (.0024—.0047)	.0024 (.0016—.0031)	.0020 (.0016—.0020)	390 (260—540)	.0039 (.0024—.0055)	.0028 (.0024—.0031)	.0024 (.0024—.0028)
M		>200HB	MC1020	VP15TF	390 (260—540)	.0031 (.0024—.0047)	.0024 (.0016—.0031)	.0020 (.0016—.0020)	390 (260—540)	.0039 (.0024—.0055)	.0028 (.0024—.0031)	.0024 (.0024—.0028)
K	Gray Cast Iron	Tensile Strength ≤350MPa	MC5020	VP15TF	525 (425—640)	.0043 (.0031—.0055)	.0035 (.0031—.0039)	.0020 (.0016—.0024)	525 (425—640)	.0055 (.0039—.0071)	.0039 (.0039—.0047)	.0028 (.0024—.0031)
K	Ductile Cast Iron	Tensile Strength ≤450MPa	MC5020	VP15TF	330 (260—440)	.0043 (.0031—.0055)	.0035 (.0031—.0039)	.0020 (.0016—.0024)	330 (260—440)	.0051 (.0039—.0047)	.0039 (.0039—.0043)	.0028 (.0024—.0031)
K		Tensile Strength ≤800MPa	MC5020	VP15TF	330 (230—410)	.0043 (.0031—.0055)	.0035 (.0031—.0039)	.0020 (.0016—.0024)	330 (230—410)	.0051 (.0039—.0047)	.0039 (.0039—.0043)	.0028 (.0024—.0031)

	Work Material	Hardness	DC		ϕ1.000"—ϕ1.125" ϕ24—ϕ29.5mm				ϕ1.187"—ϕ1.250" ϕ30—ϕ33mm			
			Recommended Grade		Cutting Speed (SFM)	Feed Rate (IPR)			Cutting Speed (SFM)	Feed Rate (IPR)		
			Outer	Inner	l/d=2—6	l/d=2, 3	l/d=4, 5	l/d=6	l/d=2—6	l/d=2, 3	l/d=4, 5	l/d=6
P	Mild Steel	≤180HB	MC1020	VP15TF	655 (590—770)	.0028 (.0016—.0031)	.0024 (.0016—.0028)	.0020 (.0016—.0024)	655 (590—770)	.0031 (.0024—.0039)	.0028 (.0024—.0031)	.0024 (.0024—.0028)
P	Carbon Steel Alloy Steel	180—280HB	MC1020	VP15TF	460 (375—590)	.0047 (.0031—.0071)	.0039 (.0031—.0047)	.0035 (.0031—.0039)	460 (375—590)	.0055 (.0031—.0094)	.0047 (.0031—.0063)	.0043 (.0039—.0047)
P		280—350HB	MC1020	VP15TF	330 (245—460)	.0047 (.0031—.0071)	.0039 (.0031—.0047)	.0035 (.0031—.0039)	330 (245—460)	.0055 (.0031—.0094)	.0047 (.0031—.0063)	.0043 (.0039—.0047)
P	Alloy tool steel	≤350HB	MC1020	VP15TF	440 (330—560)	.0047 (.0031—.0071)	.0039 (.0031—.0047)	.0035 (.0031—.0039)	440 (330—560)	.0055 (.0031—.0094)	.0047 (.0031—.0063)	.0039 (.0031—.0047)
M	Austenitic Stainless Steel	≤200HB	MC1020	VP15TF	425 (260—590)	.0039 (.0024—.0055)	.0031 (.0024—.0039)	.0028 (.0024—.0031)	425 (260—590)	.0039 (.0024—.0055)	.0035 (.0024—.0047)	.0028 (.0024—.0039)
M		>200HB	MC1020	VP15TF	425 (260—590)	.0039 (.0024—.0055)	.0031 (.0024—.0039)	.0028 (.0024—.0031)	425 (260—590)	.0039 (.0024—.0055)	.0035 (.0024—.0047)	.0028 (.0024—.0039)
M	Ferritic, Martensitic Stainless Steel	≤200HB	MC1020	VP15TF	390 (260—540)	.0039 (.0024—.0055)	.0031 (.0024—.0039)	.0028 (.0024—.0031)	390 (260—540)	.0039 (.0024—.0055)	.0035 (.0024—.0047)	.0028 (.0024—.0039)
M		>200HB	MC1020	VP15TF	390 (260—540)	.0039 (.0024—.0055)	.0031 (.0024—.0039)	.0028 (.0024—.0031)	390 (260—540)	.0039 (.0024—.0055)	.0035 (.0024—.0047)	.0028 (.0024—.0039)
K	Gray Cast Iron	Tensile Strength ≤350MPa	MC5020	VP15TF	525 (425—640)	.0059 (.0039—.0079)	.0043 (.0039—.0051)	.0035 (.0031—.0039)	525 (425—640)	.0059 (.0039—.0079)	.0047 (.0039—.0051)	.0043 (.0039—.0047)
K	Ductile Cast Iron	Tensile Strength ≤450MPa	MC5020	VP15TF	330 (260—440)	.0055 (.0039—.0071)	.0043 (.0039—.0047)	.0035 (.0031—.0039)	330 (260—440)	.0059 (.0039—.0079)	.0047 (.0039—.0051)	.0043 (.0039—.0047)
K		Tensile Strength ≤800MPa	MC5020	VP15TF	330 (230—410)	.0055 (.0039—.0071)	.0043 (.0039—.0047)	.0035 (.0031—.0039)	330 (230—410)	.0059 (.0039—.0079)	.0047 (.0039—.0051)	.0043 (.0039—.0047)

1) Reduce the cutting speed by around 30% when using VP15TF for outer insert.
2) Recommend maximum drilling depth L/D≤3 for using outer coolant system.
3) Spindle through & high pressure coolant system is recommended to make stable holes for stainless steel.

	Work Material	Hardness	DC		ϕ1.312"—ϕ2.500" ϕ33.3—ϕ63.5mm			
			Recommended Grade		Cutting Speed (SFM)	Feed Rate (IPR)		
			Outer	Inner	l/d=2—6	l/d=2, 3	l/d=4, 5	l/d=6
P	Mild Steel	≤180HB	**MC1020**	**VP15TF**	655 (590-770)	.0031 (.0024-.0039)	.0028 (.0024-.0031)	.0024 (.0024-.0028)
	Carbon Steel Alloy Steel	180—280HB	**MC1020**	**VP15TF**	460 (375-590)	.0055 (.0031-.0094)	.0047 (.0031-.0063)	.0043 (.0039-.0047)
		280—350HB	**MC1020**	**VP15TF**	330 (245-460)	.0055 (.0031-.0094)	.0047 (.0031-.0063)	.0043 (.0039-.0047)
	Alloy tool steel	≤350HB	**MC1020**	**VP15TF**	440 (330-555)	.0055 (.0031-.0094)	.0047 (.0031-.0063)	.0039 (.0031-.0047)
M	Austenitic Stainless Steel	≤200HB	**MC1020**	**VP15TF**	425 (260-590)	.0035 (.0024-.0047)	.0031 (.0024-.0039)	.0028 (.0024-.0031)
		>200HB	**MC1020**	**VP15TF**	425 (260-590)	.0035 (.0024-.0047)	.0031 (.0024-.0039)	.0028 (.0024-.0031)
	Ferritic, Martensitic Stainless Steel	≤200HB	**MC1020**	**VP15TF**	390 (260-540)	.0035 (.0024-.0047)	.0031 (.0024-.0039)	.0028 (.0024-.0031)
		>200HB	**MC1020**	**VP15TF**	390 (260-540)	.0035 (.0024-.0047)	.0031 (.0024-.0039)	.0028 (.0024-.0031)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	**VP15TF**	525 (425-640)	.0059 (.0039-.0079)	.0047 (.0039-.0051)	.0043 (.0039-.0047)
	Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	**VP15TF**	330 (260-440)	.0059 (.0039-.0079)	.0047 (.0039-.0051)	.0043 (.0039-.0047)
		Tensile Strength ≤800MPa	**MC5020**	**VP15TF**	330 (230-410)	.0059 (.0039-.0079)	.0047 (.0039-.0051)	.0043 (.0039-.0047)

1) Reduce the cutting speed by around 30% when using VP15TF for outer insert.
2) Recommend maximum drilling depth L/D≤3 for using outer coolant system.
3) Spindle through & high pressure coolant system is recommended to make stable holes for stainless steel.

TAFM

- Highly rigid drill body.
- 4 corner insert.
- Various grades and chip breakers.

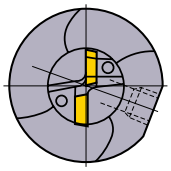
P M K N S H

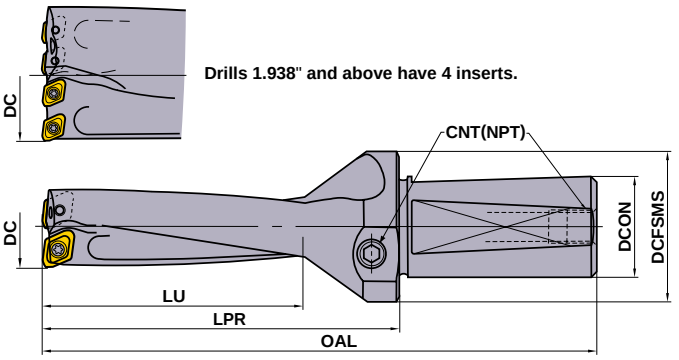
INCH STANDARD

L/D=3

Internal Coolant







Order Number	Stock	Dimensions (inch)							No. of Inserts	Insert No.	* Insert Screw	①② Wrench
		DC	LU	LPR	OAL	DCON	DCFSMS	CNT				
TAFM0468	▲	.468	1.60	2.47	4.22	.750	1.02	1/8	2	**GCMT040204-U○**	TS2	①TKY06F
TAFM**0500**	▲	.500	1.70	2.56	4.31	.750	1.02	1/8	2	GCMT**040204-U○**	TS2	①TKY06F
TAFM**0531**	▲	.531	1.79	2.66	4.41	.750	1.02	1/8	2	GCMT**040204-U○**	TS2	①TKY06F
TAFM**0562**	▲	.562	1.89	2.75	4.50	.750	1.02	1/8	2	GCMT**040204-U○**	TS2	①TKY06F
TAFM**0593**	▲	.593	1.98	2.84	4.59	.750	1.02	1/8	2	**GPMT 060204-U○**	TS2	①TKY06F
TAFM**0625**	▲	.625	2.13	3.31	6.31	1.000	1.73	1/4	2	GPMT **060204-U○**	TS2	①TKY06F
TAFM**0687**	▲	.687	2.34	3.49	6.49	1.000	1.73	1/4	2	GPMT **060204-U○**	TS2	①TKY06F
TAFM**0750**	▲	.750	2.55	3.68	6.68	1.000	1.73	1/4	2	GPMT **070204-U○**	TS25	①TKY08F
TAFM**0812**	▲	.812	2.76	3.87	6.87	1.000	1.73	1/4	2	GPMT **070204-U○**	TS25	①TKY08F
TAFM**0875**	▲	.875	2.98	4.06	7.06	1.000	1.73	1/4	2	GPMT **070204-U○**	TS25	①TKY08F
TAFM**0937**	▲	.937	3.19	4.24	7.24	1.000	1.73	1/4	2	GPMT **090304-U○**	TS3	①TKY08F
TAFM**1000**	▲	1.000	3.40	4.43	7.43	1.250	1.89	1/4	2	GPMT **090304-U○**	TS3	①TKY08F
TAFM**1062**	▲	1.062	3.61	4.62	7.62	1.250	1.89	1/4	2	GPMT **090304-U○**	TS3	①TKY08F
TAFM**1125**	▲	1.125	3.83	4.77	7.77	1.250	1.89	1/4	2	GPMT **11T308-U○**	TS4	②TKY15D
TAFM**1187**	▲	1.187	4.04	5.14	8.14	1.500	2.09	1/4	2	GPMT **11T308-U○**	TS4	②TKY15D
TAFM**1250**	▲	1.250	4.25	5.33	8.33	1.500	2.09	1/4	2	GPMT **11T308-U○**	TS4	②TKY15D
TAFM**1312**	▲	1.312	4.46	5.52	8.52	1.500	2.09	1/4	2	GPMT **11T308-U○**	TS4	②TKY15D
TAFM**1375**	▲	1.375	4.68	5.71	8.71	1.500	2.28	1/4	2	GPMT **140408-U○**	TS55	②TKY25D
TAFM**1437**	▲	1.437	4.89	5.89	8.89	1.500	2.28	1/4	2	GPMT **140408-U○**	TS55	②TKY25D
TAFM**1500**	▲	1.500	5.10	6.08	9.08	1.500	2.28	1/4	2	GPMT **140408-U○**	TS55	②TKY25D
TAFM**1562**	▲	1.562	5.31	6.27	9.27	1.500	2.28	1/4	2	GPMT **140408-U○**	TS55	②TKY25D
TAFM**1625**	▲	1.625	5.53	6.46	9.46	1.500	2.28	1/4	2	GPMT **140408-U○**	TS55	②TKY25D
TAFM**1687**	▲	1.687	5.74	6.65	9.65	1.500	2.28	1/4	2	GPMT **140408-U○**	TS55	②TKY25D
TAFM**1750**	▲	1.750	5.95	6.83	9.83	1.500	2.28	1/4	2	GPMT **140408-U○**	TS55	②TKY25D
TAFM**1812**	▲	1.812	6.16	7.02	10.02	1.500	2.48	1/4	2	GPMT **140408-U○**	TS55	②TKY25D
TAFM**1875**	▲	1.875	6.37	7.21	10.21	1.500	2.48	1/4	2	GPMT **140408-U○**	TS55	②TKY25D
TAFM**1937**	▲	1.937	6.59	7.43	10.43	1.500	2.48	1/4	4	GPMT **090304-U○**	TS3	①TKY08F
TAFM**2000**	▲	2.000	6.80	7.61	10.61	1.500	2.48	1/4	4	GPMT **090304-U○**	TS3	①TKY08F
TAFM**2062**	▲	2.062	7.01	7.81	10.81	1.500	2.48	1/4	4	GPMT **090304-U○**	TS3	①TKY08F
TAFM**2125**	▲	2.125	7.22	7.99	10.99	1.500	2.48	1/4	4	GPMT **090304-U○**	TS3	①TKY08F
TAFM**2187**	▲	2.187	7.44	8.19	11.19	1.500	2.48	1/4	4	GPMT **090304-U○**	TS3	①TKY08F
TAFM**2250**	▲	2.250	7.65	8.39	11.39	1.500	2.48	1/4	4	GPMT **11T308-U○**	TS4	②TKY15D

* Clamp Torque (lbf-in) : TS2=5.3, TS25=8.9, TS3=8.9, TS4=31, TS55=66

(Note) Please contact Mitsubishi Materials for special grades and geometries other than our standard products.

▲ : This item to be discontinued within two years.

TAFS

- Highly rigid drill body.
- 4 corner insert.
- Various grades and chip breakers.

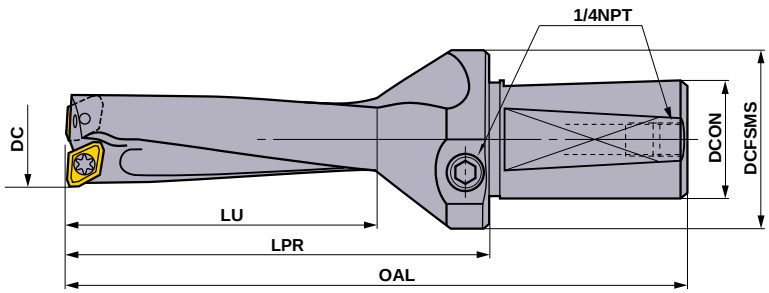
P M K N S H

INCH STANDARD

L/D=2

Internal Coolant





Order Number	Stock	Dimensions (inch)						No. of Inserts	Insert No.	* Insert Screw	①② Wrench
		DC	LU	LPR	OAL	DCON	DCFSMS				
TAFS0625	▲	.625	1.51	2.69	5.69	1.000	1.73	2	**GPMT060204-U○**	TS2	①TKY06F
TAFS0750	▲	.750	1.80	2.93	5.93	1.000	1.73	2	**GPMT070204-U○**	TS25	①TKY08F
TAFS0875	▲	.875	2.11	3.19	6.19	1.000	1.73	2	**GPMT070204-U○**	TS25	①TKY08F
TAFS1000	▲	1.000	2.40	3.43	6.43	1.250	1.89	2	**GPMT090304-U○**	TS3	①TKY08F
TAFS1125	▲	1.125	2.71	3.65	6.65	1.250	1.89	2	**GPMT11T308-U○**	TS4	②TKY15D
TAFS1250	▲	1.250	3.00	4.08	7.08	1.500	2.09	2	**GPMT11T308-U○**	TS4	②TKY15D

* Clamp Torque (lbf-in) : TS2=5.3, TS25=8.9, TS3=8.9, TS4=31

(Note) Please contact Mitsubishi Materials for special grades and geometries other than our standard products.

DRILLING

INSERTS ➤ L189
CUTTING CONDITIONS ➤ L190
TECHNICAL DATA ➤ N001

TAFL

- Highly rigid drill body.
- 4 corner insert.
- Various grades and chip breakers.

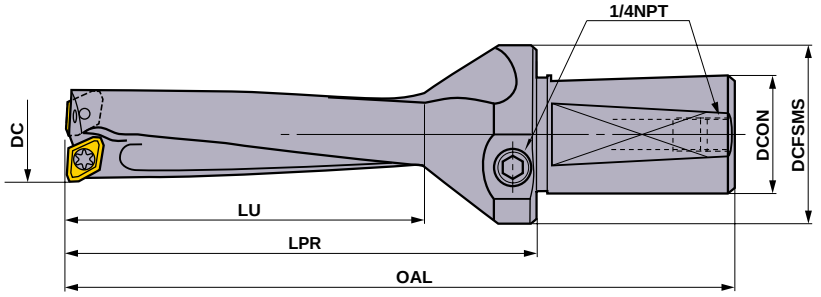
P M K N S H

INCH STANDARD

L/D=4

Internal Coolant





Order Number	Stock	Dimensions (inch)						No. of Inserts	Insert No.	* Insert Screw	①② Wrench
		DC	LU	LPR	OAL	DCON	DCFSMS				
TAFL0625	▲	.625	2.76	3.94	6.94	1.000	1.73	2	**GPMT060204-U○**	TS2	①TKY06F
TAFL0750	▲	.750	3.30	4.43	7.43	1.000	1.73	2	**GPMT070204-U○**	TS25	①TKY08F
TAFL0875	▲	.875	3.86	4.94	7.94	1.000	1.73	2	**GPMT070204-U○**	TS25	①TKY08F
TAFL1000	▲	1.000	4.40	5.43	8.43	1.250	1.89	2	**GPMT090304-U○**	TS3	①TKY08F
TAFL1125	▲	1.125	4.96	5.90	8.90	1.250	1.89	2	**GPMT11T308-U○**	TS4	②TKY15D
TAFL1250	▲	1.250	5.50	6.58	9.58	1.500	2.09	2	**GPMT11T308-U○**	TS4	②TKY15D

* Clamp Torque (lbf-in) : TS2=5.3, TS25=8.9, TS3=8.9, TS4=31

(Note) Please contact Mitsubishi Materials for special grades and geometries other than our standard products.

▲ : This item to be discontinued within two years.

TAFS/TAFM/TAFL

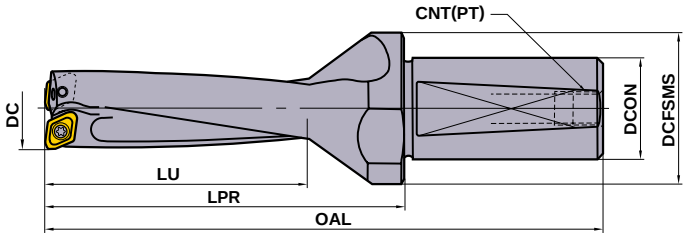
- Highly rigid drill body.
- 4 corner insert.
- Various grades and chip breakers.

P M K N S H

METRIC STANDARD

Internal Coolant





Side Coolant Not Available.

DC (mm)	Hole Depth (l/d)	Order Number	Stock	Dimensions (mm) LU	LPR	OAL	DCON	DCFSMS	CNT	No. of Insert	Insert No.	* Insert Screw	Wrench
12.0	2	TAFS1200F20	▲	29	39	82	20	25	1/8	2	GCMT040204-U○	TS2	TKY06F
	3	TAFM1200F20	▲	41	51	94	20	25	1/8	2	GCMT040204-U○	TS2	TKY06F
12.5	2	TAFS1250F20	▲	29	39	82	20	25	1/8	2	GCMT040204-U○	TS2	TKY06F
	3	TAFM1250F20	▲	41	51	94	20	25	1/8	2	GCMT040204-U○	TS2	TKY06F
13.0	2	TAFS1300F20	▲	31	41	84	20	25	1/8	2	GCMT040204-U○	TS2	TKY06F
	3	TAFM1300F20	▲	44	54	97	20	25	1/8	2	GCMT040204-U○	TS2	TKY06F
13.5	2	TAFS1350F20	▲	31	41	84	20	25	1/8	2	GCMT040204-U○	TS2	TKY06F
	3	TAFM1350F20	▲	44	54	97	20	25	1/8	2	GCMT040204-U○	TS2	TKY06F
14.0	2	TAFS1400F20	▲	33	43	86	20	25	1/8	2	GCMT040204-U○	TS2	TKY06F
	3	TAFM1400F20	▲	47	57	100	20	25	1/8	2	GCMT040204-U○	TS2	TKY06F
14.5	2	TAFS1450F20	▲	33	43	86	20	25	1/8	2	GCMT040204-U○	TS2	TKY06F
	3	TAFM1450F20	▲	47	57	100	20	25	1/8	2	GCMT040204-U○	TS2	TKY06F
15.0	2	TAFS1500F20	▲	35	45	88	20	25	1/8	2	GPMT060204-U○	TS2	TKY06F
	3	TAFM1500F20	▲	50	60	103	20	25	1/8	2	GPMT060204-U○	TS2	TKY06F
15.5	2	TAFS1550F20	▲	35	45	88	20	25	1/8	2	GPMT060204-U○	TS2	TKY06F
	3	TAFM1550F20	▲	50	60	103	20	25	1/8	2	GPMT060204-U○	TS2	TKY06F
16.0	2	TAFS1600F25	▲	38	57	107	25	35	1/8	2	GPMT060204-U○	TS2	TKY06F
	3	TAFM1600F25	▲	54	73	123	25	35	1/8	2	GPMT060204-U○	TS2	TKY06F
	4	TAFL1600F25	▲	70	89	139	25	35	1/8	2	GPMT060204-U○	TS2	TKY06F
16.5	2	TAFS1650F25	▲	38	57	107	25	35	1/8	2	GPMT060204-U○	TS2	TKY06F
	3	TAFM1650F25	▲	54	73	123	25	35	1/8	2	GPMT060204-U○	TS2	TKY06F
17.0	2	TAFS1700F25	▲	41	59	109	25	35	1/8	2	GPMT060204-U○	TS2	TKY06F
	3	TAFM1700F25	▲	58	76	126	25	35	1/8	2	GPMT060204-U○	TS2	TKY06F
	4	TAFL1700F25	▲	75	93	143	25	35	1/8	2	GPMT060204-U○	TS2	TKY06F
17.5	2	TAFS1750F25	▲	41	59	109	25	35	1/8	2	GPMT060204-U○	TS2	TKY06F
	3	TAFM1750F25	▲	58	76	126	25	35	1/8	2	GPMT060204-U○	TS2	TKY06F
18.0	2	TAFS1800F25	▲	43	61	111	25	35	1/8	2	GPMT070204-U○	TS25	TKY08F
	3	TAFM1800F25	▲	61	79	129	25	35	1/8	2	GPMT070204-U○	TS25	TKY08F
	4	TAFL1800F25	▲	79	97	147	25	35	1/8	2	GPMT070204-U○	TS25	TKY08F
18.5	2	TAFS1850F25	▲	43	61	111	25	35	1/8	2	GPMT070204-U○	TS25	TKY08F
	3	TAFM1850F25	▲	61	79	129	25	35	1/8	2	GPMT070204-U○	TS25	TKY08F
19.0	2	TAFS1900F25	▲	46	63	113	25	35	1/8	2	GPMT070204-U○	TS25	TKY08F
	3	TAFM1900F25	▲	65	82	132	25	35	1/8	2	GPMT070204-U○	TS25	TKY08F
	4	TAFL1900F25	▲	84	101	151	25	35	1/8	2	GPMT070204-U○	TS25	TKY08F

* Clamp Torque (lbf-in) : TS2=5.3, TS25=8.9

(Note) Please contact Mitsubishi Materials for special grades and geometries other than our standard products.

INSERTS ➤ L189
CUTTING CONDITIONS ➤ L190
TECHNICAL DATA ➤ N001

TAFS/TAFM/TAFL

Side Coolant Not Available.

DC (mm)	Hole Depth (l/d)	Order Number	Stock	Dimensions (mm)						No. of Insert	Insert No.	* Insert Screw	①② Wrench
				LU	LPR	OAL	DCON	DCFSMS	CNT				
19.5	2	TAFS1950F25	▲	46	63	113	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
	3	TAFM1950F25	▲	65	82	132	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
20.0	2	TAFS2000F25	▲	48	65	115	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
	3	TAFM2000F25	▲	68	85	135	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
	4	TAFL2000F25	▲	88	105	155	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
20.5	2	TAFS2050F25	▲	48	65	115	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
	3	TAFM2050F25	▲	68	85	135	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
21.0	2	TAFS2100F25	▲	50	67	117	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
	3	TAFM2100F25	▲	71	88	138	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
	4	TAFL2100F25	▲	92	109	159	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
21.5	2	TAFS2150F25	▲	50	67	117	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
	3	TAFM2150F25	▲	71	88	138	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
22.0	2	TAFS2200F25	▲	53	69	119	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
	3	TAFM2200F25	▲	75	91	141	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
	4	TAFL2200F25	▲	97	113	163	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
22.5	2	TAFS2250F25	▲	53	69	119	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
	3	TAFM2250F25	▲	75	91	141	25	35	1/8	2	GPMT070204-U○	TS25	①TKY08F
23.0	2	TAFS2300F25	▲	55	71	121	25	35	1/8	2	GPMT090304-U○	TS3	①TKY08F
	3	TAFM2300F25	▲	78	94	144	25	35	1/8	2	GPMT090304-U○	TS3	①TKY08F
	4	TAFL2300F25	▲	101	117	167	25	35	1/8	2	GPMT090304-U○	TS3	①TKY08F
23.5	2	TAFS2350F25	▲	55	71	121	25	35	1/8	2	GPMT090304-U○	TS3	①TKY08F
	3	TAFM2350F25	▲	78	94	144	25	35	1/8	2	GPMT090304-U○	TS3	①TKY08F
24.0	2	TAFS2400F25	▲	58	73	123	25	35	1/8	2	GPMT090304-U○	TS3	①TKY08F
	3	TAFM2400F25	▲	82	97	147	25	35	1/8	2	GPMT090304-U○	TS3	①TKY08F
	4	TAFL2400F25	▲	106	121	171	25	35	1/8	2	GPMT090304-U○	TS3	①TKY08F
24.5	2	TAFS2450F25	▲	58	73	123	25	35	1/8	2	GPMT090304-U○	TS3	①TKY08F
	3	TAFM2450F25	▲	82	97	147	25	35	1/8	2	GPMT090304-U○	TS3	①TKY08F
25.0	2	TAFS2500F32	▲	60	75	130	32	42	1/8	2	GPMT090304-U○	TS3	①TKY08F
	3	TAFM2500F32	▲	85	100	155	32	42	1/8	2	GPMT090304-U○	TS3	①TKY08F
	4	TAFL2500F32	▲	110	125	180	32	42	1/8	2	GPMT090304-U○	TS3	①TKY08F
25.5	2	TAFS2550F32	▲	60	75	130	32	42	1/8	2	GPMT090304-U○	TS3	①TKY08F
	3	TAFM2550F32	▲	85	100	155	32	42	1/8	2	GPMT090304-U○	TS3	①TKY08F
26.0	2	TAFS2600F32	▲	62	77	132	32	42	1/8	2	GPMT090304-U○	TS3	①TKY08F
	3	TAFM2600F32	▲	88	103	158	32	42	1/8	2	GPMT090304-U○	TS3	①TKY08F
	4	TAFL2600F32	▲	114	129	184	32	42	1/8	2	GPMT090304-U○	TS3	①TKY08F
26.5	2	TAFS2650F32	▲	62	77	132	32	42	1/8	2	GPMT090304-U○	TS3	①TKY08F
	3	TAFM2650F32	▲	88	103	158	32	42	1/8	2	GPMT090304-U○	TS3	①TKY08F
27.0	2	TAFS2700F32	▲	65	79	134	32	42	1/8	2	GPMT090304-U○	TS3	①TKY08F
	3	TAFM2700F32	▲	92	106	161	32	42	1/8	2	GPMT090304-U○	TS3	①TKY08F
	4	TAFL2700F32	▲	119	133	188	32	42	1/8	2	GPMT090304-U○	TS3	①TKY08F
27.5	2	TAFS2750F32	▲	65	79	134	32	42	1/8	2	GPMT090304-U○	TS3	①TKY08F
	3	TAFM2750F32	▲	92	106	161	32	42	1/8	2	GPMT090304-U○	TS3	①TKY08F
28.0	2	TAFS2800F32	▲	67	81	136	32	42	1/8	2	GPMT11T308-U○	TS4	②TKY15D
	3	TAFM2800F32	▲	95	109	164	32	42	1/8	2	GPMT11T308-U○	TS4	②TKY15D
	4	TAFL2800F32	▲	123	137	192	32	42	1/8	2	GPMT11T308-U○	TS4	②TKY15D
28.5	2	TAFS2850F32	▲	67	81	136	32	42	1/8	2	GPMT11T308-U○	TS4	②TKY15D
	3	TAFM2850F32	▲	95	109	164	32	42	1/8	2	GPMT11T308-U○	TS4	②TKY15D

* Clamp Torque (lbf-in) : TS25=8.9, TS3=8.9, TS4=31

(Note) Please contact Mitsubishi Materials for special grades and geometries other than our standard products.

▲ : This item to be discontinued within two years.

Side Coolant Not Available.

DC (mm)	Hole Depth (l/d)	Order Number	Stock	Dimensions (mm)						No. of Insert	Insert No.	* Insert Screw	Wrench
				LU	LPR	OAL	DCON	DCFSMS	CNT				
29.0	2	TAFS2900F32	▲	70	83	138	32	42	1/8	2	GPMT11T308-U○	TS4	TKY15D
	3	TAFM2900F32	▲	99	112	167	32	42	1/8	2	GPMT11T308-U○	TS4	TKY15D
	4	TAFL2900F32	▲	128	141	196	32	42	1/8	2	GPMT11T308-U○	TS4	TKY15D
29.5	2	TAFS2950F32	▲	70	83	138	32	42	1/8	2	GPMT11T308-U○	TS4	TKY15D
	3	TAFM2950F32	▲	99	112	167	32	42	1/8	2	GPMT11T308-U○	TS4	TKY15D
30.0	2	TAFS3000F40	▲	72	90	155	40	50	1/4	2	GPMT11T308-U○	TS4	TKY15D
	3	TAFM3000F40	▲	102	120	185	40	50	1/4	2	GPMT11T308-U○	TS4	TKY15D
	4	TAFL3000F40	▲	132	150	215	40	50	1/4	2	GPMT11T308-U○	TS4	TKY15D
31.0	2	TAFS3100F40	▲	74	92	157	40	50	1/4	2	GPMT11T308-U○	TS4	TKY15D
	3	TAFM3100F40	▲	105	123	188	40	50	1/4	2	GPMT11T308-U○	TS4	TKY15D
	4	TAFL3100F40	▲	136	154	219	40	50	1/4	2	GPMT11T308-U○	TS4	TKY15D
32.0	2	TAFS3200F40	▲	77	94	159	40	50	1/4	2	GPMT11T308-U○	TS4	TKY15D
	3	TAFM3200F40	▲	109	126	191	40	50	1/4	2	GPMT11T308-U○	TS4	TKY15D
	4	TAFL3200F40	▲	141	158	223	40	50	1/4	2	GPMT11T308-U○	TS4	TKY15D
33.0	2	TAFS3300F40	▲	79	96	161	40	50	1/4	2	GPMT11T308-U○	TS4	TKY15D
	3	TAFM3300F40	▲	112	129	194	40	50	1/4	2	GPMT11T308-U○	TS4	TKY15D
	4	TAFL3300F40	▲	145	162	227	40	50	1/4	2	GPMT11T308-U○	TS4	TKY15D
34.0	2	TAFS3400F40	▲	82	98	163	40	50	1/4	2	GPMT11T308-U○	TS4	TKY15D
	3	TAFM3400F40	▲	116	132	197	40	50	1/4	2	GPMT11T308-U○	TS4	TKY15D
	4	TAFL3400F40	▲	150	166	231	40	50	1/4	2	GPMT11T308-U○	TS4	TKY15D
35.0	2	TAFS3500F40	▲	84	100	165	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
	3	TAFM3500F40	▲	119	135	200	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
36.0	2	TAFS3600F40	▲	86	102	167	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
	3	TAFM3600F40	▲	122	138	203	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
37.0	2	TAFS3700F40	▲	89	104	169	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
	3	TAFM3700F40	▲	126	141	206	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
38.0	2	TAFS3800F40	▲	91	106	171	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
	3	TAFM3800F40	▲	129	144	209	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
39.0	2	TAFS3900F40	▲	94	108	173	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
	3	TAFM3900F40	▲	133	147	212	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
40.0	2	TAFS4000F40	▲	96	110	175	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
	3	TAFM4000F40	▲	136	150	215	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
41.0	2	TAFS4100F40	▲	98	112	177	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
	3	TAFM4100F40	▲	139	153	218	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
42.0	2	TAFS4200F40	▲	101	114	179	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
	3	TAFM4200F40	▲	143	156	221	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
43.0	2	TAFS4300F40	▲	103	116	181	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
	3	TAFM4300F40	▲	146	159	224	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
44.0	2	TAFS4400F40	▲	106	118	183	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
	3	TAFM4400F40	▲	150	162	227	40	50	1/4	2	GPMT140408-U○	TS55	TKY25D
45.0	2	TAFS4500F40	▲	108	120	185	40	54	1/4	2	GPMT140408-U○	TS55	TKY25D
	3	TAFM4500F40	▲	153	165	230	40	54	1/4	2	GPMT140408-U○	TS55	TKY25D
46.0	2	TAFS4600F40	▲	110	122	187	40	54	1/4	2	GPMT140408-U○	TS55	TKY25D
	3	TAFM4600F40	▲	156	168	233	40	54	1/4	2	GPMT140408-U○	TS55	TKY25D
47.0	2	TAFS4700F40	▲	113	124	189	40	54	1/4	2	GPMT140408-U○	TS55	TKY25D
	3	TAFM4700F40	▲	160	171	236	40	54	1/4	2	GPMT140408-U○	TS55	TKY25D
48.0	2	TAFS4800F40	▲	115	126	191	40	54	1/4	2	GPMT140408-U○	TS55	TKY25D
	3	TAFM4800F40	▲	163	174	239	40	54	1/4	2	GPMT140408-U○	TS55	TKY25D

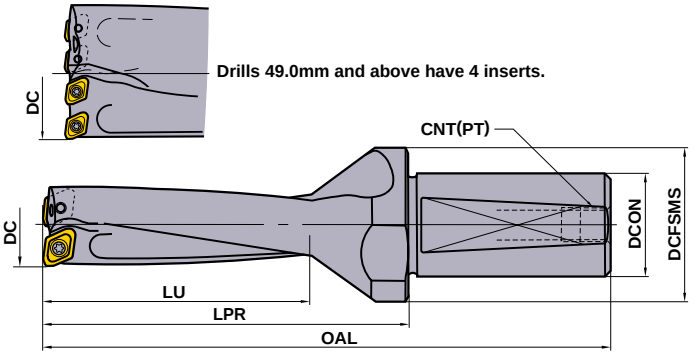
* Clamp Torque (lbf-in) : TS4=31, TS55=66

DRILLING

CUTTING CONDITIONS ➤ L190
INSERTS ➤ L189
TECHNICAL DATA ➤ N001

TAFS/TAFM/TAFL





Side Coolant Not Available.

DC (mm)	Hole Depth (l/d)	Order Number	Stock	Dimensions (mm) LU	LPR	OAL	DCON	DCFSMS	CNT	No. of Insert	Insert No.	* Insert Screw	Wrench
49.0	2	TAFS4900F40	▲	118	133	198	40	58	1/4	4	GPMT090304-U○	TS3	TKY08F
	3	TAFM4900F40	▲	167	182	247	40	58	1/4	4	GPMT090304-U○	TS3	TKY08F
50.0	2	TAFS5000F40	▲	120	135	200	40	58	1/4	4	GPMT090304-U○	TS3	TKY08F
	3	TAFM5000F40	▲	170	185	250	40	58	1/4	4	GPMT090304-U○	TS3	TKY08F
51.0	2	TAFS5100F40	▲	122	137	202	40	58	1/4	4	GPMT090304-U○	TS3	TKY08F
	3	TAFM5100F40	▲	173	188	253	40	58	1/4	4	GPMT090304-U○	TS3	TKY08F
52.0	2	TAFS5200F40	▲	125	139	204	40	58	1/4	4	GPMT090304-U○	TS3	TKY08F
	3	TAFM5200F40	▲	177	191	256	40	58	1/4	4	GPMT090304-U○	TS3	TKY08F
53.0	2	TAFS5300F40	▲	127	141	206	40	63	1/4	4	GPMT090304-U○	TS3	TKY08F
	3	TAFM5300F40	▲	180	194	259	40	63	1/4	4	GPMT090304-U○	TS3	TKY08F
54.0	2	TAFS5400F40	▲	128	143	208	40	63	1/4	4	GPMT090304-U○	TS3	TKY08F
	3	TAFM5400F40	▲	182	197	262	40	63	1/4	4	GPMT090304-U○	TS3	TKY08F
55.0	2	TAFS5500F40	▲	130	145	210	40	63	1/4	4	GPMT090304-U○	TS3	TKY08F
	3	TAFM5500F40	▲	185	200	265	40	63	1/4	4	GPMT090304-U○	TS3	TKY08F
56.0	2	TAFS5600F40	▲	132	147	212	40	63	1/4	4	GPMT090304-U○	TS3	TKY08F
	3	TAFM5600F40	▲	188	203	268	40	63	1/4	4	GPMT090304-U○	TS3	TKY08F

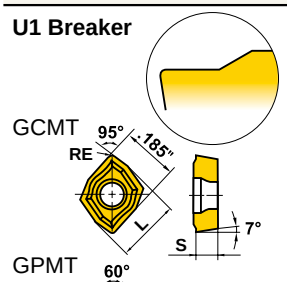
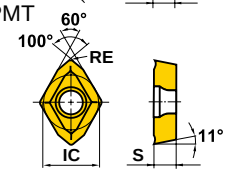
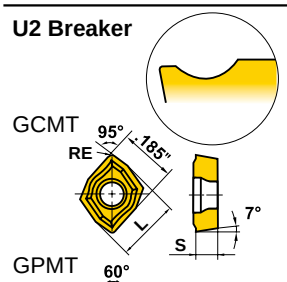
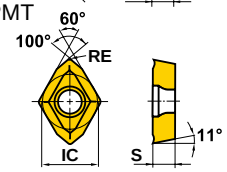
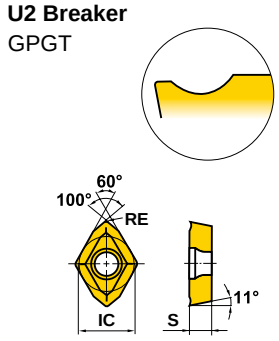
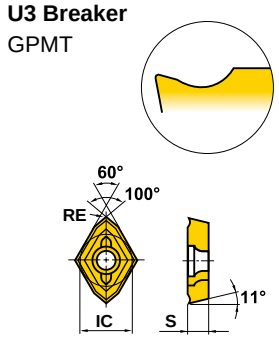
* Clamp Torque (lbf-in) : TS3=8.9

(Note) Please contact Mitsubishi Materials for special grades and geometries other than our standard products.

▲ : This item to be discontinued within two years.

TAF TYPE DRILL

INSERTS

Shape	Class	Drill Diameter (inch) (mm)	Order Number	Coated					Carbide	Dimensions (inch)			
				UE6020	GP20M	UP20M	US735	VP15TF	TF15	IC	L	S	RE
U1 Breaker GCMT  GPMT 	M	.469—.563inch 12.0—14.5mm	**GCMT040204-U1**			▲				—	.196	.094	.016
		.594—.688inch 15.0—17.5mm	**GPMT060204-U1**	▲		▲				.219	—	.094	.016
		.750—.875inch 18.0—22.5mm	GPMT**070204-U1**	▲		▲				.250	—	.094	.016
		.938—1.063inch ★1.938—2.188inch 23.0—27.5mm ★49.0—56.0mm	GPMT**090304-U1**	▲		▲				.313	—	.125	.016
		1.125—1.313inch ★2.250inch 28.0—34.0mm	GPMT**11T308-U1**	▲		▲				.375	—	.156	.031
		1.375—1.875inch 35.0—48.0mm	GPMT**140408-U1**	▲		▲				.500	—	.188	.031
U2 Breaker GCMT  GPMT 	M	.469—.563inch 12.0—14.5mm	**GCMT040204-U2**		▲	▲		▲		—	.196	.094	.016
		.594—.688inch 15.0—17.5mm	**GPMT060204-U2**	▲		▲	▲	▲		.219	—	.094	.016
		.750—.875inch 18.0—22.5mm	GPMT**070204-U2**	▲		▲	▲	▲		.250	—	.094	.016
		.938—1.063inch ★1.938—2.188inch 23.0—27.5mm ★49.0—56.0mm	GPMT**090304-U2**	▲		▲	▲	▲		.313	—	.125	.016
		1.125—1.313inch ★2.250inch 28.0—34.0mm	GPMT**11T308-U2**	▲		▲	▲	▲		.375	—	.156	.031
		1.375—1.875inch 35.0—48.0mm	GPMT**140408-U2**	▲		▲	▲	▲		.500	—	.188	.031
U2 Breaker GPGT 	G	.594—.688inch 15.0—17.5mm	**GPGT060204-U2**						▲	.219	—	.094	.016
		.750—.875inch 18.0—22.5mm	GPGT**070204-U2**						▲	.250	—	.094	.016
		.938—1.063inch ★1.938—2.188inch 23.0—27.5mm ★49.0—56.0mm	GPGT**090304-U2**						▲	.313	—	.125	.016
		1.125—1.313inch ★2.250inch 28.0—34.0mm	GPGT**11T308-U2**						▲	.375	—	.156	.031
		1.375—1.875inch 35.0—48.0mm	GPGT**140408-U2**						▲	.500	—	.188	.031
U3 Breaker GPMT 	M	.594—.688inch 15.0—17.5mm	**GPMT060204-U3**	▲		▲	▲			.219	—	.094	.016
		.750—.875inch 18.0—22.5mm	GPMT**070204-U3**	▲		▲	▲			.250	—	.094	.016
		.938—1.063inch ★1.938—2.188inch 23.0—27.5mm ★49.0—56.0mm	GPMT**090304-U3**	▲		▲	▲			.313	—	.125	.016
		1.125—1.313inch ★2.250inch 28.0—34.0mm	GPMT**11T308-U3**	▲		▲	▲			.375	—	.156	.031
		1.375—1.875inch 35.0—48.0mm	GPMT**140408-U3**	▲		▲	▲			.500	—	.188	.031

★ : Drill has 4 inserts.

DRILLING

CUTTING CONDITIONS ➤ L190
TECHNICAL DATA ➤ N001

TAF TYPE DRILL

INSERT RECOMMENDATION

CHIP BREAKER RECOMMENDATION

◎ : 1st Recommendation ○ : 2nd Recommendation

Work Material / Breaker	P						M		K				N
	Low Carbon Steel		Medium Carbon Steel		Alloy Steel		Stainless Steel		Gray Cast Iron		Ductile Cast Iron		Aluminum Alloy
	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GPGT
U1	◎	◎	○	○	○	○	○	○	○	○	○	○	
U2	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
U3		○		○		○		○		○		○	

INSERT GRADE RECOMMENDATION

◎ : 1st Recommendation ○ : 2nd Recommendation

Work Material / Breaker	P						M		K				N
	Low Carbon Steel		Medium Carbon Steel		Alloy Steel		Stainless Steel		Gray Cast Iron		Ductile Cast Iron		Aluminum Alloy
	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GPGT
UP20M	◎	◎	○	○	○	○	○	○	○	○	○	○	
GP20M	○		○		○		○		○		○		
UE6020		○		○		○		○		○		○	
US735		○		○		○		○		○		○	
VP15TF		○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
TF15													◎

RECOMMENDED CUTTING CONDITIONS (TAF◌ Series)

	Work Material	Hardness	Cutting Speed (SFM) L/D = 2, L/D = 3 ϕ.469"–ϕ.594" ϕ12.0–ϕ14.5mm	Cutting Speed (SFM) L/D = 2, L/D = 3 ϕ.625"–ϕ2.250" ϕ15.0–ϕ56.0mm	Cutting Speed (SFM) L/D = 4 ϕ.625"–ϕ1.250" ϕ18.0–ϕ340mm	Chip Breaker	Feed (inch/rev) DC ϕ.469"–ϕ.594" ϕ12.0–ϕ14.5mm	Feed (inch/rev) DC ϕ.625"–ϕ.875" ϕ15.0–ϕ22.5mm	Feed (inch/rev) DC ϕ.938"–ϕ1.313" ϕ23.0–ϕ34.0mm	Feed (inch/rev) DC ϕ1.375"–ϕ1.813" ϕ35.0–ϕ48.0mm	Feed (inch/rev) DC ϕ1.938"–ϕ2.250" ϕ49.0–ϕ56.0mm
P	Low Carbon Steel	150 HB	500 (328–650)	656 (500–1000)	500 (328–650)	U1	.002 (.0015–.004)	.0028 (.0015–.004)	.003 (.0015–.004)	.004 (.002–.005)	.003 (.0015–.004)
						U2	.002 (.0015–.004)	.003 (.0015–.005)	.004 (.0015–.005)	.005 (.002–.005)	.004 (.0015–.005)
						U3	–	.003 (.0015–.005)	.004 (.0015–.005)	.005 (.002–.005)	.004 (.0015–.005)
	Medium Carbon Steel	180–280 HB	393 (250–525)	500 (375–600)	325 (262–400)	U1	.002 (.0015–.004)	.003 (.002–.005)	.0045 (.003–.006)	.005 (.003–.007)	.0045 (.003–.006)
						U2	.002 (.0015–.004)	.004 (.002–.006)	.005 (.003–.007)	.006 (.003–.008)	.005 (.003–.007)
						U3	–	.004 (.002–.006)	.005 (.003–.007)	.006 (.003–.008)	.005 (.003–.007)
	Alloy Steel	180–280 HB	393 (250–525)	500 (375–600)	325 (262–400)	U1	.002 (.0015–.004)	.003 (.002–.004)	.003 (.002–.005)	.004 (.003–.005)	.003 (.002–.005)
						U2	.002 (.0015–.004)	.004 (.002–.005)	.004 (.003–.006)	.005 (.003–.007)	.004 (.003–.006)
						U3	–	.004 (.002–.005)	.004 (.003–.006)	.005 (.003–.007)	.004 (.003–.006)
M	Stainless Steel	200 HB	325 (250–400)	500 (375–650)	325 (262–400)	U1	.002 (.0015–.004)	.0025 (.0015–.004)	.003 (.0014–.004)	.004 (.0016–.005)	.003 (.0014–.004)
						U2	.002 (.0015–.004)	.0025 (.0015–.005)	.004 (.0016–.006)	.004 (.0016–.006)	.004 (.0016–.006)
						U3	–	.003 (.0015–.005)	.004 (.0016–.006)	.004 (.0016–.006)	.004 (.0016–.006)
K	Gray Cast Iron	150 HB	400 (250–525)	500 (375–600)	460 (360–525)	U1	.0028 (.002–.004)	.0028 (.002–.004)	.004 (.0016–.005)	.004 (.0016–.005)	.004 (.0016–.005)
						U2	.0028 (.0015–.004)	.006 (.004–.007)	.007 (.004–.010)	.007 (.004–.010)	.007 (.004–.010)
						U3	–	.006 (.004–.007)	.007 (.004–.010)	.007 (.004–.010)	.007 (.004–.010)
	Ductile Cast Iron	140 HB	325 (250–500)	500 (375–600)	325 (250–400)	U1	.0028 (.002–.004)	.0028 (.002–.004)	.004 (.0025–.005)	.004 (.0025–.005)	.004 (.0025–.005)
						U2	.002 (.0015–.004)	.004 (.003–.005)	.006 (.003–.008)	.007 (.003–.008)	.006 (.003–.008)
						U3	–	.004 (.003–.005)	.006 (.003–.008)	.007 (.003–.008)	.006 (.003–.008)
N	Aluminum Alloy	–	–	985 (655–1200)	820 (490–1150)	U2	–	.008 (.006–.012)	.009 (.006–.013)	.010 (.006–.014)	.009 (.006–.013)

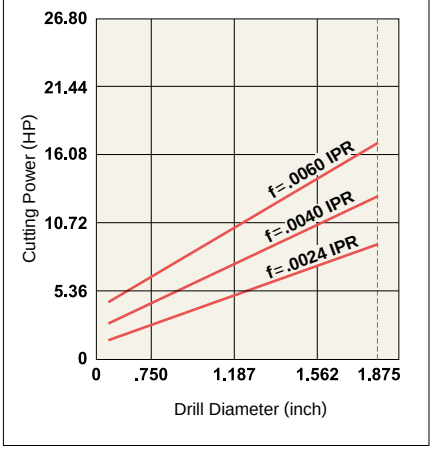
DRILLING

CUTTING PERFORMANCE

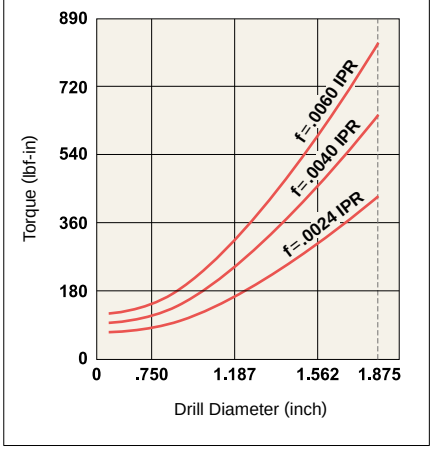
CUTTING RESISTANCE

Workpiece : AISI 4140 (200HB−220HB) Cutting Speed : 490 SFM

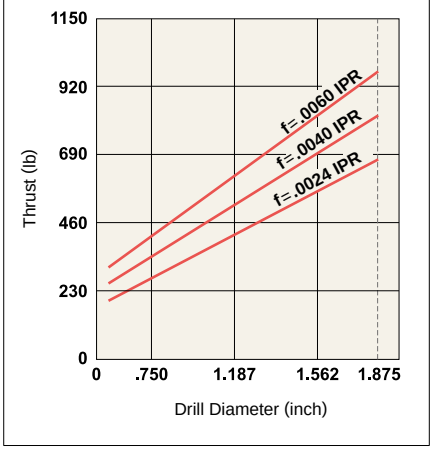
Cutting Power (HP)



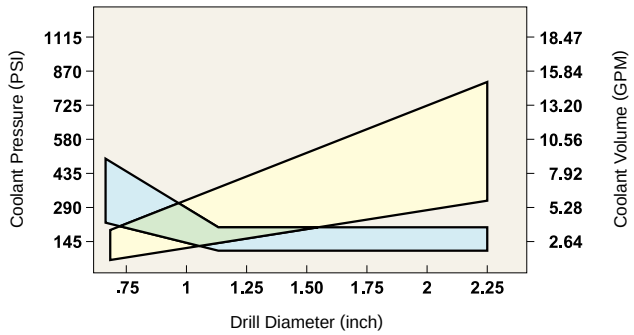
Torque (lbf-in)



Thrust (lb)



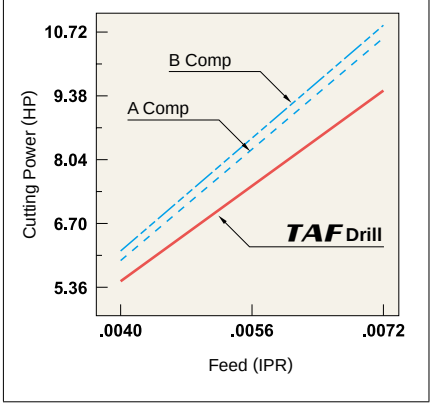
COOLANT VOLUME AND PRESSURE



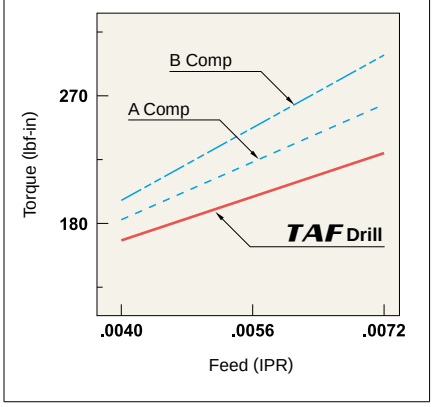
CUTTING RESISTANCE

Workpiece : AISI 4140 (200HB−220HB) Cutting Speed : 490 SFM Drill Diameter : ϕ1.00

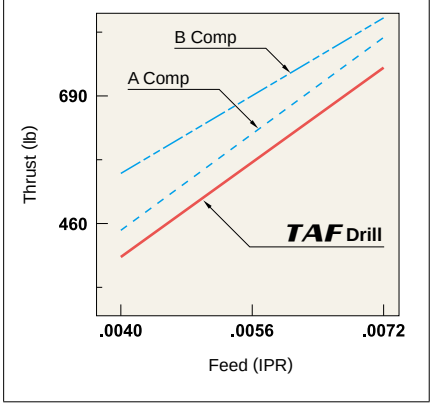
Cutting Power (HP)



Torque (lbf-in)



Thrust (lb)



DRILLING

STAW

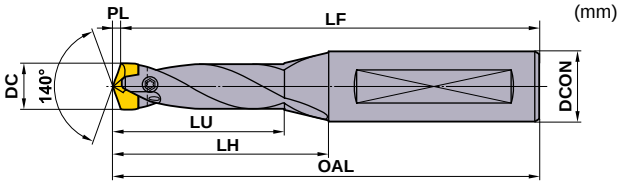
- Wavy cutting edge design for good chip control.
- Highly rigid clamping system offers stability and reliability for small hole drilling.

P M K N S H

DC=10	10<DC<18.4
0 −0.022	0 −0.027

METRIC STANDARD





(mm)

HOLDERS

DC (mm)	Hole Depth (l/d)	Holder Order Number	Stock	LU	LH	OAL	LF	PL	DCON	Wrench	Insert DC (mm)	Insert Order Number	Stock VP15TF	Stock DP5010
10.0 | 10.4	1.5	STAWSS1000S16	★	23.8	33.8	81.8	80	1.8	16	TIP06F	10.0	STAWN1000TH	★	
												STAWK1000TG		★
	3	STAWSN1000S16	★	38.8	48.8	96.8	95	1.8	16	TIP06F	10.1	STAWN1010TH	★	
												STAWK1010TG		★
	5	STAWMN1000S16	★	58.9	68.9	116.9	115	1.9	16	TIP06F	10.2	STAWN1020TH	★	
												STAWK1020TG		★
	8	STAWLN1000S16	★	88.9	98.9	146.9	145	1.9	16	TIP06F	10.3	STAWN1030TH	★	
												STAWK1030TG		★
											10.4	STAWN1040TH	★	
												STAWK1040TG		★
10.5 | 10.9	1.5	STAWSS1050S16	★	23.9	33.9	81.9	80	1.9	16	TIP06F	10.5	STAWN1050TH	★	
												STAWK1050TG		★
	3	STAWSN1050S16	★	38.9	48.9	96.9	95	1.9	16	TIP06F	10.6	STAWN1060TH	★	
												STAWK1060TG		★
	5	STAWMN1050S16	★	59.0	69.0	117.0	115	2.0	16	TIP06F	10.7	STAWN1070TH	★	
												STAWK1070TG		★
	8	STAWLN1050S16	★	89.0	99.0	147.0	145	2.0	16	TIP06F	10.8	STAWN1080TH	★	
												STAWK1080TG		★
											10.9	STAWN1090TH	★	
												STAWK1090TG		★
11.0 | 11.4	1.5	STAWSS1100S16	★	27.0	38.0	86.0	84	2.0	16	TIP06F	11.0	STAWN1100TH	★	
												STAWK1100TG		★
	3	STAWSN1100S16	★	43.0	54.0	102.0	100	2.0	16	TIP06F	11.1	STAWN1110TH	★	
												STAWK1110TG		★
	5	STAWMN1100S16	★	68.1	79.1	127.1	125	2.1	16	TIP06F	11.2	STAWN1120TH	★	
												STAWK1120TG		★
	8	STAWLN1100S16	★	98.1	109.1	157.1	155	2.1	16	TIP06F	11.3	STAWN1130TH	★	
												STAWK1130TG		★
											11.4	STAWN1140TH	★	
												STAWK1140TG		★
11.5 | 11.9	1.5	STAWSS1150S16	★	27.1	38.1	86.1	84	2.1	16	TIP06F	11.5	STAWN1150TH	★	
												STAWK1150TG		★
	3	STAWSN1150S16	★	43.1	54.1	102.1	100	2.1	16	TIP06F	11.6	STAWN1160TH	★	
												STAWK1160TG		★
	5	STAWMN1150S16	★	68.1	79.1	127.1	125	2.1	16	TIP06F	11.7	STAWN1170TH	★	
												STAWK1170TG		★
	8	STAWLN1150S16	★	98.2	109.2	157.2	155	2.2	16	TIP06F	11.8	STAWN1180TH	★	
												STAWK1180TG		★
											11.9	STAWN1190TH	★	
												STAWK1190TG		★
12.0 | 12.4	1.5	STAWSS1200S16	★	29.2	41.2	89.2	87	2.2	16	TIP06F	12.0	STAWN1200TH	★	
												STAWK1200TG		★
	3	STAWSN1200S16	★	47.2	59.2	107.2	105	2.2	16	TIP06F	12.1	STAWN1210TH	★	
												STAWK1210TG		★
	5	STAWMN1200S16	★	72.2	84.2	132.2	130	2.2	16	TIP06F	12.2	STAWN1220TH	★	
												STAWK1220TG		★
	8	STAWLN1200S16	★	107.3	119.3	167.3	165	2.3	16	TIP06F	12.3	STAWN1230TH	★	
												STAWK1230TG		★
											12.4	STAWN1240TH	★	
												STAWK1240TG		★

(Note) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).
The LF, LH, and LU dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the LF, LH and LU dimensions will be slightly reduced.

★ : Inventory maintained in Japan.
<One insert in one case>

DC (mm)	Hole Depth (l/d)	Holder		Dimensions (mm)						Wrench	Insert			
		Order Number	Stock	LU	LH	OAL	LF	PL	DCON		DC (mm)	Order Number	Stock VP15TF	Stock DP5010
12.5 | 12.9	1.5	STAWSS1250S16	★	29.3	41.3	89.3	87	2.3	16	①TIP06F	12.5	STAWN1250TH	★	
												STAWK1250TG		★
	3	STAWSN1250S16	★	47.3	59.3	107.3	105	2.3	16	①TIP06F	12.6	STAWN1260TH	★	
												STAWK1260TG		★
	5	STAWMN1250S16	★	72.3	84.3	132.3	130	2.3	16	①TIP06F	12.7	STAWN1270TH	★	
												STAWK1270TG		★
	8	STAWLN1250S16	★	107.3	119.3	167.3	165	2.3	16	①TIP06F	12.8	STAWN1280TH	★	
												STAWK1280TG		★
											12.9	STAWN1290TH	★	
												STAWK1290TG		★
13.0 | 13.4	1.5	STAWSS1300S16	★	32.4	45.4	93.4	91	2.4	16	②TIP08W	13.0	STAWN1300TH	★	
												STAWK1300TG		★
	3	STAWSN1300S16	★	51.4	64.4	112.4	110	2.4	16	②TIP08W	13.1	STAWN1310TH	★	
												STAWK1310TG		★
	5	STAWMN1300S16	★	76.4	89.4	137.4	135	2.4	16	②TIP08W	13.2	STAWN1320TH	★	
												STAWK1320TG		★
	8	STAWLN1300S16	★	116.4	129.4	177.4	175	2.4	16	②TIP08W	13.3	STAWN1330TH	★	
												STAWK1330TG		★
											13.4	STAWN1340TH	★	
												STAWK1340TG		★
13.5 | 13.9	1.5	STAWSS1350S16	★	32.5	45.5	93.5	91	2.5	16	②TIP08W	13.5	STAWN1350TH	★	
												STAWK1350TG		★
	3	STAWSN1350S16	★	51.5	64.5	112.5	110	2.5	16	②TIP08W	13.6	STAWN1360TH	★	
												STAWK1360TG		★
	5	STAWMN1350S16	★	76.5	89.5	137.5	135	2.5	16	②TIP08W	13.7	STAWN1370TH	★	
												STAWK1370TG		★
	8	STAWLN1350S16	★	116.5	129.5	177.5	175	2.5	16	②TIP08W	13.8	STAWN1380TH	★	
												STAWK1380TG		★
											13.9	STAWN1390TH	★	
												STAWK1390TG		★
14.0 | 14.4	1.5	STAWSS1400S16	★	33.5	47.5	95.5	93	2.5	16	②TIP08W	14.0	STAWN1400TH	★	
												STAWK1400TG		★
	3	STAWSN1400S16	★	55.6	69.6	117.6	115	2.6	16	②TIP08W	14.1	STAWN1410TH	★	
												STAWK1410TG		★
	5	STAWMN1400S16	★	85.6	99.6	147.6	145	2.6	16	②TIP08W	14.2	STAWN1420TH	★	
												STAWK1420TG		★
	8	STAWLN1400S16	★	124.6	139.6	187.6	185	2.6	16	②TIP08W	14.3	STAWN1430TH	★	
												STAWK1430TG		★
											14.4	STAWN1440TH	★	
												STAWK1440TG		★
14.5 | 14.9	1.5	STAWSS1450S16	★	33.6	47.6	95.6	93	2.6	16	②TIP08W	14.5	STAWN1450TH	★	
												STAWK1450TG		★
	3	STAWSN1450S16	★	55.7	69.7	117.7	115	2.7	16	②TIP08W	14.6	STAWN1460TH	★	
												STAWK1460TG		★
	5	STAWMN1450S16	★	85.7	99.7	147.7	145	2.7	16	②TIP08W	14.7	STAWN1470TH	★	
												STAWK1470TG		★
	8	STAWLN1450S16	★	124.7	139.7	187.7	185	2.7	16	②TIP08W	14.8	STAWN1480TH	★	
												STAWK1480TG		★
											14.9	STAWN1490TH	★	
												STAWK1490TG		★
15.0 | 15.4	1.5	STAWSS1500S20	★	35.7	50.7	100.7	98	2.7	20	②TIP08W	15.0	STAWN1500TH	★	
												STAWK1500TG		★
	3	STAWSN1500S20	★	62.7	77.7	127.7	125	2.7	20	②TIP08W	15.1	STAWN1510TH	★	
												STAWK1510TG		★
	5	STAWMN1500S20	★	92.8	107.8	157.8	155	2.8	20	②TIP08W	15.2	STAWN1520TH	★	
												STAWK1520TG		★
	8	STAWLN1500S20	★	132.8	150.8	200.8	198	2.8	20	②TIP08W	15.3	STAWN1530TH	★	
												STAWK1530TG		★
											15.4	STAWN1540TH	★	
												STAWK1540TG		★

(Note) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).
The LF, LH, and LU dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the LF, LH, and LU dimensions will be slightly reduced.

INSERTS ➤ L196
CUTTING CONDITIONS ➤ L200
HOW TO USE ➤ L201
TECHNICAL DATA ➤ N001

STAW

DC (mm)	Hole Depth (l/d)	Holder Order Number	Holder Stock	Dimensions (mm) LU	LH	OAL	LF	PL	DCON	Wrench	Insert DC (mm)	Insert Order Number	Stock VP15TF	Stock DP5010
15.5 | 16.4	1.5	STAWSS1600S20	★	36.8	52.8	102.8	100	2.8	20	TIP10W	15.5	STAWN1550T	★	
												STAWK1550TG		★
											15.6	STAWN1560T	★	
												STAWK1560TG		★
											15.7	STAWN1570T	★	
												STAWK1570TG		★
	3	STAWSN1600S20	★	62.9	82.9	132.9	130	2.9	20	TIP10W	15.8	STAWN1580T	★	
												STAWK1580TG		★
											15.9	STAWN1590T	★	
												STAWK1590TG		★
											16.0	STAWN1600T	★	
												STAWK1600TG		★
	5	STAWMN1600S20	★	92.9	117.9	167.9	165	2.9	20	TIP10W	16.1	STAWN1610T	★	
												STAWK1610TG		★
											16.2	STAWN1620T	★	
												STAWK1620TG		★
	8	STAWLN1600S20	★	140.9	160.9	210.9	208	2.9	20	TIP10W	16.3	STAWN1630T	★	
												STAWK1630TG		★
											16.4	STAWN1640T	★	
												STAWK1640TG		★
16.5 | 17.4	1.5	STAWSS1700S20	★	39.0	56.0	106.0	103	3.0	20	TIP10W	16.5	STAWN1650T	★	
												STAWK1650TG		★
											16.6	STAWN1660T	★	
												STAWK1660TG		★
											16.7	STAWN1670T	★	
												STAWK1670TG		★
	3	STAWSN1700S20	★	64.0	88.0	138.0	135	3.0	20	TIP10W	16.8	STAWN1680T	★	
												STAWK1680TG		★
											16.9	STAWN1690T	★	
												STAWK1690TG		★
											17.0	STAWN1700T	★	
												STAWK1700TG		★
	5	STAWMN1700S20	★	98.1	123.1	173.1	170	3.1	20	TIP10W	17.1	STAWN1710T	★	
												STAWK1710TG		★
											17.2	STAWN1720T	★	
												STAWK1720TG		★
	8	STAWLN1700S20	★	149.1	169.1	219.1	216	3.1	20	TIP10W	17.3	STAWN1730T	★	
												STAWK1730TG		★
											17.4	STAWN1740T	★	
												STAWK1740TG		★
17.5 | 18.4	1.5	STAWSS1800S20	★	40.2	58.2	108.2	105	3.2	20	TIP10W	17.5	STAWN1750T	★	
												STAWK1750TG		★
											17.6	STAWN1760T	★	
												STAWK1760TG		★
											17.7	STAWN1770T	★	
												STAWK1770TG		★
	3	STAWSN1800S20	★	67.2	93.2	143.2	140	3.2	20	TIP10W	17.8	STAWN1780T	★	
												STAWK1780TG		★
											17.9	STAWN1790T	★	
												STAWK1790TG		★
											18.0	STAWN1800T	★	
												STAWK1800TG		★
	5	STAWMN1800S20	★	103.3	128.3	178.3	175	3.3	20	TIP10W	18.1	STAWN1810T	★	
												STAWK1810TG		★
											18.2	STAWN1820T	★	
												STAWK1820TG		★
	8	STAWLN1800S20	★	157.3	177.3	227.3	224	3.3	20	TIP10W	18.3	STAWN1830T	★	
												STAWK1830TG		★
											18.4	STAWN1840T	★	
												STAWK1840TG		★

(Note) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).
The LF, LH, and LU dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the LF, LH, and LU dimensions will be slightly reduced.

★ : Inventory maintained in Japan.
<One insert in one case>

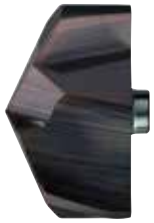
INSERTS ➤ L196
CUTTING CONDITIONS ➤ L200
HOW TO USE ➤ L201
TECHNICAL DATA ➤ N001

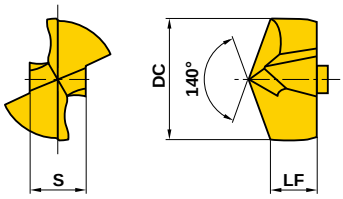
Memo

STAW

INSERTS

(For General Use)





Order Number	Stock		Dimensions (mm)			Applicable Holder
	VP15TF		DC	LF	S	
STAWN1000TH	★		10.0	3.8	4.6	STAWSS1000S16 STAWSN1000S16 STAWMN1000S16 STAWLN1000S16
STAWN**1010TH**	★		10.1	3.8	4.6	
STAWN**1020TH**	★		10.2	3.8	4.6	
STAWN**1030TH**	★		10.3	3.8	4.6	
STAWN**1040TH**	★		10.4	3.8	4.6	
STAWN**1050TH**	★		10.5	4.0	4.8	STAWSS1050S16 STAWSN1050S16 STAWMN1050S16 STAWLN1050S16
STAWN**1060TH**	★		10.6	4.0	4.8	
STAWN**1070TH**	★		10.7	4.0	4.8	
STAWN**1080TH**	★		10.8	4.0	4.8	
STAWN**1090TH**	★		10.9	4.0	4.8	
STAWN**1100TH**	★		11.0	4.2	5.1	STAWSS1100S16 STAWSN1100S16 STAWMN1100S16 STAWLN1100S16
STAWN**1110TH**	★		11.1	4.2	5.1	
STAWN**1120TH**	★		11.2	4.2	5.1	
STAWN**1130TH**	★		11.3	4.2	5.1	
STAWN**1140TH**	★		11.4	4.2	5.1	
STAWN**1150TH**	★		11.5	4.4	5.3	STAWSS1150S16 STAWSN1150S16 STAWMN1150S16 STAWLN1150S16
STAWN**1160TH**	★		11.6	4.4	5.3	
STAWN**1170TH**	★		11.7	4.4	5.3	
STAWN**1180TH**	★		11.8	4.4	5.3	
STAWN**1190TH**	★		11.9	4.4	5.3	
STAWN**1200TH**	★		12.0	4.6	5.5	STAWSS1200S16 STAWSN1200S16 STAWMN1200S16 STAWLN1200S16
STAWN**1210TH**	★		12.1	4.6	5.5	
STAWN**1220TH**	★		12.2	4.6	5.5	
STAWN**1230TH**	★		12.3	4.6	5.5	
STAWN**1240TH**	★		12.4	4.6	5.5	
STAWN**1250TH**	★		12.5	4.8	5.8	STAWSS1250S16 STAWSN1250S16 STAWMN1250S16 STAWLN1250S16
STAWN**1260TH**	★		12.6	4.8	5.8	
STAWN**1270TH**	★		12.7	4.8	5.8	
STAWN**1280TH**	★		12.8	4.8	5.8	
STAWN**1290TH**	★		12.9	4.8	5.8	
STAWN**1300TH**	★		13.0	4.9	6.0	STAWSS1300S16 STAWSN1300S16 STAWMN1300S16 STAWLN1300S16
STAWN**1310TH**	★		13.1	4.9	6.0	
STAWN**1320TH**	★		13.2	4.9	6.0	
STAWN**1330TH**	★		13.3	4.9	6.0	
STAWN**1340TH**	★		13.4	4.9	6.0	
STAWN**1350TH**	★		13.5	5.1	6.2	STAWSS1350S16 STAWSN1350S16 STAWMN1350S16 STAWLN1350S16
STAWN**1360TH**	★		13.6	5.1	6.2	
STAWN**1370TH**	★		13.7	5.1	6.2	
STAWN**1380TH**	★		13.8	5.1	6.2	
STAWN**1390TH**	★		13.9	5.1	6.2	

★ : Inventory maintained in Japan.
<One insert in one case>

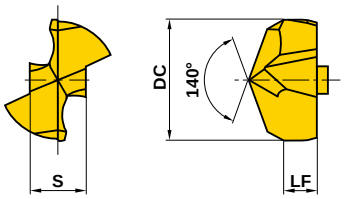
Order Number	Stock		Dimensions (mm)			Applicable Holder
	VP15TF		DC	LF	S	
STAWN1400TH	★		14.0	5.3	6.4	STAWSS1400S16 STAWSN1400S16 STAWMN1400S16 STAWLN1400S16
STAWN**1410TH**	★		14.1	5.3	6.4	
STAWN**1420TH**	★		14.2	5.3	6.4	
STAWN**1430TH**	★		14.3	5.3	6.4	
STAWN**1440TH**	★		14.4	5.3	6.4	
STAWN**1450TH**	★		14.5	5.5	6.7	STAWSS1450S16 STAWSN1450S16 STAWMN1450S16 STAWLN1450S16
STAWN**1460TH**	★		14.6	5.5	6.7	
STAWN**1470TH**	★		14.7	5.5	6.7	
STAWN**1480TH**	★		14.8	5.5	6.7	
STAWN**1490TH**	★		14.9	5.5	6.7	
STAWN**1500TH**	★		15.0	5.7	6.9	STAWSS1500S20 STAWSN1500S20 STAWMN1500S20 STAWLN1500S20
STAWN**1510TH**	★		15.1	5.7	6.9	
STAWN**1520TH**	★		15.2	5.7	6.9	
STAWN**1530TH**	★		15.3	5.7	6.9	
STAWN**1540TH**	★		15.4	5.7	6.9	
STAWN**1550T**	★		15.5	5.9	7.1	STAWSS1600S20 STAWSN1600S20 STAWMN1600S20 STAWLN1600S20
STAWN**1560T**	★		15.6	5.9	7.1	
STAWN**1570T**	★		15.7	5.9	7.1	
STAWN**1580T**	★		15.8	5.9	7.1	
STAWN**1590T**	★		15.9	5.9	7.1	
STAWN**1600T**	★		16.0	5.9	7.1	
STAWN**1610T**	★		16.1	5.9	7.1	
STAWN**1620T**	★		16.2	5.9	7.1	
STAWN**1630T**	★		16.3	5.9	7.1	
STAWN**1640T**	★		16.4	5.9	7.1	
STAWN**1650T**	★		16.5	6.3	7.6	STAWSS1700S20 STAWSN1700S20 STAWMN1700S20 STAWLN1700S20
STAWN**1660T**	★		16.6	6.3	7.6	
STAWN**1670T**	★		16.7	6.3	7.6	
STAWN**1680T**	★		16.8	6.3	7.6	
STAWN**1690T**	★		16.9	6.3	7.6	
STAWN**1700T**	★		17.0	6.3	7.6	
STAWN**1710T**	★		17.1	6.3	7.6	
STAWN**1720T**	★		17.2	6.3	7.6	
STAWN**1730T**	★		17.3	6.3	7.6	
STAWN**1740T**	★		17.4	6.3	7.6	
STAWN**1750T**	★		17.5	6.7	8.1	STAWSS1800S20 STAWSN1800S20 STAWMN1800S20 STAWLN1800S20
STAWN**1760T**	★		17.6	6.7	8.1	
STAWN**1770T**	★		17.7	6.7	8.1	
STAWN**1780T**	★		17.8	6.7	8.1	
STAWN**1790T**	★		17.9	6.7	8.1	
STAWN**1800T**	★		18.0	6.7	8.1	
STAWN**1810T**	★		18.1	6.7	8.1	
STAWN**1820T**	★		18.2	6.7	8.1	
STAWN**1830T**	★		18.3	6.7	8.1	
STAWN**1840T**	★		18.4	6.7	8.1	

STAW

INSERTS

(For Cast Iron)





Order Number	Stock DP5010		Dimensions (mm) DC	LF	S	Applicable Holder
STAWK1000TG	★		10.0	3.3	4.6	STAWSS1000S16 STAWSN1000S16 STAWMN1000S16 STAWLN1000S16
STAWK**1010TG**	★		10.1	3.3	4.6	
STAWK**1020TG**	★		10.2	3.3	4.6	
STAWK**1030TG**	★		10.3	3.3	4.6	
STAWK**1040TG**	★		10.4	3.3	4.6	
STAWK**1050TG**	★		10.5	3.5	4.8	STAWSS1050S16 STAWSN1050S16 STAWMN1050S16 STAWLN1050S16
STAWK**1060TG**	★		10.6	3.5	4.8	
STAWK**1070TG**	★		10.7	3.5	4.8	
STAWK**1080TG**	★		10.8	3.5	4.8	
STAWK**1090TG**	★		10.9	3.5	4.8	
STAWK**1100TG**	★		11.0	3.7	5.1	STAWSS1100S16 STAWSN1100S16 STAWMN1100S16 STAWLN1100S16
STAWK**1110TG**	★		11.1	3.7	5.1	
STAWK**1120TG**	★		11.2	3.7	5.1	
STAWK**1130TG**	★		11.3	3.7	5.1	
STAWK**1140TG**	★		11.4	3.7	5.1	
STAWK**1150TG**	★		11.5	3.9	5.3	STAWSS1150S16 STAWSN1150S16 STAWMN1150S16 STAWLN1150S16
STAWK**1160TG**	★		11.6	3.9	5.3	
STAWK**1170TG**	★		11.7	3.9	5.3	
STAWK**1180TG**	★		11.8	3.9	5.3	
STAWK**1190TG**	★		11.9	3.9	5.3	
STAWK**1200TG**	★		12.0	4.1	5.5	STAWSS1200S16 STAWSN1200S16 STAWMN1200S16 STAWLN1200S16
STAWK**1210TG**	★		12.1	4.1	5.5	
STAWK**1220TG**	★		12.2	4.1	5.5	
STAWK**1230TG**	★		12.3	4.1	5.5	
STAWK**1240TG**	★		12.4	4.1	5.5	
STAWK**1250TG**	★		12.5	4.2	5.8	STAWSS1250S16 STAWSN1250S16 STAWMN1250S16 STAWLN1250S16
STAWK**1260TG**	★		12.6	4.2	5.8	
STAWK**1270TG**	★		12.7	4.2	5.8	
STAWK**1280TG**	★		12.8	4.2	5.8	
STAWK**1290TG**	★		12.9	4.2	5.8	
STAWK**1300TG**	★		13.0	4.4	6.0	STAWSS1300S16 STAWSN1300S16 STAWMN1300S16 STAWLN1300S16
STAWK**1310TG**	★		13.1	4.4	6.0	
STAWK**1320TG**	★		13.2	4.4	6.0	
STAWK**1330TG**	★		13.3	4.4	6.0	
STAWK**1340TG**	★		13.4	4.4	6.0	
STAWK**1350TG**	★		13.5	4.6	6.2	STAWSS1350S16 STAWSN1350S16 STAWMN1350S16 STAWLN1350S16
STAWK**1360TG**	★		13.6	4.6	6.2	
STAWK**1370TG**	★		13.7	4.6	6.2	
STAWK**1380TG**	★		13.8	4.6	6.2	
STAWK**1390TG**	★		13.9	4.6	6.2	

★ : Inventory maintained in Japan.
<One insert in one case>

Order Number	Stock		Dimensions (mm)			Applicable Holder
	DP5010		DC	LF	S	
STAWK1400TG	★		14.0	4.8	6.4	STAWSS1400S16 STAWSN1400S16 STAWMN1400S16 STAWLN1400S16
STAWK**1410TG**	★		14.1	4.8	6.4	
STAWK**1420TG**	★		14.2	4.8	6.4	
STAWK**1430TG**	★		14.3	4.8	6.4	
STAWK**1440TG**	★		14.4	4.8	6.4	
STAWK**1450TG**	★		14.5	5.0	6.7	STAWSS1450S16 STAWSN1450S16 STAWMN1450S16 STAWLN1450S16
STAWK**1460TG**	★		14.6	5.0	6.7	
STAWK**1470TG**	★		14.7	5.0	6.7	
STAWK**1480TG**	★		14.8	5.0	6.7	
STAWK**1490TG**	★		14.9	5.0	6.7	
STAWK**1500TG**	★		15.0	5.2	6.9	STAWSS1500S20 STAWSN1500S20 STAWMN1500S20 STAWLN1500S20
STAWK**1510TG**	★		15.1	5.2	6.9	
STAWK**1520TG**	★		15.2	5.2	6.9	
STAWK**1530TG**	★		15.3	5.2	6.9	
STAWK**1540TG**	★		15.4	5.2	6.9	
STAWK**1550TG**	★		15.5	5.3	7.1	STAWSS1600S20 STAWSN1600S20 STAWMN1600S20 STAWLN1600S20
STAWK**1560TG**	★		15.6	5.3	7.1	
STAWK**1570TG**	★		15.7	5.3	7.1	
STAWK**1580TG**	★		15.8	5.3	7.1	
STAWK**1590TG**	★		15.9	5.3	7.1	
STAWK**1600TG**	★		16.0	5.3	7.1	
STAWK**1610TG**	★		16.1	5.3	7.1	
STAWK**1620TG**	★		16.2	5.3	7.1	
STAWK**1630TG**	★		16.3	5.3	7.1	
STAWK**1640TG**	★		16.4	5.3	7.1	
STAWK**1650TG**	★		16.5	5.7	7.6	STAWSS1700S20 STAWSN1700S20 STAWMN1700S20 STAWLN1700S20
STAWK**1660TG**	★		16.6	5.7	7.6	
STAWK**1670TG**	★		16.7	5.7	7.6	
STAWK**1680TG**	★		16.8	5.7	7.6	
STAWK**1690TG**	★		16.9	5.7	7.6	
STAWK**1700TG**	★		17.0	5.7	7.6	
STAWK**1710TG**	★		17.1	5.7	7.6	
STAWK**1720TG**	★		17.2	5.7	7.6	
STAWK**1730TG**	★		17.3	5.7	7.6	
STAWK**1740TG**	★		17.4	5.7	7.6	
STAWK**1750TG**	★		17.5	6.0	8.1	STAWSS1800S20 STAWSN1800S20 STAWMN1800S20 STAWLN1800S20
STAWK**1760TG**	★		17.6	6.0	8.1	
STAWK**1770TG**	★		17.7	6.0	8.1	
STAWK**1780TG**	★		17.8	6.0	8.1	
STAWK**1790TG**	★		17.9	6.0	8.1	
STAWK**1800TG**	★		18.0	6.0	8.1	
STAWK**1810TG**	★		18.1	6.0	8.1	
STAWK**1820TG**	★		18.2	6.0	8.1	
STAWK**1830TG**	★		18.3	6.0	8.1	
STAWK**1840TG**	★		18.4	6.0	8.1	

STAW

HONE WIDTH

If an insert with honing other than standard is needed, please order using the symbols below.

(Insert Order Number)

S T A W N 1 0 0 0 T ○

- S T A W: TAW Product Name
- N: N : General Use / K : Cuting tooth form for cast iron
- 1 0 0 0: Insert Diameter
- T: Honing Symbol
- ○: Honing Type

(Honing Standard)

Honing Type	Hone Width (inch)
F	0
G	.0008 — .0020
H(Standard)	.0020 — .0039
-	.0039 — .0059
K	.0059 — .0079
S	.0079 — .0098
M	.0098 — .0118

RECOMMENDED CUTTING CONDITIONS

Work Material		DC / Conditions / Hardness	ϕ10.0—ϕ12.9mm		ϕ13.0—ϕ13.9mm		ϕ14.0—ϕ15.4mm		ϕ15.5—ϕ18.4mm	
			Cutting Speed (SFM)	Feed (IPR)	Cutting Speed (SFM)	Feed (IPR)	Cutting Speed (SFM)	Feed (IPR)	Cutting Speed (SFM)	Feed (IPR)
P	Mild Steel	≤180HB	260 (195—330)	.008 (.006—.010)	295 (230—360)	.010 (.008—.012)	330 (260—390)	.012 (.010—.014)	330 (260—390)	.014 (.010—.016)
P	Carbon Steel Alloy Steel	180—280HB	260 (195—330)	.008 (.006—.010)	295 (230—360)	.010 (.008—.012)	330 (260—390)	.012 (.010—.014)	330 (260—390)	.014 (.010—.016)
P	Carbon Steel Alloy Steel	280—350HB	230 (195—295)	.008 (.006—.010)	260 (195—330)	.010 (.008—.012)	295 (230—360)	.010 (.008—.012)	295 (230—360)	.012 (.008—.014)
M	Stainless Steel	≤200HB	130 (100—165)	.005 (.004—.006)	165 (130—195)	.006 (.005—.007)	195 (165—230)	.007 (.006—.008)	195 (165—230)	.006 (.005—.008)
K	Gray Cast Iron	Tensile Strength ≤350MPa	260 (195—330)	.008 (.006—.010)	295 (230—360)	.010 (.008—.012)	330 (260—390)	.012 (.010—.014)	390 (260—460)	.018 (.014—.022)
K	Ductile Cast Iron	Tensile Strength ≤450MPa	230 (195—295)	.008 (.006—.010)	260 (195—330)	.010 (.008—.012)	295 (230—360)	.012 (.010—.014)	330 (260—390)	.014 (.010—.016)

(Note 1) When using a drill for 1.5DC depth of hole, it is possible to increase the feed rate by approx. 20%.
(Note 2) When using a drill for 8DC depth of hole, please decrease the cutting speed by approx. 20%.
(Note 3) When using a drill for 8DC depth of hole, it is recommended to make a pilot hole of the same size.
(Note 4) For stainless steel, please use internal coolant. (Mist & MQL are not recommended).

SPARE PARTS

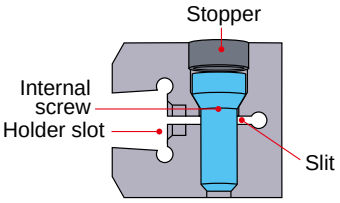
Applicable Holder	Pack Order Number (Internal screw & stopper)	 Internal Screw	 Stopper
STAWSS/SN/MN/LN1000S16	WS203107TPS-35LH	WS203107TPS	WS35LH
STAWSS/SN/MN/LN1050S16	WS203107TPS-35LH	WS203107TPS	WS35LH
STAWSS/SN/MN/LN1100S16	WS203108TPS-35LH	WS203108TPS	WS35LH
STAWSS/SN/MN/LN1150S16	WS203108TPS-35LH	WS203108TPS	WS35LH
STAWSS/SN/MN/LN1200S16	WS203108TPS-35LH	WS203108TPS	WS35LH
STAWSS/SN/MN/LN1250S16	WS203108TPS-35LH	WS203108TPS	WS35LH
STAWSS/SN/MN/LN1300S16	WS253909TPS-45LH	WS253909TPS	WS45LH
STAWSS/SN/MN/LN1350S16	WS253909TPS-45LH	WS253909TPS	WS45LH
STAWSS/SN/MN/LN1400S16	WS253909TPS-45LH	WS253909TPS	WS45LH
STAWSS/SN/MN/LN1450S16	WS253909TPS-45LH	WS253909TPS	WS45LH
STAWSS/SN/MN/LN1500S20	WS253909TPS-45LH	WS253909TPS	WS45LH
STAWSS/SN/MN/LN1600S20	WS304912TPS-55LH	WS304912TPS	WS55LH
STAWSS/SN/MN/LN1700S20	WS304912TPS-55LH	WS304912TPS	WS55LH
STAWSS/SN/MN/LN1800S20	WS304912TPS-55LH	WS304912TPS	WS55LH

∗ Clamp Torque (lbf-in) : WS203107TPS=8.9, WS203108TPS=8.9, WS253909TPS=17.7, WS304912TPS=22.1
(Note) The parts included in the package are internal screw, stopper and operation manual. Please replace the parts in accordance with the operation manual.

NOTES ON USE

INSERT INSTALLATION

1. Before inserting the insert into the holder, ensure that there are no foreign objects or dirt in the holder slot or slit. Clean using compressed air if necessary.



2. Use the wrench provided to loosen the inner screw to open the tip of the holder, then place the insert into the holder slot as shown in figure 1.
   ⁎Ensure that the wrench is firmly in contact with the base of the inner screw head when tightening.

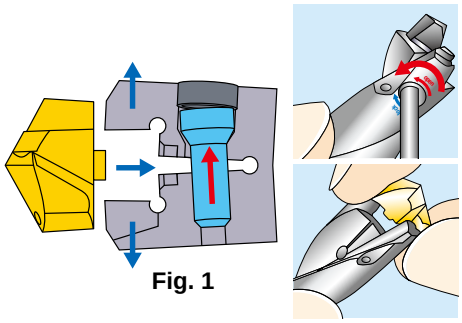


Fig. 1

3. After the insert has been set in the holder slot, tighten the inner screw while pushing the insert lightly into the pocket as shown in figure 2 to securely clamp and locate the insert.
   ⁎Ensure that the wrench is firmly in contact with the base of the inner screw head when tightening.

Tighten clamp screws referring to the table for torque.

DC (mm)	Clamping Force	
	lbf-in	N · m
10—12.5	8.9	1
13—15	17.7	2
16—18	22.1	2.5

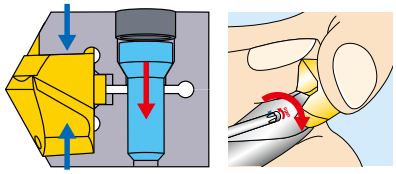
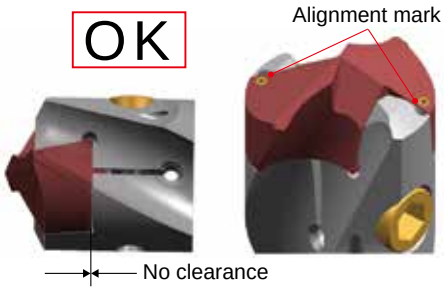
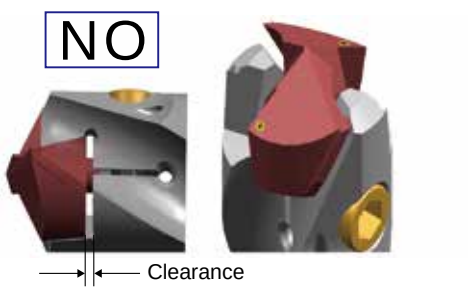


Fig. 2

4. Check there is no gap between the bottom of the insert and holder slot.





(Note) Poor or incorrect clamping of inserts can cause poor drilling performance and/or drill breakage.
Therefore ensure that the alignment marks on both the body and insert are aligned when setting.
When machining, use safety guards and eye protection.

TAW

- Wavy cutting edge design for good chip control.
- Serration geometry for accurate insert location.

P M K N S H

.5625≤DC≤.6875	.7031≤DC≤1.1719	DC=1.1875
−.00063 −.00134	−.00079 −.00161	−.00098 −.00197

(inch)

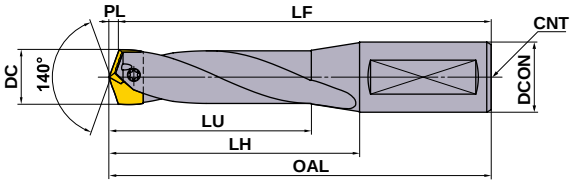
INCH STANDARD

L/D=3

Internal Coolant







Holder		Dimensions (inch)							*	① ②			DC (inch)	Insert	
Order Number	Stock	LU	LH	OAL	LF	PL	DCON	CNT	Insert Screw	Wrench	Plate	Anti-seize Lubricant		Order Number	Stock VP15TF
TAWSNH0036	●	2.110	2.740	4.615	4.513	.102	.625	1/8-27	WS254012T	①TKY08W	WPT4405	MK1KS	.5625	**TAWNH0036T**	●
TAWSNH**0037**	●	2.231	3.058	4.933	4.828	.105	.625	1/8-27	WS254013T	①TKY08W	WPT4405	MK1KS	.5781	**TAWNH0037T**	●
TAWSNH**0039**	●	2.234	3.061	5.061	4.953	.108	.750	1/8-27	WS254013T	①TKY08W	WPT4405	MK1KS	.5938	**TAWNH0038T**	●
													.6094	**TAWNH0039T**	●
TAWSN0041	●	2.397	3.264	5.264	5.150	.114	.750	1/8-27	WS254014T	①TKY08W	WPT4405	MK1KS	.6250	**TAWNH0040T**	●
													.6406	**TAWNH0041T**	●
TAWSN**0044**	●	2.521	3.465	5.465	5.346	.119	.750	1/8-27	WS254015T	①TKY08W	WPT4405	MK1KS	.6563	**TAWNH0042T**	●
													.6719	**TAWNH0043T**	●
													.6875	**TAWNH0044T**	●
TAWSN**0045**	●	2.687	3.671	5.671	5.543	.128	.750	1/8-27	WS254016T	①TKY08W	WPT4405	MK1KS	.7031	**TAWNH0045T**	●
TAWSN**0046**	●	2.690	3.674	5.924	5.793	.131	1.000	1/8-27	WS254016T	①TKY08W	WPT4405	MK1KS	.7188	**TAWNH0046T**	●
TAWSN**0049**	●	2.811	4.032	6.282	6.148	.134	1.000	1/8-27	WS304517T	②TKY10T	WPT4405	MK1KS	.7344	**TAWNH0047T**	●
													.7500	**TAWNH0048T**	●
													.7656	**TAWNH0049T**	●
TAWSN**0051**	●	2.977	4.040	6.290	6.148	.142	1.000	1/8-27	WS304518T	②TKY10T	WPT4405	MK1KS	.7813	**TAWNH0050T**	●
													.7969	**TAWNH0051T**	●
TAWSN**0054**	●	3.101	4.046	6.296	6.148	.148	1.000	1/8-27	WS304518T	②TKY10T	WPT4405	MK1KS	.8125	**TAWNH0052T**	●
													.8281	**TAWNH0053T**	●
													.8438	**TAWNH0054T**	●
TAWSN**0056**	●	3.266	4.250	6.500	6.344	.156	1.000	1/8-27	WS355520T	②TKY15T	WPT4405	MK1KS	.8594	**TAWNH0055T**	●
													.8750	**TAWNH0056T**	●

* Clamp Torque (lbf-in) : WS254012T=18, WS254013T=18, WS254014T=18, WS254015T=18, WS254016T=18, WS304517T=31, WS304518T=31, WS355520T=49

(Note 1) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).

The LF, LH, and LU dimensions listed in the table above, are measured using the VP15TF insert.

When using the DP5010 insert, the LF, LH and LU dimensions will be slightly reduced.

● : Inventory maintained.

Holder		Dimensions (inch)							*				DC (inch)	Insert	
Order Number	Stock	LU	LH	OAL	LF	PL	DCON	CNT	Insert Screw	Wrench	Plate	Anti-seize Lubricant		Order Number	Stock VP15TF
TAWSN0059	●	3.390	4.256	6.506	6.344	.162	1.000	1/8-27	WS355521T	TKY15T	WPT4405	MK1KS	.8906	**TAWNH0057T**	●
													.9063	**TAWNH0058T**	●
													.9219	**TAWNH0059T**	●
TAWSN0061	●	3.557	4.502	6.877	6.706	.171	1.250	1/4-18	WS355521T	TKY15T	WPT4405	MK1KS	.9375	**TAWNH0060T**	●
													.9531	**TAWNH0061T**	●
TAWSN0100	●	3.641	4.507	6.882	6.706	.176	1.250	1/4-18	WS406023T	TKY25T	WPT4405	MK1KS	.9688	**TAWNH0062T**	●
													.9844	**TAWNH0063T**	●
													1.0000	**TAWNH0100T**	●
TAWSN0102	●	3.807	4.713	7.088	6.903	.185	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0156	**TAWNH0101T**	●
													1.0313	**TAWNH0102T**	●
TAWSN0105	●	3.892	4.719	7.094	6.903	.191	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0469	**TAWNH0103T**	●
													1.0625	**TAWNH0104T**	●
													1.0781	**TAWNH0105T**	●
TAWSN0107	●	4.018	4.923	7.298	7.099	.199	1.250	1/4-18	WS508026T	TKY27T	WPT4405	MK1KS	1.0938	**TAWNH0106T**	●
													1.1094	**TAWNH0107T**	●
TAWSN0110	●	4.142	5.126	7.501	7.296	.205	1.250	1/4-18	WS508027T	TKY27T	WPT4405	MK1KS	1.1250	**TAWNH0108T**	●
													1.1406	**TAWNH0109T**	●
													1.1563	**TAWNH0110T**	●
TAWSN0112	●	4.307	5.134	7.509	7.296	.213	1.250	1/4-18	WS508027T	TKY27T	WPT4405	MK1KS	1.1719	**TAWNH0111T**	●
													1.1875	**TAWNH0112T**	●

* Clamp Torque (lbf-in) : WS355521T=49, WS406023T=75, WS406024T=75, WS508026T=110, WS508027T=110

(Note 1) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).
The LF, LH and LU dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the LF, LH and LU dimensions will be slightly reduced.

DRILLING

INSERTS ➤ L211
CUTTING CONDITIONS ➤ L210
HOW TO USE ➤ L210
TECHNICAL DATA ➤ N001

TAW

- Wavy cutting edge design for good chip control.
- Serration geometry for accurate insert location.

P | M | K | N | S | H

.5625≤DC≤.6875	.7031≤DC≤1.1719	DC=1.1875
−.00063 −.00134	−.00079 −.00161	−.00098 −.00197

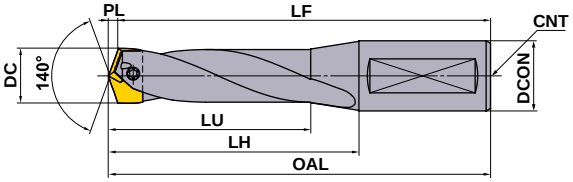
(inch)

INCH STANDARD

L/D=5

Internal Coolant





Holder		Dimensions (inch)							*	① ②			DC (inch)	Insert	
Order Number	Stock	LU	LH	OAL	LF	PL	DCON	CNT	Insert Screw	Wrench	Plate	Anti-seize Lubricant		Order Number	Stock VP15TF
TAWMNH0036	●	3.252	3.921	5.796	5.694	.102	.625	1/8-27	WS254012T	①TKY08W	WPT4405	MK1KS	.5625	**TAWNH0036T**	●
TAWMNH**0037**	●	3.451	4.239	6.114	6.009	.105	.625	1/8-27	WS254013T	①TKY08W	WPT4405	MK1KS	.5781	**TAWNH0037T**	●
TAWMNH**0039**	●	3.454	4.242	6.242	6.134	.108	.750	1/8-27	WS254013T	①TKY08W	WPT4405	MK1KS	.5938	**TAWNH0038T**	●
													.6094	**TAWNH0039T**	●
TAWMN0041	●	3.697	4.642	6.642	6.528	.114	.750	1/8-27	WS254014T	①TKY08W	WPT4405	MK1KS	.6250	**TAWNH0040T**	●
													.6406	**TAWNH0041T**	●
TAWMN**0044**	●	3.899	4.843	6.843	6.724	.119	.750	1/8-27	WS254015T	①TKY08W	WPT4405	MK1KS	.6563	**TAWNH0042T**	●
													.6719	**TAWNH0043T**	●
													.6875	**TAWNH0044T**	●
TAWMN**0045**	●	4.144	5.049	7.049	6.921	.128	.750	1/8-27	WS254016T	①TKY08W	WPT4405	MK1KS	.7031	**TAWNH0045T**	●
TAWMN**0046**	●	4.147	5.052	7.302	7.171	.131	1.000	1/8-27	WS254016T	①TKY08W	WPT4405	MK1KS	.7188	**TAWNH0046T**	●
TAWMN**0049**	●	4.347	5.410	7.660	7.526	.134	1.000	1/8-27	WS304517T	②TKY10T	WPT4405	MK1KS	.7344	**TAWNH0047T**	●
													.7500	**TAWNH0048T**	●
													.7656	**TAWNH0049T**	●
TAWMN**0051**	●	4.591	5.614	7.864	7.722	.142	1.000	1/8-27	WS304518T	②TKY10T	WPT4405	MK1KS	.7813	**TAWNH0050T**	●
													.7969	**TAWNH0051T**	●
TAWMN**0054**	●	4.794	5.620	7.870	7.722	.148	1.000	1/8-27	WS304518T	②TKY10T	WPT4405	MK1KS	.8125	**TAWNH0052T**	●
													.8281	**TAWNH0053T**	●
													.8438	**TAWNH0054T**	●

* Clamp Torque (lbf-in) : WS254012T=18, WS254013T=18, WS254014T=18, WS254015T=18, WS254016T=18, WS304517T=31, WS304518T=31, WS355520T=49

(Note 1) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).

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When using the DP5010 insert, the LF, LH and LU dimensions will be slightly reduced.

● : Inventory maintained.

Holder		Dimensions (inch)							*				DC (inch)	Insert	
Order Number	Stock	LU	LH	OAL	LF	PL	DCON	CNT	Insert Screw	Wrench	Plate	Anti-seize Lubricant		Order Number	Stock VP15TF
TAWMN0056	●	5.038	5.825	8.075	7.919	.156	1.000	1/8-27	WS355520T	TKY15T	WPT4405	MK1KS	.8594	**TAWNH0055T**	●
													.8750	**TAWNH0056T**	●
TAWMN**0059**	●	5.241	6.225	8.475	8.313	.162	1.000	1/8-27	WS355521T	TKY15T	WPT4405	MK1KS	.8906	**TAWNH0057T**	●
													.9063	**TAWNH0058T**	●
													.9219	**TAWNH0059T**	●
TAWMN**0061**	●	5.486	6.470	8.845	8.674	.171	1.250	1/4-18	WS355521T	TKY15T	WPT4405	MK1KS	.9375	**TAWNH0060T**	●
													.9531	**TAWNH0061T**	●
TAWMN**0100**	●	5.688	6.672	9.047	8.871	.176	1.250	1/4-18	WS406023T	TKY25T	WPT4405	MK1KS	.9688	**TAWNH0062T**	●
													.9844	**TAWNH0063T**	●
													1.0000	**TAWNH0100T**	●
TAWMN**0102**	●	5.933	6.878	9.253	9.068	.185	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0156	**TAWNH0101T**	●
													1.0313	**TAWNH0102T**	●
TAWMN**0105**	●	6.136	7.081	9.456	9.265	.191	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0469	**TAWNH0103T**	●
													1.0625	**TAWNH0104T**	●
													1.0781	**TAWNH0105T**	●
TAWMN**0107**	●	6.380	7.286	9.661	9.462	.199	1.250	1/4-18	WS508026T	TKY27T	WPT4405	MK1KS	1.0938	**TAWNH0106T**	●
													1.1094	**TAWNH0107T**	●
TAWMN**0110**	●	6.583	7.488	9.863	9.658	.205	1.250	1/4-18	WS508027T	TKY27T	WPT4405	MK1KS	1.1250	**TAWNH0108T**	●
													1.1406	**TAWNH0109T**	●
													1.1563	**TAWNH0110T**	●
TAWMN**0112**	●	6.788	7.890	10.265	10.052	.213	1.250	1/4-18	WS508027T	TKY27T	WPT4405	MK1KS	1.1719	**TAWNH0111T**	●
													1.1875	**TAWNH0112T**	●

* Clamp Torque (lbf-in) : WS355521T=49, WS406023T=75, WS406024T=75, WS508026T=110, WS508027T=110

(Note 1) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).
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DRILLING

INSERTS ➤ L211
CUTTING CONDITIONS ➤ L210
HOW TO USE ➤ L210
TECHNICAL DATA ➤ N001

TAW

- Wavy cutting edge design for good chip control.
- Serration geometry for accurate insert location.

P M K N S H

.5625≤DC≤.6875	.7031≤DC≤1.1719	DC=1.1875
−.00063 −.00134	−.00079 −.00161	−.00098 −.00197

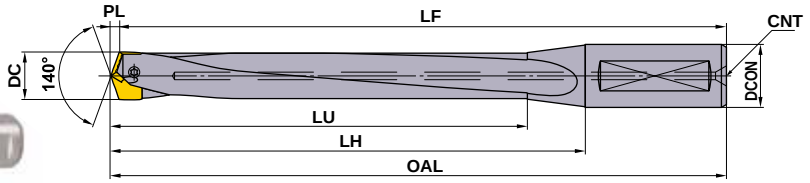
(inch)

INCH STANDARD

L/D=8

Internal Coolant





Holder		Dimensions (inch)							*	① ②			DC (inch)	Insert	
Order Number	Stock	LU	LH	OAL	LF	PL	DCON	CNT	Insert Screw	Wrench	Plate	Anti-seize Lubricant		Order Number	Stock VP15TF
TAWLNH0036	●	4.905	5.496	7.370	7.268	.102	.625	1/8-27	WS254012T	①TKY08W	WPT4405	MK1KS	.5625	**TAWNH0036T**	●
TAWLNH**0037**	●	5.223	5.932	7.806	7.701	.105	.625	1/8-27	WS254013T	①TKY08W	WPT4405	MK1KS	.5781	**TAWNH0037T**	●
TAWLNH**0039**	●	5.226	5.935	7.935	7.827	.108	.750	1/8-27	WS254013T	①TKY08W	WPT4405	MK1KS	.5938	**TAWNH0038T**	●
													.6094	**TAWNH0039T**	●
TAWLN0041	●	5.547	6.334	8.334	8.220	.114	.750	1/8-27	WS254014T	①TKY08W	WPT4405	MK1KS	.6250	**TAWNH0040T**	●
													.6406	**TAWNH0041T**	●
TAWLN**0044**	●	5.867	6.654	8.654	8.535	.119	.750	1/8-27	WS254015T	①TKY08W	WPT4405	MK1KS	.6563	**TAWNH0042T**	●
													.6719	**TAWNH0043T**	●
													.6875	**TAWNH0044T**	●
TAWLN**0045**	●	6.191	6.978	8.978	8.850	.128	.750	1/8-27	WS254016T	①TKY08W	WPT4405	MK1KS	.7031	**TAWNH0045T**	●
TAWLN**0046**	●	6.194	6.981	9.233	9.102	.131	1.000	1/8-27	WS254016T	①TKY08W	WPT4405	MK1KS	.7188	**TAWNH0046T**	●
TAWLN**0049**	●	6.512	7.417	9.669	9.535	.134	1.000	1/8-27	WS304517T	②TKY10T	WPT4405	MK1KS	.7344	**TAWNH0047T**	●
													.7500	**TAWNH0048T**	●
													.7656	**TAWNH0049T**	●
TAWLN**0051**	●	6.835	7.740	9.992	9.850	.142	1.000	1/8-27	WS304518T	②TKY10T	WPT4405	MK1KS	.7813	**TAWNH0050T**	●
													.7969	**TAWNH0051T**	●
TAWLN**0054**	●	7.156	8.101	10.353	10.205	.148	1.000	1/8-27	WS304518T	②TKY10T	WPT4405	MK1KS	.8125	**TAWNH0052T**	●
													.8281	**TAWNH0053T**	●
													.8438	**TAWNH0054T**	●

* Clamp Torque (lbf-in) : WS254012T=18, WS254013T=18, WS254014T=18, WS254015T=18, WS254016T=18, WS304517T=31, WS304518T=31, WS355520T=49

(Note 1) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).

The LF, LH and LU dimensions listed in the table above, are measured using the VP15TF insert.

When using the DP5010 insert, the LF, LH and LU dimensions will be slightly reduced.

● : Inventory maintained.

Holder		Dimensions (inch)							*				DC (inch)	Insert	
Order Number	Stock	LU	LH	OAL	LF	PL	DCON	CNT	Insert Screw	Wrench	Plate	Anti-seize Lubricant		Order Number	Stock VP15TF
TAWLN0056	●	7.479	8.424	10.676	10.520	.156	1.000	1/8-27	WS355520T	TKY15T	WPT4405	MK1KS	.8594	**TAWNH0055T**	●
													.8750	**TAWNH0056T**	●
TAWLN0059	●	7.800	8.942	11.193	11.031	.162	1.000	1/8-27	WS355521T	TKY15T	WPT4405	MK1KS	.8906	**TAWNH0057T**	●
													.9063	**TAWNH0058T**	●
													.9219	**TAWNH0059T**	●
TAWLN0061	●	8.124	9.305	11.679	11.508	.171	1.250	1/4-18	WS355521T	TKY15T	WPT4405	MK1KS	.9375	**TAWNH0060T**	●
													.9531	**TAWNH0061T**	●
TAWLN0100	●	8.444	9.625	11.999	11.823	.176	1.250	1/4-18	WS406023T	TKY25T	WPT4405	MK1KS	.9688	**TAWNH0062T**	●
													.9844	**TAWNH0063T**	●
													1.0000	**TAWNH0100T**	●
TAWLN0102	●	8.768	9.949	12.323	12.138	.185	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0156	**TAWNH0101T**	●
													1.0313	**TAWNH0102T**	●
TAWLN0105	●	9.089	10.270	12.644	12.453	.191	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0469	**TAWNH0103T**	●
													1.0625	**TAWNH0104T**	●
													1.0781	**TAWNH0105T**	●
TAWLN0107	●	9.412	10.593	12.967	12.768	.199	1.250	1/4-18	WS508026T	TKY27T	WPT4405	MK1KS	1.0938	**TAWNH0106T**	●
													1.1094	**TAWNH0107T**	●
TAWLN0110	●	9.733	10.914	13.288	13.083	.205	1.250	1/4-18	WS508027T	TKY27T	WPT4405	MK1KS	1.1250	**TAWNH0108T**	●
													1.1406	**TAWNH0109T**	●
													1.1563	**TAWNH0110T**	●
TAWLN0112	●	10.056	11.433	13.807	13.594	.213	1.250	1/4-18	WS508027T	TKY27T	WPT4405	MK1KS	1.1719	**TAWNH0111T**	●
													1.1875	**TAWNH0112T**	●

* Clamp Torque (lbf-in) : WS355521T=49, WS406023T=75, WS406024T=75, WS508026T=110, WS508027T=110

(Note 1) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).
The LF, LH and LU dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the LF, LH and LU dimensions will be slightly reduced.

DRILLING

INSERTS ➤ L211
CUTTING CONDITIONS ➤ L210
HOW TO USE ➤ L210
TECHNICAL DATA ➤ N001

TAW

- Wavy cutting edge design for good chip control.
- Serration geometry for accurate insert location.

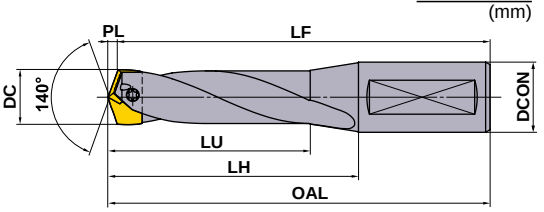
P | M | K | N | S | H

18<DC≤30
0
−0.021
(mm)

METRIC STANDARD

Internal Coolant





Hole Depth (l/d)	Holder Order Number	Stock	LU	LH	OAL	LF	PL	DCON	Insert Screw *	Wrench	Plate	Anti-seize Lubricant	DC (mm)	Insert Order Number	Stock VP15TF	Stock DP5010
3	TAWSN1900S25	★	71.4	102.4	158.4	155.0	3.4	25	WS304517T	TKY10T	WPT4405	MK1KS	18.5	TAWNH1850T	●	
														TAWKH1850TG		★
													18.6	TAWNH1860T	●	
														TAWKH1860TG		★
													18.7	TAWNH1870T	●	
														TAWKH1870TG		★
5	TAWMN1900S25	★	110.4	137.4	193.4	190.0	3.4	25	WS304517T	TKY10T	WPT4405	MK1KS	18.8	TAWNH1880T	●	
														TAWKH1880TG		★
													18.9	TAWNH1890T	●	
														TAWKH1890TG		★
													19.0	TAWNH1900T	●	
														TAWKH1900TG		★
													19.1	TAWNH1910T	●	
														TAWKH1910TG		★
8	TAWLN1900S25	★	165.5	188.5	244.5	241.0	3.5	25	WS304517T	TKY10T	WPT4405	MK1KS	19.2	TAWNH1920T	●	
														TAWKH1920TG		★
													19.3	TAWNH1930T	●	
														TAWKH1930TG		★
													19.4	TAWNH1940T	●	
														TAWKH1940TG		★
3	TAWSN2000S25	★	75.5	102.5	158.5	155.0	3.5	25	WS304518T	TKY10T	WPT4405	MK1KS	19.5	TAWNH1950T	●	
														TAWKH1950TG		★
													19.6	TAWNH1960T	●	
														TAWKH1960TG		★
5	TAWMN2000S25	★	116.6	142.6	198.6	195.0	3.6	25	WS304518T	TKY10T	WPT4405	MK1KS	19.7	TAWNH1970T	●	
														TAWKH1970TG		★
													19.8	TAWNH1980T	●	
														TAWKH1980TG		★
8	TAWLN2000S25	★	173.7	196.7	252.7	249.0	3.7	25	WS304518T	TKY10T	WPT4405	MK1KS	19.9	TAWNH1990T	●	
														TAWKH1990TG		★
													20.0	TAWNH2000T	●	
														TAWKH2000TG		★
3	TAWSN2100S25	★	78.7	102.7	158.7	155.0	3.7	25	WS304518T	TKY10T	WPT4405	MK1KS	20.5	TAWNH2050T	●	
5	TAWMN2100S25	★	121.8	142.8	198.8	195.0	3.8	25	WS304518T	TKY10T	WPT4405	MK1KS		TAWKH2050TG		★
8	TAWLN2100S25	★	181.9	205.9	261.9	258.0	3.9	25	WS304518T	TKY10T	WPT4405	MK1KS	21.0	TAWNH2100T	●	
														TAWKH2100TG		★
3	TAWSN2200S25	★	83.2	108.2	164.2	160.3	3.9	25	WS355520T	TKY15T	WPT4405	MK1KS	21.5	TAWNH2150T	●	
5	TAWMN2200S25	★	128.3	148.3	204.3	200.3	4.0	25	WS355520T	TKY15T	WPT4405	MK1KS		TAWKH2150TG		★
8	TAWLN2200S25	★	190.0	214.0	270.0	266.0	4.0	25	WS355520T	TKY15T	WPT4405	MK1KS	22.0	TAWNH2200T	●	
														TAWKH2200TG		★

★ Clamp Torque (lbf-in) : WS304517T=31, WS304518T=31, WS355520T=49

(Note) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).
The LF, LH and LU dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the LF, LH and LU dimensions will be slightly reduced.

● : Inventory maintained. ★ : Inventory maintained in Japan.

Hole Depth l/d	Holder Order Number	Stock	Dimensions (mm) LU	LH	OAL	LF	PL	DCON	* Insert Screw	Wrench	Plate	Anti-seize Lubricant	DC (mm)	Insert Order Number	Stock VP15TF	Stock DP5010
3	**TAWSN2300S25**	★	86.4	108.4	164.4	160.3	4.1	25	WS355521T	TKY15T	WPT4405	MK1KS	22.5	**TAWNH2250T**	●	
5	**TAWMN2300S25**	★	133.4	158.4	214.4	210.3	4.1	25	WS355521T	TKY15T	WPT4405	MK1KS		**TAWKH2250TG**		★
8	**TAWLN2300S25**	★	198.2	227.2	283.2	279.0	4.2	25	WS355521T	TKY15T	WPT4405	MK1KS	23.0	**TAWNH2300T**	●	
														TAWKH2300TG		★
3	**TAWSN2400S32**	★	90.6	114.6	174.6	170.3	4.3	32	WS355521T	TKY15T	WPT4405	MK1KS	23.5	**TAWNH2350T**	●	
5	**TAWMN2400S32**	★	139.6	164.6	224.6	220.3	4.3	32	WS355521T	TKY15T	WPT4405	MK1KS		**TAWKH2350TG**		★
8	**TAWLN2400S32**	★	206.4	236.4	296.4	292.0	4.4	32	WS355521T	TKY15T	WPT4405	MK1KS	24.0	**TAWNH2400T**	●	
														TAWKH2400TG		★
3	**TAWSN2500S32**	★	93.1	115.1	175.1	170.6	4.5	32	WS406023T	TKY25T	WPT4405	MK1KS	24.5	**TAWNH2450T**	●	
5	**TAWMN2500S32**	★	145.1	170.1	230.1	225.6	4.5	32	WS406023T	TKY25T	WPT4405	MK1KS		**TAWKH2450TG**		★
8	**TAWLN2500S32**	★	214.6	244.6	304.6	300.0	4.6	32	WS406023T	TKY25T	WPT4405	MK1KS	25.0	**TAWNH2500T**	●	
														TAWKH2500TG		★
3	**TAWSN2600S32**	★	97.2	120.2	180.2	175.6	4.6	32	WS406024T	TKY25T	WPT4405	MK1KS	25.5	**TAWNH2550T**	●	
5	**TAWMN2600S32**	★	151.3	175.3	235.3	230.6	4.7	32	WS406024T	TKY25T	WPT4405	MK1KS		**TAWKH2550TG**		★
8	**TAWLN2600S32**	★	222.8	252.8	312.8	308.0	4.8	32	WS406024T	TKY25T	WPT4405	MK1KS	26.0	**TAWNH2600T**	●	
														TAWKH2600TG		★
3	**TAWSN2700S32**	★	99.4	120.4	180.4	175.6	4.8	32	WS406024T	TKY25T	WPT4405	MK1KS	26.5	**TAWNH2650T**	●	
5	**TAWMN2700S32**	★	156.5	180.5	240.5	235.6	4.9	32	WS406024T	TKY25T	WPT4405	MK1KS		**TAWKH2650TG**		★
8	**TAWLN2700S32**	★	230.9	260.9	320.9	316.0	4.9	32	WS406024T	TKY25T	WPT4405	MK1KS	27.0	**TAWNH2700T**	●	
														TAWKH2700TG		★
3	**TAWSN2800S32**	★	102.2	125.2	185.2	180.2	5.0	32	WS508026T	TKY27T	WPT4405	MK1KS	27.5	**TAWNH2750T**	●	
5	**TAWMN2800S32**	★	162.3	185.3	245.3	240.2	5.1	32	WS508026T	TKY27T	WPT4405	MK1KS		**TAWKH2750TG**		★
8	**TAWLN2800S32**	★	239.1	269.1	329.1	324.0	5.1	32	WS508026T	TKY27T	WPT4405	MK1KS	28.0	**TAWNH2800T**	●	
														TAWKH2800TG		★
3	**TAWSN2900S32**	★	105.4	130.4	190.4	185.2	5.2	32	WS508027T	TKY27T	WPT4405	MK1KS	28.5	**TAWNH2850T**	●	
5	**TAWMN2900S32**	★	167.4	190.4	250.4	245.2	5.2	32	WS508027T	TKY27T	WPT4405	MK1KS		**TAWKH2850TG**		★
8	**TAWLN2900S32**	★	247.3	277.3	337.3	332.0	5.3	32	WS508027T	TKY27T	WPT4405	MK1KS	29.0	**TAWNH2900T**	●	
														TAWKH2900TG		★
3	**TAWSN3000S32**	★	109.6	130.6	190.6	185.2	5.4	32	WS508027T	TKY27T	WPT4405	MK1KS	29.5	**TAWNH2950T**	●	
5	**TAWMN3000S32**	★	172.6	200.6	260.6	255.2	5.4	32	WS508027T	TKY27T	WPT4405	MK1KS		**TAWKH2950TG**		★
8	**TAWLN3000S32**	★	255.5	290.5	350.5	345.0	5.5	32	WS508027T	TKY27T	WPT4405	MK1KS	30.0	**TAWNH3000T**	●	
														TAWKH3000TG		★

* Clamp Torque (lbf-in) : WS355521T=49, WS406023T=75, WS406024T=75, WS508026T=110, WS508027T=110

(Note) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).
The LF, LH and LU dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the LF, LH and LU dimensions will be slightly reduced.

DRILLING

INSERTS ➤ L211
CUTTING CONDITIONS ➤ L210
HOW TO USE ➤ L210
TECHNICAL DATA ➤ N001

TAW

RECOMMENDED CUTTING CONDITIONS

Work Material		DC	ϕ.5625"—ϕ.6094" ϕ14.0—ϕ15.4mm		ϕ.6250"—ϕ.7188" ϕ15.5—ϕ18.4mm		ϕ.7344"—ϕ.8438" ϕ18.5—ϕ21.4mm	
		Conditions / Hardness	Cutting Speed (SFM)	Feed (inch/rev)	Cutting Speed (SFM)	Feed (inch/rev)	Cutting Speed (SFM)	Feed (inch/rev)
P	Mild Steel	≤180HB	230 (195—295)	.008 (.006—.010)	260 (195—330)	.010 (.008—.012)	295 (230—360)	.010 (.008—.012)
P	Carbon Steel Alloy Steel	180—280HB	230 (195—295)	.008 (.006—.010)	260 (195—330)	.010 (.008—.012)	260 (195—330)	.010 (.008—.012)
P	Carbon Steel Alloy Steel	280—350HB	195 (165—260)	.006 (.005—.007)	230 (165—295)	.008 (.006—.010)	230 (165—295)	.008 (.006—.010)
M	Stainless Steel	≤200HB	165 (130—195)	.006 (.005—.007)	165 (130—195)	.006 (.005—.007)	195 (165—230)	.008 (.006—.009)
K	Gray Cast Iron	Tensile Strength ≤350MPa	230 (165—295)	.008 (.006—.010)	330 (195—395)	.010 (.008—.012)	390 (195—460)	.010 (.008—.012)
K	Ductile Cast Iron	Tensile Strength ≤450MPa	230 (165—295)	.008 (.006—.010)	260 (195—295)	.010 (.008—.012)	260 (195—295)	.010 (.008—.012)

Work Material		DC	ϕ.8594"—ϕ.9531" ϕ21.5—ϕ24.4mm		ϕ.9688"—ϕ1.0781" ϕ24.5—ϕ27.4mm		ϕ1.0938"—ϕ1.1875" ϕ27.5—ϕ30.4mm	
		Conditions / Hardness	Cutting Speed (SFM)	Feed (inch/rev)	Cutting Speed (SFM)	Feed (inch/rev)	Cutting Speed (SFM)	Feed (inch/rev)
P	Mild Steel	≤180HB	330 (260—390)	.012 (.010—.014)	360 (260—390)	.012 (.010—.014)	360 (260—390)	.012 (.010—.014)
P	Carbon Steel Alloy Steel	180—280HB	295 (230—360)	.012 (.010—.014)	330 (260—390)	.012 (.010—.014)	330 (260—390)	.012 (.010—.014)
P	Carbon Steel Alloy Steel	280—350HB	260 (195—330)	.010 (.008—.012)	295 (230—360)	.010 (.008—.012)	295 (230—360)	.010 (.008—.012)
M	Stainless Steel	≤200HB	195 (165—230)	.008 (.006—.009)	230 (195—260)	.010 (.008—.011)	230 (195—260)	.010 (.008—.011)
K	Gray Cast Iron	Tensile Strength ≤350MPa	425 (260—490)	.014 (.010—.016)	460 (295—525)	.014 (.010—.016)	460 (295—525)	.016 (.012—.018)
K	Ductile Cast Iron	Tensile Strength ≤450MPa	295 (195—330)	.012 (.010—.014)	330 (260—360)	.012 (.010—.014)	330 (260—360)	.012 (.010—.014)

NOTES ON USE

INSERT INSTALLATION

- Loosen insert screw of holder to install insert.
- Mesh the insert serration to holder grooves.
- Fasten the insert screw using the provided wrench while holding rake face of the insert lightly with your thumb. (Figure 1)
- Check that there is no clearance between the insert bottom and holder flute end. (Figure 2)

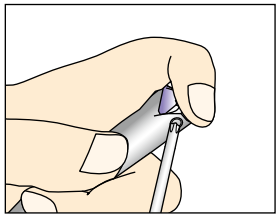


Figure 1

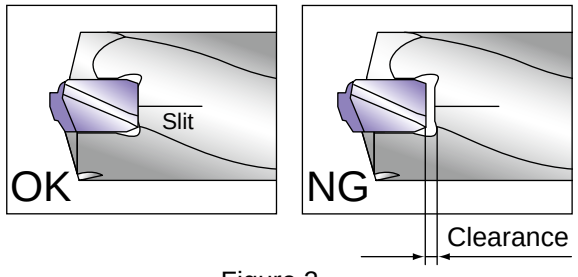


Figure 2

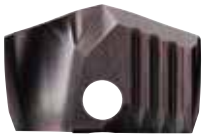
NOTE ON INSERT REPLACEMENT

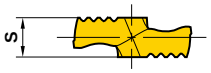
- Clean insert guide grooves by blowing air before installing a new insert.
- Clean the “slit” underneath the insert on the holder with the provided plate.
- Use the provided anti-seize lubricant for lubricating the threads of the insert screw.

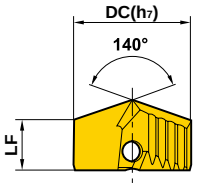
INSERTS

INCH STANDARD

Geometry	Order Number	Stock	Dimensions (inch)			Applicable Holder	
		VP15TF	DC	LF	S	Inch	Metric
For General Use	**TAWNH0036T**	●	.5625	.299	.197	TAWS/M/LNH0036	TAWS/M/LNH1400S16
	TAWNH**0037T**	●	.5781	.295	.197	TAWS/M/LNH0037	TAWS/M/LNH1500S20
	TAWNH**0038T**	●	.5938	.291	.197	TAWS/M/LNH0039	
	TAWNH**0039T**	●	.6094	.291	.197		
	TAWNH**0040T**	●	.6250	.311	.236	TAWS/M/LN0041	TAWS/M/LN1600S20
	TAWNH**0041T**	●	.6406	.307	.236		
	TAWNH**0042T**	●	.6563	.303	.236	TAWS/M/LN0044	TAWS/M/LN1700S20
	TAWNH**0043T**	●	.6719	.299	.236		
	TAWNH**0044T**	●	.6875	.299	.236		
	TAWNH**0045T**	●	.7031	.295	.236	TAWS/M/LN0045	TAWS/M/LN1800S20
	TAWNH**0046T**	●	.7188	.291	.236	TAWS/M/LN0046	
	TAWNH**0047T**	●	.7344	.366	.276	TAWS/M/LN0049	TAWS/M/LN1900S25
	TAWNH**0048T**	●	.7500	.362	.276		
	TAWNH**0049T**	●	.7656	.362	.276		
	TAWNH**0050T**	●	.7813	.358	.276	TAWS/M/LN0051	TAWS/M/LN2000S25
	TAWNH**0051T**	●	.7969	.354	.276		
	TAWNH**0052T**	●	.8125	.350	.276	TAWS/M/LN0054	TAWS/M/LN2100S25
	TAWNH**0053T**	●	.8281	.346	.276		
	TAWNH**0054T**	●	.8438	.346	.276		
	TAWNH**0055T**	●	.8594	.417	.315	TAWS/M/LN0056	TAWS/M/LN2200S25
	TAWNH**0056T**	●	.8750	.413	.315		
	TAWNH**0057T**	●	.8906	.409	.315	TAWS/M/LN0059	TAWS/M/LN2300S25
	TAWNH**0058T**	●	.9063	.406	.315		
	TAWNH**0059T**	●	.9219	.406	.315		
	TAWNH**0060T**	●	.9375	.402	.315	TAWS/M/LN0061	TAWS/M/LN2400S32
	TAWNH**0061T**	●	.9531	.398	.315		
	TAWNH**0062T**	●	.9688	.461	.354	TAWS/M/LN0100	TAWS/M/LN2500S32
	TAWNH**0063T**	●	.9844	.457	.354		
	TAWNH**0100T**	●	1.0000	.457	.354		
	TAWNH**0101T**	●	1.0156	.453	.354	TAWS/M/LN0102	TAWS/M/LN2600S32
	TAWNH**0102T**	●	1.0313	.449	.354		
	TAWNH**0103T**	●	1.0469	.445	.354	TAWS/M/LN0105	TAWS/M/LN2700S32
	TAWNH**0104T**	●	1.0625	.445	.354		
	TAWNH**0105T**	●	1.0781	.441	.354		
	TAWNH**0106T**	●	1.0938	.484	.394	TAWS/M/LN0107	TAWS/M/LN2800S32
	TAWNH**0107T**	●	1.1094	.480	.394		
	TAWNH**0108T**	●	1.1250	.476	.394	TAWS/M/LN0110	TAWS/M/LN2900S32
	TAWNH**0109T**	●	1.1406	.476	.394		
	TAWNH**0110T**	●	1.1563	.472	.394		
	TAWNH**0111T**	●	1.1719	.469	.394	TAWS/M/LN0112	TAWS/M/LN3000S32
	TAWNH**0112T**	●	1.1875	.465	.394		







DRILLING

● : Inventory maintained.

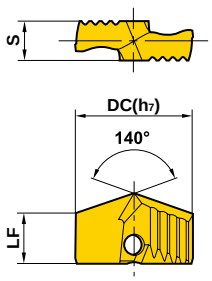
TAW

INSERTS

METRIC STANDARD

Geometry	Order Number	Stock	Dimensions (mm)			Applicable Holder	
		VP15TF	DC	LF	S	Inch	Metric
For General Use	**TAWNH1400T**	▲	14.0	7.6	5.0		
	TAWNH**1410T**	▲	14.1	7.6	5.0	TAWSNH0036	TAWSNH1400S16
	TAWNH**1420T**	▲	14.2	7.6	5.0	TAWMNH0036	TAWMNH1400S16
	TAWNH**1430T**	▲	14.3	7.6	5.0	TAWLNH0036	TAWLNH1400S16
	TAWNH**1440T**	▲	14.4	7.6	5.0		
	TAWNH**1450T**	▲	14.5	7.5	5.0		
	TAWNH**1460T**	▲	14.6	7.5	5.0		
	TAWNH**1470T**	▲	14.7	7.5	5.0	TAWSNH0037	
	TAWNH**1480T**	▲	14.8	7.5	5.0	TAWMNH0037	
	TAWNH**1490T**	▲	14.9	7.5	5.0	TAWLNH0037	TAWSNH1500S20
	TAWNH**1500T**	▲	15.0	7.4	5.0	TAWSNH0039	TAWMNH1500S20
	TAWNH**1510T**	▲	15.1	7.4	5.0	TAWMNH0039	TAWLNH1500S20
	TAWNH**1520T**	▲	15.2	7.4	5.0	TAWLNH0039	
	TAWNH**1530T**	▲	15.3	7.4	5.0		
	TAWNH**1540T**	▲	15.4	7.4	5.0		
	TAWNH**1550T**	▲	15.5	7.9	6.0		
	TAWNH**1560T**	▲	15.6	7.9	6.0		
	TAWNH**1570T**	▲	15.7	7.9	6.0		
	TAWNH**1580T**	▲	15.8	7.9	6.0	TAWSN0041	TAWSN1600S20
	TAWNH**1590T**	▲	15.9	7.9	6.0	TAWMN0041	TAWMN1600S20
	TAWNH**1600T**	▲	16.0	7.8	6.0	TAWLN0041	TAWLN1600S20
	TAWNH**1610T**	▲	16.1	7.8	6.0		
	TAWNH**1620T**	▲	16.2	7.8	6.0		
	TAWNH**1630T**	▲	16.3	7.8	6.0		
	TAWNH**1640T**	▲	16.4	7.8	6.0		
	TAWNH**1650T**	▲	16.5	7.7	6.0		
	TAWNH**1660T**	▲	16.6	7.7	6.0		
	TAWNH**1670T**	▲	16.7	7.7	6.0		
	TAWNH**1680T**	▲	16.8	7.7	6.0		
	TAWNH**1690T**	▲	16.9	7.7	6.0	TAWSN0044	TAWSN1700S20
	TAWNH**1700T**	▲	17.0	7.6	6.0	TAWMN0044	TAWMN1700S20
	TAWNH**1710T**	▲	17.1	7.6	6.0	TAWLN0044	TAWLN1700S20
	TAWNH**1720T**	▲	17.2	7.6	6.0		
	TAWNH**1730T**	▲	17.3	7.6	6.0		
	TAWNH**1740T**	▲	17.4	7.6	6.0		
	TAWNH**1750T**	▲	17.5	7.5	6.0		
	TAWNH**1760T**	▲	17.6	7.5	6.0		
	TAWNH**1770T**	▲	17.7	7.5	6.0	TAWSN0045	
	TAWNH**1780T**	▲	17.8	7.5	6.0	TAWMN0045	TAWSN1800S20
	TAWNH**1790T**	▲	17.9	7.5	6.0	TAWLN0045	TAWMN1800S20
	TAWNH**1800T**	▲	18.0	7.4	6.0	TAWSN0046	TAWLN1800S20
	TAWNH**1810T**	▲	18.1	7.4	6.0	TAWMN0046	
	TAWNH**1820T**	▲	18.2	7.4	6.0	TAWLN0046	
	TAWNH**1830T**	▲	18.3	7.4	6.0		
	TAWNH**1840T**	▲	18.4	7.4	6.0		



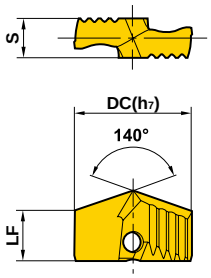


DRILLING

● : Inventory maintained. ▲ : This item to be discontinued within two years.
<One insert in one case>

Geometry	Order Number	Stock	Dimensions (mm)			Applicable Holder	
		VP15TF	DC	LF	S	Inch	Metric
For General Use	**TAWNH1850T**	●	18.5	9.3	7.0	TAWSN0049 TAWMN0049 TAWLN0049	TAWSN1900S25 TAWMN1900S25 TAWLN1900S25
	TAWNH**1860T**	●	18.6	9.3	7.0		
	TAWNH**1870T**	●	18.7	9.3	7.0		
	TAWNH**1880T**	●	18.8	9.3	7.0		
	TAWNH**1890T**	●	18.9	9.3	7.0		
	TAWNH**1900T**	●	19.0	9.2	7.0		
	TAWNH**1910T**	●	19.1	9.2	7.0		
	TAWNH**1920T**	●	19.2	9.2	7.0		
	TAWNH**1930T**	●	19.3	9.2	7.0		
	TAWNH**1940T**	●	19.4	9.2	7.0		
	TAWNH**1950T**	●	19.5	9.1	7.0	TAWSN0051 TAWMN0051 TAWLN0051	TAWSN2000S25 TAWMN2000S25 TAWLN2000S25
	TAWNH**1960T**	●	19.6	9.1	7.0		
	TAWNH**1970T**	●	19.7	9.1	7.0		
	TAWNH**1980T**	●	19.8	9.1	7.0		
	TAWNH**1990T**	●	19.9	9.1	7.0		
	TAWNH**2000T**	●	20.0	9.0	7.0		
	TAWNH**2050T**	●	20.5	8.9	7.0	TAWSN0054 TAWMN0054 TAWLN0054	TAWSN2100S25 TAWMN2100S25 TAWLN2100S25
	TAWNH**2100T**	●	21.0	8.8	7.0		
	TAWNH**2150T**	●	21.5	10.6	8.0	TAWSN0056 TAWMN0056 TAWLN0056	TAWSN2200S25 TAWMN2200S25 TAWLN2200S25
	TAWNH**2200T**	●	22.0	10.5	8.0		
	TAWNH**2250T**	●	22.5	10.4	8.0	TAWSN0059 TAWMN0059 TAWLN0059	TAWSN2300S25 TAWMN2300S25 TAWLN2300S25
	TAWNH**2300T**	●	23.0	10.3	8.0		
	TAWNH**2350T**	●	23.5	10.2	8.0	TAWSN0061 TAWMN0061 TAWLN0061	TAWSN2400S32 TAWMN2400S32 TAWLN2400S32
	TAWNH**2400T**	●	24.0	10.1	9.0		
	TAWNH**2450T**	●	24.5	11.7	9.0	TAWSN0100 TAWMN0100 TAWLN0100	TAWSN2500S32 TAWMN2500S32 TAWLN2500S32
	TAWNH**2500T**	●	25.0	11.6	9.0		
	TAWNH**2550T**	●	25.5	11.5	9.0	TAWSN0102 TAWMN0102 TAWLN0102	TAWSN2600S32 TAWMN2600S32 TAWLN2600S32
	TAWNH**2600T**	●	26.0	11.4	9.0		
	TAWNH**2650T**	●	26.5	11.3	9.0	TAWSN0105 TAWMN0105 TAWLN0105	TAWSN2700S32 TAWMN2700S32 TAWLN2700S32
	TAWNH**2700T**	●	27.0	11.2	9.0		
	TAWNH**2750T**	●	27.5	12.3	10.0	TAWSN0107 TAWMN0107 TAWLN0107	TAWSN2800S32 TAWMN2800S32 TAWLN2800S32
	TAWNH**2800T**	●	28.0	12.2	10.0		
	TAWNH**2850T**	●	28.5	12.1	10.0	TAWSN0110 TAWMN0110 TAWLN0110	TAWSN2900S32 TAWMN2900S32 TAWLN2900S32
	TAWNH**2900T**	●	29.0	12.0	10.0		
	TAWNH**2950T**	●	29.5	11.9	10.0	TAWSN0112 TAWMN0112 TAWLN0112	TAWSN3000S32 TAWMN3000S32 TAWLN3000S32
	TAWNH**3000T**	●	30.0	11.8	10.0		





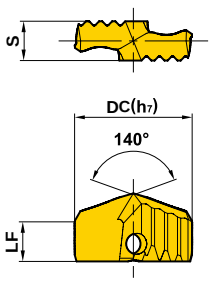
TAW

INSERTS

METRIC STANDARD

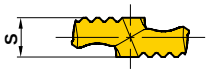
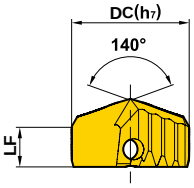
Geometry	Order Number	Stock	Dimensions (mm)			Applicable Holder	
		DP5010	DC	LF	S	Inch	Metric
For Cast Iron	**TAWKH1400TG**	▲	14.0	7.1	5.0		
	TAWKH**1410TG**	▲	14.1	7.1	5.0	TAWSNH0036	TAWSNH1400S16
	TAWKH**1420TG**	▲	14.2	7.1	5.0	TAWMNH0036	TAWMNH1400S16
	TAWKH**1430TG**	▲	14.3	7.1	5.0	TAWLNH0036	TAWLNH1400S16
	TAWKH**1440TG**	▲	14.4	7.1	5.0		
	TAWKH**1450TG**	▲	14.5	7.0	5.0		
	TAWKH**1460TG**	▲	14.6	7.0	5.0		
	TAWKH**1470TG**	▲	14.7	7.0	5.0	TAWSNH0037	
	TAWKH**1480TG**	▲	14.8	7.0	5.0	TAWMNH0037	
	TAWKH**1490TG**	▲	14.9	7.0	5.0	TAWLNH0037	TAWSNH1500S20
	TAWKH**1500TG**	▲	15.0	6.9	5.0	TAWSNH0039	TAWMNH1500S20
	TAWKH**1510TG**	▲	15.1	6.9	5.0	TAWMNH0039	TAWLNH1500S20
	TAWKH**1520TG**	▲	15.2	6.9	5.0	TAWLNH0039	
	TAWKH**1530TG**	▲	15.3	6.9	5.0		
	TAWKH**1540TG**	▲	15.4	6.9	5.0		
	TAWKH**1550TG**	▲	15.5	7.3	6.0		
	TAWKH**1560TG**	▲	15.6	7.3	6.0		
	TAWKH**1570TG**	▲	15.7	7.3	6.0		
	TAWKH**1580TG**	▲	15.8	7.3	6.0		
	TAWKH**1590TG**	▲	15.9	7.3	6.0	TAWSN0041	TAWSN1600S20
	TAWKH**1600TG**	▲	16.0	7.2	6.0	TAWMN0041	TAWMN1600S20
	TAWKH**1610TG**	▲	16.1	7.2	6.0	TAWLN0041	TAWLN1600S20
	TAWKH**1620TG**	▲	16.2	7.2	6.0		
	TAWKH**1630TG**	▲	16.3	7.2	6.0		
	TAWKH**1640TG**	▲	16.4	7.2	6.0		
	TAWKH**1650TG**	▲	16.5	7.1	6.0		
	TAWKH**1660TG**	▲	16.6	7.1	6.0		
	TAWKH**1670TG**	▲	16.7	7.1	6.0		
	TAWKH**1680TG**	▲	16.8	7.1	6.0		
	TAWKH**1690TG**	▲	16.9	7.1	6.0	TAWSN0044	TAWSN1700S20
	TAWKH**1700TG**	▲	17.0	7.0	6.0	TAWMN0044	TAWMN1700S20
	TAWKH**1710TG**	▲	17.1	7.0	6.0	TAWLN0044	TAWLN1700S20
	TAWKH**1720TG**	▲	17.2	7.0	6.0		
	TAWKH**1730TG**	▲	17.3	7.0	6.0		
	TAWKH**1740TG**	▲	17.4	7.0	6.0		
	TAWKH**1750TG**	▲	17.5	6.8	6.0		
	TAWKH**1760TG**	▲	17.6	6.8	6.0		
	TAWKH**1770TG**	▲	17.7	6.8	6.0	TAWSN0045	
	TAWKH**1780TG**	▲	17.8	6.8	6.0	TAWMN0045	
	TAWKH**1790TG**	▲	17.9	6.8	6.0	TAWLN0045	TAWSN1800S20
	TAWKH**1800TG**	▲	18.0	6.8	6.0	TAWSN0046	TAWMN1800S20
	TAWKH**1810TG**	▲	18.1	6.8	6.0	TAWMN0046	TAWLN1800S20
	TAWKH**1820TG**	▲	18.2	6.8	6.0	TAWLN0046	
	TAWKH**1830TG**	▲	18.3	6.8	6.0		
	TAWKH**1840TG**	▲	18.4	6.8	6.0		





DRILLING

★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.

Geometry	Order Number	Stock	Dimensions (mm)			Applicable Holder	
		DP5010	DC	LF	S	Inch	Metric
For Cast Iron	**TAWKH1850TG**	★	18.5	8.6	7.0		
	TAWKH**1860TG**	★	18.6	8.6	7.0		
	TAWKH**1870TG**	★	18.7	8.6	7.0		
	TAWKH**1880TG**	★	18.8	8.6	7.0		
	TAWKH**1890TG**	★	18.9	8.6	7.0	TAWSN0049 TAWMN0049	TAWSN1900S25 TAWMN1900S25
	TAWKH**1900TG**	★	19.0	8.5	7.0	TAWLN0049	TAWLN1900S25
	TAWKH**1910TG**	★	19.1	8.5	7.0		
	TAWKH**1920TG**	★	19.2	8.5	7.0		
	TAWKH**1930TG**	★	19.3	8.5	7.0		
	TAWKH**1940TG**	★	19.4	8.5	7.0		
	TAWKH**1950TG**	★	19.5	8.4	7.0		
	TAWKH**1960TG**	★	19.6	8.4	7.0		
	TAWKH**1970TG**	★	19.7	8.4	7.0	TAWSN0051 TAWMN0051	TAWSN2000S25 TAWMN2000S25
	TAWKH**1980TG**	★	19.8	8.4	7.0	TAWLN0051	TAWLN2000S25
	TAWKH**1990TG**	★	19.9	8.4	7.0		
	TAWKH**2000TG**	★	20.0	8.3	7.0		
	TAWKH**2050TG**	★	20.5	8.2	7.0	TAWSN0054 TAWMN0054 TAWLN0054	TAWSN2100S25 TAWMN2100S25 TAWLN2100S25
	TAWKH**2100TG**	★	21.0	8.1	7.0		
	TAWKH**2150TG**	★	21.5	9.8	8.0	TAWSN0056 TAWMN0056 TAWLN0056	TAWSN2200S25 TAWMN2200S25 TAWLN2200S25
	TAWKH**2200TG**	★	22.0	9.7	8.0		
	TAWKH**2250TG**	★	22.5	9.6	8.0	TAWSN0059 TAWMN0059 TAWLN0059	TAWSN2300S25 TAWMN2300S25 TAWLN2300S25
	TAWKH**2300TG**	★	23.0	9.5	8.0		
	TAWKH**2350TG**	★	23.5	9.4	8.0	TAWSN0061 TAWMN0061 TAWLN0061	TAWSN2400S32 TAWMN2400S32 TAWLN2400S32
	TAWKH**2400TG**	★	24.0	9.3	9.0		
	TAWKH**2450TG**	★	24.5	10.8	9.0	TAWSN0100 TAWMN0100 TAWLN0100	TAWSN2500S32 TAWMN2500S32 TAWLN2500S32
	TAWKH**2500TG**	★	25.0	10.7	9.0		
	TAWKH**2550TG**	★	25.5	10.6	9.0	TAWSN0102 TAWMN0102 TAWLN0102	TAWSN2600S32 TAWMN2600S32 TAWLN2600S32
	TAWKH**2600TG**	★	26.0	10.5	9.0		
	TAWKH**2650TG**	★	26.5	10.4	9.0	TAWSN0105 TAWMN0105 TAWLN0105	TAWSN2700S32 TAWMN2700S32 TAWLN2700S32
	TAWKH**2700TG**	★	27.0	10.3	9.0		
	TAWKH**2750TG**	★	27.5	11.3	10.0	TAWSN0107 TAWMN0107 TAWLN0107	TAWSN2800S32 TAWMN2800S32 TAWLN2800S32
	TAWKH**2800TG**	★	28.0	11.2	10.0		
	TAWKH**2850TG**	★	28.5	11.1	10.0	TAWSN0110 TAWMN0110 TAWLN0110	TAWSN2900S32 TAWMN2900S32 TAWLN2900S32
	TAWKH**2900TG**	★	29.0	11.0	10.0		
	TAWKH**2950TG**	★	29.5	10.9	10.0	TAWSN0112 TAWMN0112 TAWLN0112	TAWSN3000S32 TAWMN3000S32 TAWLN3000S32
	TAWKH**3000TG**	★	30.0	10.8	10.0		

BRA
NEW POINT DRILL

- Low thrust due to absence of a chisel edge.
- Easy regrinding.

P | M | K | N | S | H

.3125"≤DC≤.3906"	.4063"≤DC≤.7031"	.7188"≤DC≤1.1719"	1.1875"≤DC≤1.2500"
8≤DC≤10mm	10<DC≤18mm	18<DC≤30mm	
$^{0}_{-.00059}$	$^{0}_{-.00071}$	$^{0}_{-.00083}$	$^{0}_{-.00098}$

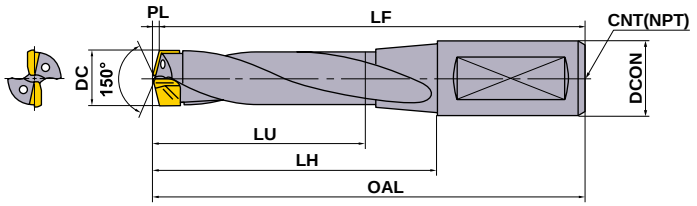
(inch)

General Use (Carbon Steel, Alloy Steel, Stainless Steel)

L/D=3

Internal Coolant





INCH STANDARD

Helix Angle : 20°

Order Number	Stock	Dimensions (inch)							
	UP20M	DC	LU	LH	OAL	LF	PL	DCON	CNT
BRA0020	●	.3125	.901	1.417	3.292	3.250	.042	.625	1/8
BRA0021	●	.3281	.903	1.419	3.294	3.250	.044	.625	1/8
BRA0022	●	.3438	1.095	1.624	3.952	3.906	.046	.625	1/8
BRA0023	●	.3594	1.097	1.626	3.954	3.906	.048	.625	1/8
BRA0024	●	.3750	1.362	1.815	3.690	3.640	.050	.625	1/8
BRA0025	●	.3906	1.364	1.817	3.692	3.640	.052	.625	1/8
BRA0026	●	.4063	1.366	1.819	3.694	3.640	.054	.625	1/8
BRA0027	●	.4219	1.525	2.025	3.900	3.843	.057	.625	1/8
BRA0028	●	.4375	1.527	2.027	3.902	3.843	.059	.625	1/8
BRA0029	●	.4531	2.045	2.592	4.467	4.406	.061	.625	1/8
BRA0030	●	.4688	2.047	2.594	4.469	4.406	.063	.625	1/8
BRA0031	●	.4844	2.049	2.596	4.471	4.406	.065	.625	1/8
BRA0032	●	.5000	2.207	2.801	4.676	4.609	.067	.625	1/8
BRA0033	●	.5156	2.209	2.803	4.678	4.609	.069	.625	1/8
BRA0034	●	.5313	2.211	2.805	4.680	4.609	.071	.625	1/8
BRA0035	●	.5469	2.370	3.010	4.885	4.812	.073	.625	1/8
BRA0036	●	.5625	2.372	3.012	4.887	4.812	.075	.625	1/8
BRA0037	●	.5781	2.531	3.218	5.093	5.015	.078	.625	1/8
BRA0038	●	.5938	2.533	3.220	5.220	5.140	.080	.750	1/8
BRA0039	●	.6094	2.535	3.222	5.222	5.140	.082	.750	1/8
BRA0040	●	.6250	2.693	3.412	5.412	5.328	.084	.750	1/8
BRA0041	●	.6406	2.695	3.414	5.414	5.328	.086	.750	1/8
BRA0042	●	.6563	2.853	3.634	5.634	5.546	.088	.750	1/8
BRA0043	●	.6719	2.855	3.636	5.636	5.546	.090	.750	1/8
BRA0044	●	.6875	2.857	3.638	5.638	5.546	.092	.750	1/8
BRA0045	●	.7031	3.015	3.828	5.828	5.734	.094	.750	1/8
BRA0046	●	.7188	3.018	3.831	6.081	5.984	.097	1.000	1/8
BRA0047	●	.7344	3.207	4.051	6.301	6.203	.098	1.000	1/8
BRA0048	●	.7500	3.209	4.053	6.303	6.203	.100	1.000	1/8
BRA0049	●	.7656	3.212	4.056	6.306	6.203	.103	1.000	1/8
BRA0050	●	.7813	3.370	4.245	6.495	6.390	.105	1.000	1/8

Order Number	Stock	Dimensions (inch)							
	UP20M	DC	LU	LH	OAL	LF	PL	DCON	CNT
BRA0051	●	.7969	3.372	4.247	6.497	6.390	.107	1.000	1/8
BRA0052	●	.8125	3.530	4.468	6.718	6.609	.109	1.000	1/8
BRA0053	●	.8281	3.532	4.470	6.720	6.609	.111	1.000	1/8
BRA0054	●	.8438	3.534	4.472	6.722	6.609	.113	1.000	1/8
BRA0055	●	.8594	3.693	4.661	6.884	6.769	.115	1.000	1/8
BRA0056	●	.8750	3.695	4.663	6.886	6.769	.117	1.000	1/8
BRA0057	●	.8906	3.853	4.884	7.134	7.015	.119	1.000	1/8
BRA0058	●	.9063	3.855	4.886	7.136	7.015	.121	1.000	1/8
BRA0059	●	.9219	3.858	4.889	7.139	7.015	.124	1.000	1/8
BRA0060	●	.9375	4.016	5.079	7.454	7.328	.126	1.250	1/4
BRA0061	●	.9531	4.018	5.081	7.456	7.328	.128	1.250	1/4
BRA0062	●	.9688	4.176	5.301	7.676	7.546	.130	1.250	1/4
BRA0063	●	.9844	4.178	5.303	7.678	7.546	.132	1.250	1/4
BRA0100	●	1.0000	4.180	5.305	7.680	7.546	.134	1.250	1/4
BRA0101	●	1.0156	4.182	5.495	7.870	7.734	.136	1.250	1/4
BRA0102	●	1.0313	4.341	5.497	7.872	7.734	.138	1.250	1/4
BRA0103	●	1.0469	4.499	5.718	8.093	7.953	.140	1.250	1/4
BRA0104	●	1.0625	4.502	5.721	8.096	7.953	.143	1.250	1/4
BRA0105	●	1.0781	4.504	5.723	8.098	7.953	.145	1.250	1/4
BRA0106	●	1.0938	4.662	5.912	8.287	8.140	.147	1.250	1/4
BRA0107	●	1.1094	4.664	5.914	8.289	8.140	.149	1.250	1/4
BRA0108	●	1.1250	4.822	6.135	8.510	8.359	.151	1.250	1/4
BRA0109	●	1.1406	4.824	6.137	8.512	8.359	.153	1.250	1/4
BRA0110	●	1.1563	4.826	6.139	8.514	8.359	.155	1.250	1/4
BRA0111	●	1.1719	4.985	6.329	8.703	8.546	.157	1.250	1/4
BRA0112	●	1.1875	4.987	6.331	8.705	8.546	.159	1.250	1/4
BRA0113	□	1.2031	5.161	6.942	9.301	9.140	.161	1.500	1/4
BRA0114	□	1.2188	5.163	6.944	9.303	9.140	.163	1.500	1/4
BRA0115	□	1.2344	5.165	6.946	9.305	9.140	.165	1.500	1/4
BRA0116	□	1.2500	5.339	6.776	9.526	9.359	.167	1.500	1/4

● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.

METRIC STANDARD

Order Number	Stock	Dimensions (mm)						
	UP20M	DC	LU	LH	OAL	LF	PL	DCON
BRA0800S16	★	8.0	24.1	36.1	84.1	83	1.1	16
BRA0850S16	★	8.5	24.1	36.1	84.1	83	1.1	16
BRA0900S16	★	9.0	29.2	41.2	89.2	88	1.2	16
BRA0950S16	★	9.5	29.3	41.3	89.3	88	1.3	16
BRA1000S16	★	10.0	36.3	46.3	94.3	93	1.3	16
BRA1050S16	★	10.5	36.4	46.4	94.4	93	1.4	16
BRA1100S16	★	11.0	41.5	52.5	100.5	99	1.5	16
BRA1150S16	★	11.5	41.5	52.5	100.5	99	1.5	16
BRA1200S16	★	12.0	45.6	57.6	105.6	104	1.6	16
BRA1250S16	★	12.5	45.7	57.7	105.7	104	1.7	16
BRA1300S16	★	13.0	49.7	62.7	110.7	109	1.7	16
BRA1350S16	★	13.5	49.8	62.8	110.8	109	1.8	16
BRA1400S16	★	14.0	53.9	67.9	115.9	114	1.9	16
BRA1450S16	★	14.5	53.9	67.9	115.9	114	1.9	16
BRA1500S20	★	15.0	63.0	78.0	128.0	126	2.0	20
BRA1550S20	★	15.5	63.1	78.1	128.1	126	2.1	20
BRA1600S20	★	16.0	67.1	83.1	133.1	131	2.1	20
BRA1650S20	★	16.5	67.2	83.2	133.2	131	2.2	20
BRA1700S20	★	17.0	71.3	88.3	138.3	136	2.3	20
BRA1750S20	★	17.5	71.3	88.3	138.3	136	2.3	20
BRA1800S20	★	18.0	75.4	93.4	143.4	141	2.4	20
BRA1850S20	★	18.5	75.5	93.5	143.5	141	2.5	20
BRA1900S25	★	19.0	79.5	103.5	159.5	157	2.5	25

Order Number	Stock	Dimensions (mm)						
	UP20M	DC	LU	LH	OAL	LF	PL	DCON
BRA1950S25	★	19.5	79.6	103.6	159.6	157	2.6	25
BRA2000S25	★	20.0	83.7	103.7	159.7	157	2.7	25
BRA2050S25	★	20.5	83.7	103.7	159.7	157	2.7	25
BRA2100S25	★	21.0	82.8	103.8	159.8	157	2.8	25
BRA2150S25	★	21.5	82.9	103.9	159.9	157	2.9	25
BRA2200S25	★	22.0	86.9	108.9	164.9	162	2.9	25
BRA2250S25	★	22.5	87.0	109.0	165.0	162	3.0	25
BRA2300S25	★	23.0	86.1	109.1	165.1	162	3.1	25
BRA2350S25	★	23.5	86.1	109.1	165.1	162	3.1	25
BRA2400S32	★	24.0	90.2	114.2	174.2	171	3.2	32
BRA2450S32	★	24.5	90.3	114.3	174.3	171	3.3	32
BRA2500S32	★	25.0	89.3	114.3	174.3	171	3.3	32
BRA2550S32	★	25.5	89.4	114.4	174.4	171	3.4	32
BRA2600S32	★	26.0	93.5	119.5	179.5	176	3.5	32
BRA2650S32	★	26.5	93.6	119.6	179.6	176	3.6	32
BRA2700S32	★	27.0	92.6	119.6	179.6	176	3.6	32
BRA2750S32	★	27.5	92.7	119.7	179.7	176	3.7	32
BRA2800S32	★	28.0	96.8	124.8	184.8	181	3.8	32
BRA2850S32	★	28.5	96.8	124.8	184.8	181	3.8	32
BRA2900S32	★	29.0	100.9	129.9	189.9	186	3.9	32
BRA2950S32	★	29.5	101.0	130.0	190.0	186	4.0	32
BRA3000S32	★	30.0	100.0	130.0	190.0	186	4.0	32

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Drill Dia. ϕ.3125" – ϕ.5156" ϕ8.0 – ϕ13.0mm		Drill Dia. ϕ.5313" – ϕ.7031" ϕ13.5 – ϕ18.0mm		Drill Dia. ≥ϕ.7031" ≥ϕ18.5mm	
			Cutting Speed (SFM)	Feed (inch/rev)	Cutting Speed (SFM)	Feed (inch/rev)	Cutting Speed (SFM)	Feed (inch/rev)
P	Mild Steel	≤180HB	180 (130—210)	.010 (.008—.012)	210 (165—245)	.012 (.010—.014)	245 (195—280)	.012 (.010—.014)
P	Carbon Steel Alloy Steel	180—280HB	165 (115—195)	.010 (.008—.012)	195 (145—230)	.012 (.010—.014)	230 (180—260)	.012 (.010—.014)
P	Carbon Steel Alloy Steel	280—350HB	130 (100—165)	.010 (.008—.012)	165 (130—195)	.010 (.008—.012)	180 (145—210)	.011 (.008—.012)
M	Stainless Steel	≤200HB	100 (65—130)	.010 (.008—.011)	115 (80—145)	.011 (.008—.012)	130 (100—165)	.012 (.010—.014)
K	Cast Iron	Tensile Strength ≤350MPa	195 (130—230)	.012 (.010—.014)	230 (165—260)	.014 (.012—.016)	260 (195—295)	.016 (.014—.018)
K	Ductile Cast Iron	Tensile Strength ≤450MPa	180 (130—210)	.011 (.008—.012)	195 (145—230)	.012 (.010—.014)	230 (180—260)	.012 (.010—.014)
S	Heat Resistant Alloy	—	50 (30—65)	.004 (.002—.005)	65 (50—80)	.006 (.004—.008)	80 (65—100)	.006 (.004—.008)
S	Titanium Alloy	—	65 (30—80)	.006 (.004—.007)	100 (65—115)	.008 (.006—.010)	115 (100—130)	.010 (.008—.012)

(Note) Above conditions are for general cutting.
The cutting conditions need to be modified depending on power, rigidity of the machine and workpiece shape.

CUTTING FLUID

- Water-soluble cutting fluid containing large amount of E.P. additives.

REGRINDING PROCEDURES

- **Contact your local Mitsubishi Carbide Representative or Distributor for authorized regrinding facilities information.**

- **Regrinding**

Grind flank by moving table back and forth as shown in Fig. 1-(At the end of grinding, be sure to spark out and maintain lip heights within .001 inch.)

- **Honing**

Honing has great influence on tool life and the accuracy of finished surface.
Be sure to hone the entire length (including radius) of cutting edge at each regrind.
- For honing shape, refer to Fig. 2, Standard hone shape.
- For honing use diamond file produced by Mitsubishi Materials Corp.

Fig. 1

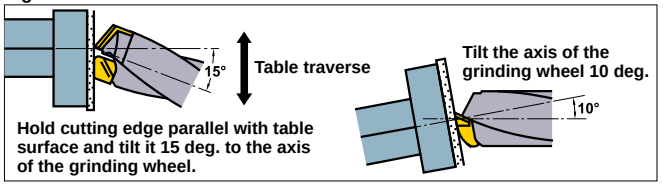
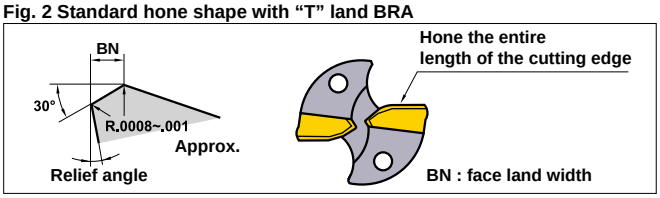


Fig. 2 Standard hone shape with "T" land BRA



Work Material	BN (inch)	Work Material	W (inch)
Mild Steel Carbon Steel Alloy Steel	.006—.008	Stainless steel Titanium alloy	.002—.004
		Cast iron	.001—.003

- **Diamond file** (produced by Mitsubishi Materials Corp.)

Roughing File : T-1-140 (#140)
Finishing File : T-0-400 (#400)
Ultra-Fine Finishing File : T-0-1500 (#1500)

DRILLING

BRS

- Excellent cutting sharpness and chip discharge due to high rake type insert.
- High efficiency, high accuracy machining.
- Suitable for stainless steel and mild steel cutting. Possible for general steel cutting. (l/d=3)

P | M | K | N | S | H

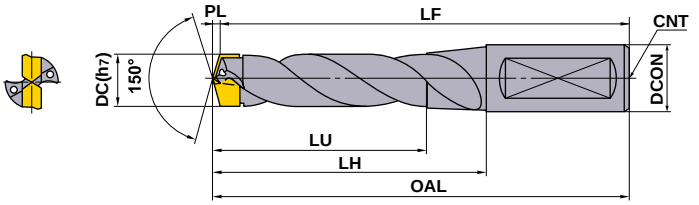
.5000"≤DC≤.7031"	.7188"≤DC≤1.1719"	DC=1.1875"
14<DC≤18mm	18<DC≤30mm	
0 −.00071	0 −.00083	0 −.00098

(inch)

L/D=3

Internal Coolant





Helix Angle : 30°

INCH STANDARD

Order Number	Stock	Dimensions (inch)							
	UP20M	DC	LU	LH	OAL	LF	PL	DCON	CNT
BRS0032	●	.5000	2.207	2.801	4.676	4.609	.067	.625	1/8
BRS0033	●	.5156	2.209	2.803	4.678	4.609	.069	.625	1/8
BRS0034	●	.5313	2.211	2.805	4.680	4.609	.071	.625	1/8
BRS0035	●	.5469	2.370	3.010	4.885	4.812	.073	.625	1/8
BRS0036	●	.5625	2.372	3.012	4.887	4.812	.075	.625	1/8
BRS0037	●	.5781	2.531	3.218	5.093	5.015	.078	.625	1/8
BRS0038	●	.5938	2.533	3.220	5.220	5.140	.080	.750	1/8
BRS0039	●	.6094	2.535	3.222	5.222	5.140	.082	.750	1/8
BRS0040	●	.6250	2.693	3.412	5.412	5.328	.084	.750	1/8
BRS0041	●	.6406	2.695	3.414	5.414	5.328	.086	.750	1/8
BRS0042	●	.6563	2.853	3.634	5.634	5.546	.088	.750	1/8
BRS0043	●	.6719	2.855	3.636	5.636	5.546	.090	.750	1/8
BRS0044	●	.6875	2.857	3.638	5.638	5.546	.092	.750	1/8
BRS0045	●	.7031	3.015	3.828	5.828	5.734	.094	.750	1/8
BRS0046	●	.7188	3.018	3.831	6.081	5.984	.097	1.000	1/8
BRS0047	●	.7344	3.207	4.051	6.301	6.203	.098	1.000	1/8
BRS0048	●	.7500	3.209	4.053	6.303	6.203	.100	1.000	1/8
BRS0049	●	.7656	3.212	4.056	6.306	6.203	.103	1.000	1/8
BRS0050	●	.7813	3.370	4.245	6.495	6.390	.105	1.000	1/8
BRS0051	●	.7969	3.372	4.247	6.497	6.390	.107	1.000	1/8
BRS0052	●	.8125	3.530	4.468	6.718	6.609	.109	1.000	1/8
BRS0053	●	.8281	3.532	4.470	6.720	6.609	.111	1.000	1/8
BRS0054	●	.8438	3.534	4.472	6.722	6.609	.113	1.000	1/8

Order Number	Stock	Dimensions (inch)							
	UP20M	DC	LU	LH	OAL	LF	PL	DCON	CNT
BRS0055	●	.8594	3.693	4.661	6.911	6.796	.115	1.000	1/8
BRS0056	●	.8750	3.695	4.663	6.913	6.796	.117	1.000	1/8
BRS0057	●	.8906	3.853	4.884	7.134	7.015	.119	1.000	1/8
BRS0058	●	.9063	3.855	4.886	7.136	7.015	.121	1.000	1/8
BRS0059	●	.9219	3.858	4.889	7.139	7.015	.124	1.000	1/8
BRS0060	●	.9375	4.016	5.079	7.454	7.328	.126	1.250	1/4
BRS0061	●	.9531	4.018	5.081	7.456	7.328	.128	1.250	1/4
BRS0062	●	.9688	4.176	5.301	7.676	7.546	.130	1.250	1/4
BRS0063	●	.9844	4.178	5.303	7.678	7.546	.132	1.250	1/4
BRS0100	●	1.0000	4.180	5.305	7.680	7.546	.134	1.250	1/4
BRS0101	●	1.0156	4.339	5.495	7.870	7.734	.136	1.250	1/4
BRS0102	●	1.0313	4.341	5.497	7.872	7.734	.138	1.250	1/4
BRS0103	●	1.0469	4.499	5.718	8.093	7.953	.140	1.250	1/4
BRS0104	●	1.0625	4.502	5.721	8.096	7.953	.143	1.250	1/4
BRS0105	●	1.0781	4.504	5.723	8.098	7.953	.145	1.250	1/4
BRS0106	●	1.0938	4.662	5.912	8.287	8.140	.147	1.250	1/4
BRS0107	●	1.1094	4.664	5.914	8.289	8.140	.149	1.250	1/4
BRS0108	●	1.1250	4.822	6.135	8.510	8.359	.151	1.250	1/4
BRS0109	●	1.1406	4.824	6.137	8.512	8.359	.153	1.250	1/4
BRS0110	●	1.1563	4.826	6.139	8.514	8.359	.155	1.250	1/4
BRS0111	●	1.1719	4.985	6.329	8.703	8.546	.157	1.250	1/4
BRS0112	●	1.1875	4.987	6.331	8.705	8.546	.159	1.250	1/4

● : Inventory maintained. ★ : Inventory maintained in Japan.

METRIC STANDARD

Order Number	Stock	Dimensions (mm)						
	UP20M	DC	LU	LH	OAL	LF	PL	DCON
BRS1400S16	★	14.0	53.9	67.9	115.9	114	1.9	16
BRS1450S16	★	14.5	53.9	67.9	115.9	114	1.9	16
BRS1500S20	★	15.0	63.0	78.0	128.0	126	2.0	20
BRS1550S20	★	15.5	63.1	78.1	128.1	126	2.1	20
BRS1600S20	★	16.0	67.1	83.1	133.1	131	2.1	20
BRS1650S20	★	16.5	67.2	83.2	133.2	131	2.2	20
BRS1700S20	★	17.0	71.3	88.3	138.3	136	2.3	20
BRS1750S20	★	17.5	71.3	88.3	138.3	136	2.3	20
BRS1800S20	★	18.0	75.4	93.4	143.4	141	2.4	20
BRS1850S20	★	18.5	75.5	93.5	143.5	141	2.5	20
BRS1900S25	★	19.0	79.5	103.5	159.5	157	2.5	25
BRS1950S25	★	19.5	79.6	103.6	159.6	157	2.6	25
BRS2000S25	★	20.0	83.7	103.7	159.7	157	2.7	25
BRS2050S25	★	20.5	83.7	103.7	159.7	157	2.7	25
BRS2100S25	★	21.0	82.8	103.8	159.8	157	2.8	25
BRS2150S25	★	21.5	82.9	103.9	159.9	157	2.9	25
BRS2200S25	★	22.0	86.9	108.9	164.9	162	2.9	25

Order Number	Stock	Dimensions (mm)						
	UP20M	DC	LU	LH	OAL	LF	PL	DCON
BRS2250S25	★	22.5	87.0	109.0	165.0	162	3.0	25
BRS2300S25	★	23.0	86.1	109.1	165.1	162	3.1	25
BRS2350S25	★	23.5	86.1	109.1	165.1	162	3.1	25
BRS2400S32	★	24.0	90.2	114.2	174.2	171	3.2	32
BRS2450S32	★	24.5	90.3	114.3	174.3	171	3.3	32
BRS2500S32	★	25.0	89.3	114.3	174.3	171	3.3	32
BRS2550S32	★	25.5	89.4	114.4	174.4	171	3.4	32
BRS2600S32	★	26.0	93.5	119.5	179.5	176	3.5	32
BRS2650S32	★	26.5	93.6	119.6	179.6	176	3.6	32
BRS2700S32	★	27.0	92.6	119.6	179.6	176	3.6	32
BRS2750S32	★	27.5	92.7	119.7	179.7	176	3.7	32
BRS2800S32	★	28.0	96.8	124.8	184.8	181	3.8	32
BRS2850S32	★	28.5	96.8	124.8	184.8	181	3.8	32
BRS2900S32	★	29.0	100.9	129.9	189.9	186	3.9	32
BRS2950S32	★	29.5	101.0	130.0	190.0	186	4.0	32
BRS3000S32	★	30.0	100.0	130.0	190.0	186	4.0	32

RECOMMENDED CUTTING CONDITIONS

Work Material		DC	ϕ.5000" – ϕ.7813" ϕ14.0 – ϕ20.0mm		ϕ.7969" – ϕ1.1875" ϕ20.5 – ϕ30.0mm	
		Hardness	Cutting Speed (SFM)	Feed (inch/rev)	Cutting Speed (SFM)	Feed (inch/rev)
P	Mild Steel	≤180HB	210 (165—245)	.012 (.008—.016)	230 (180—280)	.014 (.008—.018)
P	Carbon Steel Alloy Steel	180—280HB	195 (145—230)	.010 (.004—.014)	210 (145—260)	.012 (.006—.014)
P	Carbon Steel Alloy Steel	280—350HB	180 (130—210)	.008 (.006—.014)	195 (145—230)	. 010 (.006—.014)
M	Stainless Steel (Austenitic)	≤200HB	230 (165—295)	.012 (.008—.016)	260 (195—330)	.012 (.008—.016)
K	Gray Cast Iron	Tensile Strength ≤350MPa	245 (195—360)	.012 (.008—.016)	260 (195—330)	.014 (.010—.020)
K	Ductile Cast Iron	Tensile Strength ≤450MPa	245 (195—330)	.012 (.008—.016)	260 (195—330)	.014 (.008—.018)
K	Ductile Cast Iron	Tensile Strength 500—800MPa	230 (180—295)	.010 (.006—.014)	245 (180—295)	.012 (.006—.016)

(Note) Above conditions are for general cutting.
The cutting conditions need to be modified depending on power, rigidity of the machine and workpiece shape.

Memo

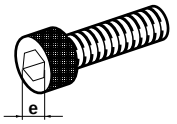
SPARE PARTS

IDENTIFICATION M002
SPARE PARTS
- CLAMP SCREW M003
- SET BOLT M008
- SHIM M009
- SHIM SCREW M012
- PIN/RING/CLAMP LEVER M013
- SPRING M013
- CLAMP BRIDGE M014
- CHIPBREAKER M015
- ANTI SEIZE LUBRICANT M016

IDENTIFICATION

IDENTIFICATION OF CLAMP SCREW (Metric coarse right hand screw thread)

H **SC** **060** **05**



Length

Example	
Symbol	L
05	.197
10	.394
20	.787

Screw Diameter

Example	
Symbol	d
050	M5
060	M6

● **Hexagonal Hole Dimensions**

Diameter (Metric)	Pitch (mm)	e Dimensions			
		HBH	HFC	HSC	HS○
M2	.4	—	—	.059	.035
M2.5	.45	—	—	.079	.051
M3	.5	.079	.079	.098	.059
M4	.7	.098	.098	.118	.079
M5	.8	.118	.118	.157	.098
M6	1.0	.157	.157	.197	.118
M8	1.25	.197	.197	.236	.157
M10	1.5	.236	.236	.315	.197

Screw Head

Symbol	Head	Geometry
BH BHA	Button Head	
FC	Flat Head	
SC	Socket Head	
PM	Pan Head	
FM	Flat Head (Flat Head)	
SD	Set Screw (Cut Point)	
SP	Set Screw (Cone Point)	
SR	Set Screw (Dog Point)	
SS	Set Screw (Flat Point)	

JIS Standard

Hexagonal Hole Dimensions

Symbol	Geometry
H	

With Slot

Symbol	Geometry
S	

With Cross Hole

Symbol	Geometry
C	

IDENTIFICATION OF WRENCH

HKY **15** **R**

Symbol	Wrench
HKY	Hexagonal Wrench
TKY	Torx Wrench
NKY	Torx Wrench
TIP	Torx plus® Wrench

Hexagonal Wrench

Symbol	e
15	.059
20	.079
25	.098
30	.118
35	.138
40	.157
50	.197
60	.236

Torx Wrench

Symbol	e	Size
06	.071	T6
08	.094	T8
10	.110	T10
15	.130	T15
20	.154	T20
25	.177	T25
27	.201	T27
30	.217	T30

Torx plus® Wrench

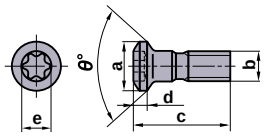
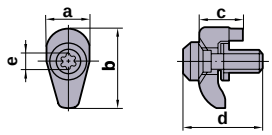
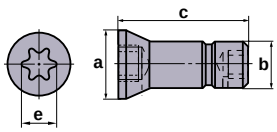
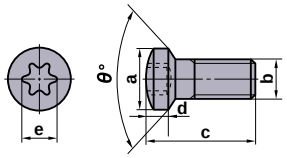
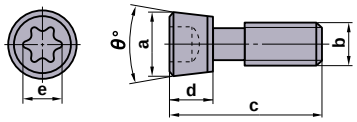
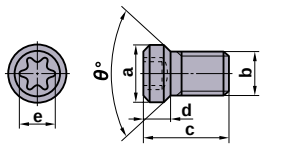
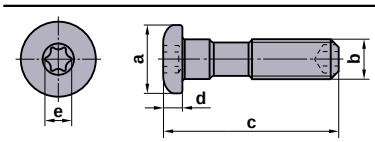
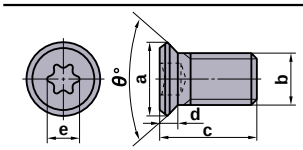
Symbol	e	Size
06	.071	6IP
07	.083	7IP
08	.094	8IP
10	.110	10IP
15	.130	15IP
25	.154	251P

R	Standard L Wrench	
L	Long L Wrench	
T	T Wrench	
F FS	Flag Wrench	
W	Flag Wrench	
D DS	Driver	

Note: Dimension symbols conforming to ISO13399. See pages PR3-PR6 for details.

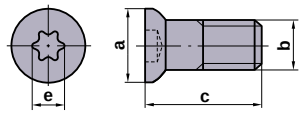
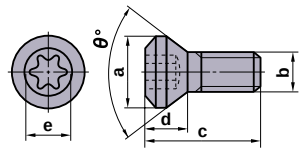
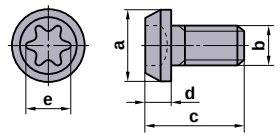
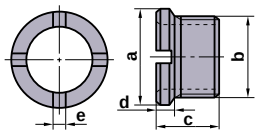
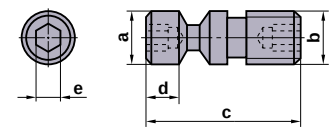
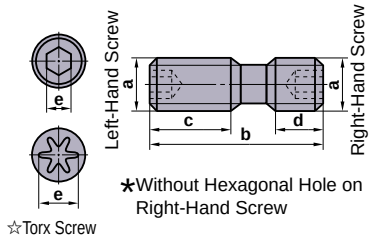
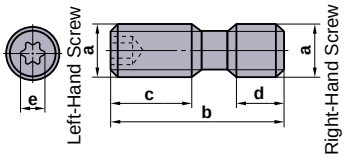
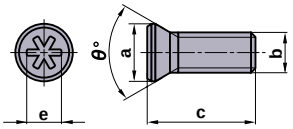
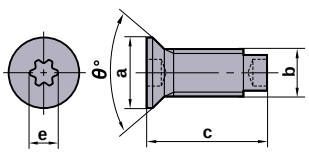
SPARE PARTS

CLAMP SCREW

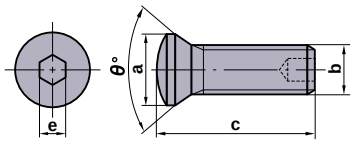
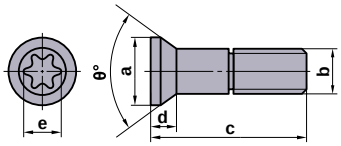
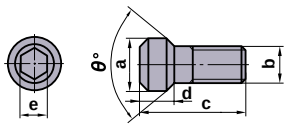
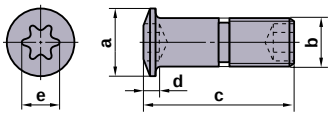
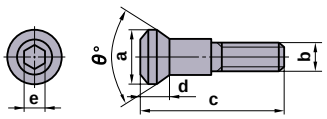
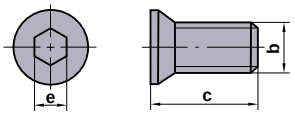
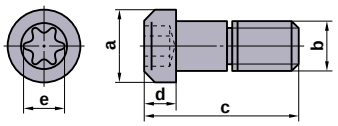
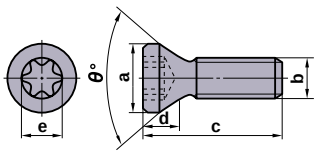
Geometry	Order Number	Dimensions (inch) a	b	c	d	e	θ°	Torque (lbf-in)	Tool Holder
	**AJS3010T10**	.197	M3×0.5	.394	.059	T10	120	22	**DOUBLE CLAMP** Type Holder **AJX** Type Cutter **PMC** Type Cutter
	AJS4012T15	.276	M4×0.7	.472	.087	T15	120	31	
	AJS5014T25	.315	M5×0.8	.551	.106	T25	120	66	
	**BC5**	.354	.717	.335	.669	T20	—	44	**F** Type Boring Bar
	**BLS02**	.165	M3	.270	—	T08	—	18	**MBN** Type **MBD** Type
	BLS03	.235	M4	.335	—	T15	—	27	
	BLS04	.268	M5	.356	—	T20	—	35	
	BLS05	.294	M5	.504	—	T20	—	44	
	BLS06	.317	M5	.610	—	T20	—	53	
	BLS08	.375	M6	.803	—	T30	—	58	
	BLS12	.474	M8	.969	—	T30	—	58	
	**BRS105**	.312	M5×0.8	.543	.118	T25	120	66	
	**CAS51T**	.312	M5×0.8	.748	.197	T25	10	75	**BF407** Type Cutter
	✱**CS250560T**	.154	M2.5×0.45	.205	.098	T8	60	8.9	**AL** Type Holder **MMTI** Type Holder **MILLING TOOLS** Series
	CS300790TS	.185	M3×0.5	.276	.089	T10	90	18	
	CS300890T	.161	M3×0.5	.315	.081	T8	90	8.9	
	✱**CS350760T**	.217	M3.5×0.6	.276	.157	T15	60	31	
	CS350790T	.189	M3.5×0.6	.276	.093	T10	90	22	
	✱**CS350860T**	.217	M3.5×0.6	.331	.157	T15	60	31	
	CS350990T	.189	M3.5×0.6	.354	.093	T10	90	22	
	CS400990T	.236	M4×0.7	.354	.110	T15	90	31	
	CS401160T	.224	M4×0.7	.433	.177	T15	60	31	
	CS451190T	.248	M4.5×0.75	.433	.114	T20	90	44	
	CS501290T	.276	M5×0.8	.433	.138	T25	90	66	
	✱**CS5015060T**	.283	M5×0.8	.591	.093	T20	60	44	
	**DC0520T**	.335	M5×0.8	.886	.098	T15	—	31	**DOUBLE CLAMP** Type Holder **DOUBLE CLAMP DIMPLE BAR** **HSK-T** Tool Holder
	DC0621T	.413	M6×1.0	.984	.157	T20	—	44	
	**FC400890T**	.220	M4×0.7	.295	.051	T10	90	22	**AL** Type Holder **AL** Type Boring Bar

SPARE PARTS

CLAMP SCREW

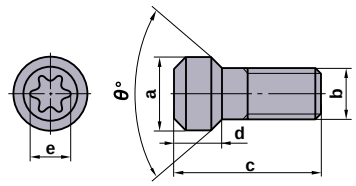
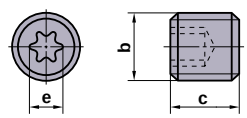
Geometry	Order Number	Dimensions (inch) a	b	c	d	e	θ°	Torque (lbf-in)	Tool Holder
	**GTS1**	.220	6-40UNF	.500	—	T10	—	14	**MTVO** Type Tool Holder **STHN** Type Boring Bar
	GTS**2**	.310	10-32UNF	.750	—	T20	—	45	
	GTS**3**	.350	10-32UNF	.750	—	T20	—	45	
	**GY05016S**	.343	M5×0.8	.630	.138	T20	90	40	**GY** Holder
	**GY06013M**	.472	M6×1.0	.709	.197	T30	—	53	**GY** Holder
	**JSS6**	.272	M6×0.75	.177	.059	.031	—	—	**SP** Type Holder
	JSS**7**	.315	M7×0.75	.173	.059	.039	—	—	
	**LLCS105**	M5×0.8	M5×0.8	.394	.059	.787	—	1.0	**HSK-T** Tool Holder **P** Type Boring Bar
	LLCS**106**	.236	M6×1	.650	.138	.098	—	19	
	LLCS**108**	.315	M8×1.25	.827	.256	.118	—	29	
	✱ **LS21**	M10×1.5	1.260	.472	.472	.197	—	80	**UG** Holder **MILLING TOOLS** Series
	✱ LS**24**	M8×1.25	.945	.335	.335	.157	—	73	
	☆ LS**10T**	M7×0.75	.551	.236	.197	T25	—	75	
	☆ LS**15T**	M7×0.75	.709	.276	.276	T25	—	75	
	☆ LS**19T**	M6×0.75	.433	.157	.157	T15	—	44	
	☆ LS**10TS**	M7×0.75	.512	.236	.157	T25	—	75	
	**LS0622T**	M6×0.75	.866	.315	.315	T15	—	53	**AHX640W** Type Cutter
	**NS251**	.142	M2.5×0.45	.276	—	.087	60	6.2	**SMALL TOOLS**
	NS**401**	.228	M4×0.7	.236	—	.142	60	31	
	**NS402W**	.230	M4×0.7	.394	—	.087	60	6.2	**SMALL TOOLS**
	NS**403W**	.230	M4×0.7	.472	—	.087	60	6.2	
	NS**404W**	.228	M4×0.7	.394	—	.087	90	6.2	

CLAMP SCREW

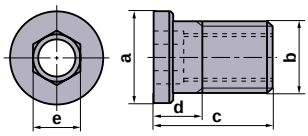
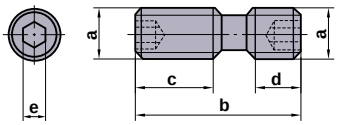
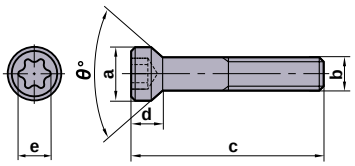
Geometry	Order Number	Dimensions (inch) a	b	c	d	e	θ°	Torque (lbf-in)	Tool Holder
	**NS501W**	.315	M5×0.8	.630	—	.098	120	19	**SMALL TOOLS**
	NS502W	.315	M5×0.8	.787	—	.098	120	19	
	**RS3008TS**	.169	M3×0.35	.331	.079	T8	61	13	**SRF** Type Cutter
	RS3008T	.169	M3×0.35	.339	.079	T8	61	13	
	RS3510T	.197	M3.5×0.35	.394	.091	T10	61	22	
	RS4015T	.236	M4×0.5	.551	.106	T15	61	29	
	RS5020T	.319	M5×0.5	.646	.142	T20	61	44	
	RS6025T	.374	M6×0.75	.846	.165	T25	61	66	
	RS8030T	.472	M8×0.75	.984	.197	T30	61	88	
	**S2**	.157	M2.5×0.45	.256	.091	.079	92	14	
	S3	.177	M3×0.5	.303	.094	.079	92	13	
	**SETS51**	.268	M5×0.8	.583	.059	T15	—	31	**HSK-T** Tool Holder **MMTE** Type Holder **MMTI** Type Holder
	SETS61	.315	M6×1	.787	.071	T20	—	44	
	**SLCS105**	.394	M5×0.8	.984	.248	.157	90	62	
	**S34**	—	10-32UNF	.313	—	.078	—		**M** Type Tool Holder **M** Type Boring Bar
	S46	—	1/4-28UNF	.500	—	.094	—		
	**SRS5**	.264	M5×0.8	.630	.138	T20	—	44	
	**TPS20**	.106	M2×0.4	.138	.051	6IP	60	5.3	**MILLING TOOLS** Series **MVX** Type Drill
	TPS22	.118	M2.2×0.45	.185	.063	7IP	60	5.3	
	TPS22S	.118	M2.2×0.45	.165	.063	7IP	60	5.3	
	TPS25	.130	M2.5×0.45	.217	.067	7IP	60	8.9	
	TPS25-1	.130	M2.5×0.45	.256	.067	7IP	60	8.9	
	TPS3	.154	M3×0.5	.264	.055	10IP	60	17.7	
	TPS35	.209	M3.5×0.6	.453	.110	15IP	60	31	
	TPS351	.189	M3.5×0.6	.281	.055	10IP	60	22	
	TPS4	.209	M4×0.7	.315	.102	15IP	60	31	
	TPS4R	.252	M4×0.7	.417	.087	15IP	R4	31	
	TPS4S	.209	M4×0.7	.276	.102	15IP	60	31	
	TPS43	.209	M4×0.7	.394	.102	15IP	60	31	
	TPS54	.268	M5×0.8	.472	.126	25IP	60	66	

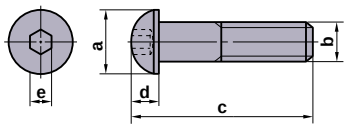
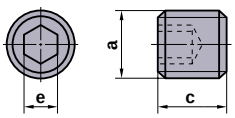
SPARE PARTS

CLAMP SCREW

Geometry	Order Number	Dimensions (inch) a	b	c	d	e	θ°	Torque (lbf-in)	Tool Holder
	∗ **TS16**	.098	M1.6×0.35	.126	.063	T6	60	5.3	**SP** Type Tool Holder
	TS**2**	.106	M2×0.4	.181	.055	T6	60	5.3	**DOUBLE CLAMP** Type Holder
	∗ TS**2A**	.106	M2×0.4	.177	.047	T6	60	5.3	**AL** Type Tool Holder
	TS**2C**	.106	M2×0.4	.150	.055	T6	60	5.3	**SR** Type Tool Holder
	☆ TS**2D**	.150	M2×0.4	.209	.076	T6	82	5.3	**SMALL TOOLS**
	TS**21**	.106	M2×0.4	.134	.055	T6	60	5.3	**DIMPLE BAR**
	∗ TS**22**	.118	M2.2×0.45	.197	.047	T6	60	5.3	**S Type** Boring Bar
	∗ TS**25**	.130	M2.5×0.45	.217	.067	T8	60	8.9	**MICRO-DEX**
	☆ TS**25D**	.172	M2.5×0.45	.244	.087	T8	82	8.9	**GY** Holder
	∗ TS**25H**	.142	M2.5×0.45	.217	.079	T8	60	8.9	**MMTI** Type Holder
	TS**202**	.106	M2×0.4	.217	.071	T6	60	5.3	**F Type** Boring Bar
	TS**253**	.130	M2.5×0.45	.177	.067	T8	60	8.9	**HSK-T** Tool Holder
	TS**254**	.130	M2.5×0.45	.276	.067	T8	60	8.9	**MILLING TOOLS** Series
	∗ TS**255**	.138	M2.5×0.45	.295	.063	T8	60	8.9	**TAF** Drill
	TS**3**	.154	M3×0.5	.236	.079	T8	60	8.9	
	TS**3D**	.197	M3×0.5	.236	.091	T10	82	22	
	TS**3SB**	.173	M3×0.5	.315	.079	T8	80	13	
	TS**31D**	.189	M3×0.5	.283	.087	T10	82	22	
	∗ TS**32**	.154	M3×0.5	.295	.079	T8	60	8.9	
	∗ TS**33**	.154	M3×0.5	.264	.079	T8	60	8.9	
	TS**35**	.189	M3.5×0.6	.256	.094	T10	60	22	
	∗ TS**35D**	.209	M3.5×0.6	.472	.110	T15	60	31	
	TS**351**	.189	M3.5×0.6	.283	.094	T10	60	22	
	TS**352**	.189	M3.5×0.6	.394	.118	T10	60	22	
	TS**4S**	.213	M4×0.7	.276	.093	T15	80	31	
	∗ TS**4SL**	.213	M4×0.7	.315	.096	T15	80	35	
	TS**4**	.213	M4×0.7	.315	.102	T15	60	31	
	TS**4D**	.220	M4×0.7	.303	.098	T15	82	31	
	TS**4SB**	.228	M4×0.7	.354	.105	T15	80	31	
	∗ TS**4SBL**	.228	M4×0.7	.413	.105	T15	80	31	
	∗ TS**4SBLL**	.228	M4×0.7	.571	.105	T15	80	31	
	TS**42**	.213	M4×0.7	.236	.102	T15	60	31	
	TS**43**	.213	M4×0.7	.394	.102	T15	60	31	
	TS**44**	.213	M4×0.7	.472	.102	T15	60	31	
	TS**406**	.213	M4×0.7	.610	.102	T15	60	31	
	TS**407**	.213	M4×0.7	.354	.102	T15	60	31	
	TS**450**	.232	M4.5×0.75	.512	.142	T20	60	44	
	TS**5S**	.268	M5×0.8	.354	.115	T25	80	66	
	TS**5**	.268	M5×0.8	.354	.126	T25	60	66	
	TS**5L**	.268	M5×0.8	.591	.115	T25	80	66	
	TS**52**	.268	M5×0.8	.315	.126	T25	60	66	
	TS**53**	.268	M5×0.8	.630	.126	T25	60	66	
	TS**54**	.268	M5×0.8	.472	.126	T25	60	66	
	TS**55**	.268	M5×0.8	.413	.126	T25	60	66	
	∗ TS**6S**	.335	M6×1.0	.512	.173	T30	60	89	
	∗ TS**6**	.335	M6×1.0	.630	.173	T30	60	89	
	**TSS04005**	—	M4×0.7	.197	—	T8	—	—	**PMF** Type Cutter

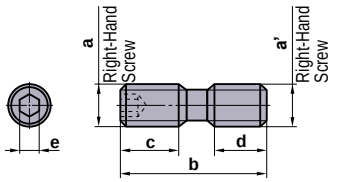
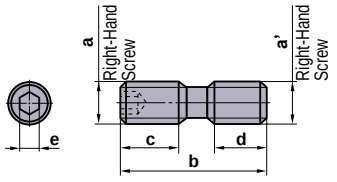
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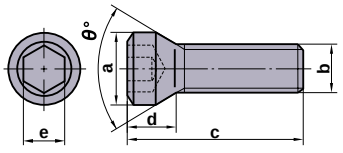
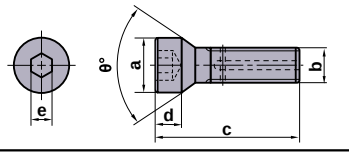
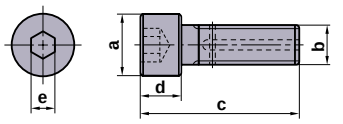
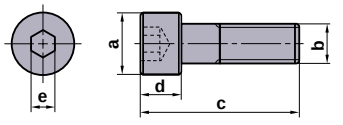
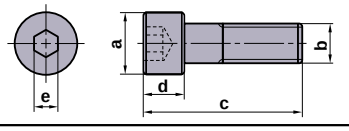
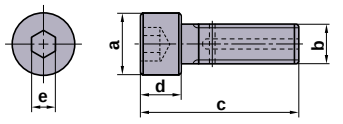
Geometry	Order Number	Dimensions (inch) a	b	c	d	e	θ°	Torque (lbf-in)	Tool Holder
	**WCS503507H**	.248	M5×0.5	.276	.130	.138	—	44	**ASX445** Type Cutter **ASX400** Type Cutter **PMR** Type Cutter
	**XNS35**	10-32UNF	.625	.220	.220	.094	—	30	**M** Type Tool Holder **M** Type Boring Bar **MTVO** Type Holder
	XNS**36**	10-32UNF	.750	.250	.250	.094	—	30	
	XNS**46**	1/4-28UNF	.750	.310	.310	.125	—	45	
	XNS**47**	1/4-28UNF	.875	.280	.280	.125	—	45	
	XNS**48**	1/4-28UNF	1.000	.370	.370	.125	—	45	
	XNS**58**	5/16-24UNF	1.000	.500	.280	.156	—	70	
	XNS**59**	5/16-24UNF	1.120	.470	.410	.156	—	70	
	XNS**510**	5/16-24UNF	1.125	.500	.500	.156	—	70	
	XNS**610**	3/8-24UNF	1.250	.500	.500	.188	—	135	
	**WS254012T**	.157	M2.5×0.45	.453	.087	T8	80	18	**TAW** Drill
	WS**254013T**	.157	M2.5×0.45	.492	.087	T8	80	18	
	WS**254014T**	.157	M2.5×0.45	.531	.087	T8	80	18	
	WS**254015T**	.157	M2.5×0.45	.571	.087	T8	80	18	
	WS**254016T**	.157	M2.5×0.45	.610	.087	T8	80	18	
	WS**304517T**	.177	M3×0.5	.650	.134	T10	60	31	
	WS**304518T**	.177	M3×0.5	.689	.134	T10	60	31	
	WS**355520T**	.217	M3.5×0.6	.768	.154	T15	60	49	
	WS**355521T**	.217	M3.5×0.6	.807	.154	T15	60	49	
	WS**406023T**	.236	M4×0.7	.866	.173	T25	60	75	
	WS**406024T**	.236	M4×0.7	.906	.173	T25	60	75	
	WS**508026T**	.315	M5×0.8	.984	.205	T27	60	110	
	WS**508027T**	.315	M5×0.8	1.024	.205	T27	60	110	

Geometry	Order Number	Dimensions (inch) a	b	c	d	e	θ°	Torque (lbf-ft)	Tool Holder
	**HBH04008**	.295	M4×0.7	.417	.110	.098	—	0.8	**V10000** Type Cutter **PMF** Type Cutter **MG** Type Tool Holder **HSK-T** Tool Holder **FF3000** Type Cutter
	HBH**06012**	.413	M6×1	.630	.157	.157	—	4	
	HBH**06020**	.413	M6×1	.945	.157	.157	—	4	
	HBH**08040**	.551	M8×1.25	1.772	.197	.197	—	6.8	
	**HSS05006**	—	M5×0.8	.236	—	.098	—	4	**HSK-T** Tool Holder **MVX** Drill
	HSS**05012**	—	M5×0.8	.472	—	.098	—	4	
	HSS**06008**	—	M6×1	.315	—	.118	—	6.8	
	HSS**08005**	—	M8×1.25	.197	—	.157	—	16	
	HSS**08006**	—	M8×1.25	.236	—	.157	—	16	
	HSS**08008**	—	M8×1.25	.315	—	.157	—	16	
	HSS**08010**	—	M8×1.25	.394	—	.157	—	16	
	HSS**08012**	—	M8×1.25	.472	—	.157	—	16	
	HSS**10012**	—	M10x1.5	.472	—	.197	—	33	
	HSS**10016**	—	M10×1.5	.630	—	.197	—	33	
	HSS**12016**	—	M12×1.75	.630	—	.236	—	56	
	HSS**12018**	—	M12×1.75	.709	—	.236	—	56	
	HSS**12025**	—	M12×1.75	.984	—	.236	—	56	
	HSS**12030**	—	M12×1.75	1.181	—	.236	—	56	
	HSS**14030**	—	M14×2	1.181	—	.236	—	56	
	HSS**14035**	—	M14×2	1.378	—	.236	—	56	
	HSS**16012**	—	M16×2	.472	—	.315	—	140	
	HSS**16020**	—	M16×2	.787	—	.315	—	140	

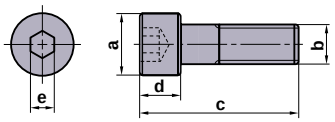
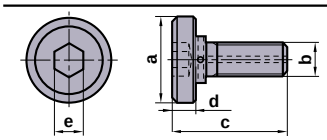
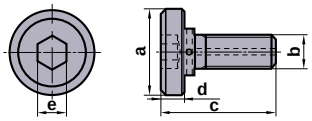
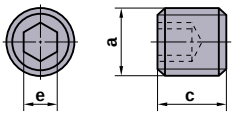
SPARE PARTS

SET BOLT

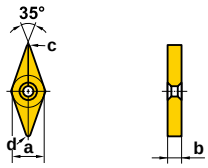
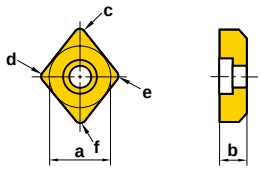
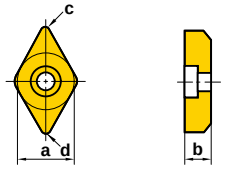
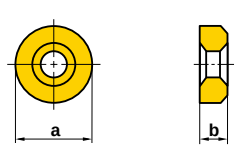
Geometry	Order Number	Dimensions (inch) a	a'	b	c	d	e	Torque (lbf-ft)	Tool Holder
	**HDS10031**	M10x1.0	M10x1.5	1.220	.551	.472	.197	6.6	**PMF** Type Cutter
	**HDSU37513**	5/16-32UNEF	3/8-24UNF	1.260	.472	.433	.156	6.1	**BOE** Type Cutter **BRP** Type Cutter

Geometry	Order Number	Dimensions (inch) a	b	c	d	e	θ°	Torque (lbf-ft)	Tool Holder
	**BOE4S06U**	.562	3/8-24UNF	1.358	.374	.313	60	29	**BOE** Type Cutter
	**HFF08043H**	.433	M8×1.25	1.693	.197	.197	90	6.1	**AXD4000** Type Cutter **BXD4000** Type Cutter
	**HSCU25011H**	.370	1/4-28UNF	1.347	.250	.156	—	10	**WSX445** Type Cutter **AJX** Type Cutter **APX3000** Type Cutter **APX4000** Type Cutter **AXD7000** Type Cutter **BAP3500** Type Cutter **BXD4000** Type Cutter
	HSCU25014H	.370	1/4-28UNF	1.647	.250	.156	—	10	
	HSCU37513H	.562	3/8-24UNF	1.625	.375	.250	—	29	
	HSCU50014H	.750	1/2-20UNF	1.875	.500	.375	—	59	
	HSCU62516H	.938	5/8-18UNF	2.250	.625	.500	—	80	
	HSCU75016H	1.125	3/4-16UNF	2.375	.750	.625	—	110	
	**HSCUF25013**	.375	1/4-28UNF	1.500	.250	.188	—	10	**APX4000** Type Cutter **SPX** Type Cutter
	HSCUF37513	.562	3/8-24UNF	1.625	.375	.313	—	29	
	HSCUF37520	.562	3/8-24UNF	2.375	.375	.313	—	29	
	HSCUF50014	.750	1/2-20UNF	1.875	.500	.375	—	59	
	HSCUF50028	.750	1/2-20UNF	3.248	.500	.375	—	59	
	HSCUF62518	.938	5/8-18UNF	2.375	.625	.500	—	80	
	HSCUF62528	.938	5/8-18UNF	3.373	.625	.500	—	80	
	HSCUF75018	1.125	3/4-16UNF	2.500	.750	.625	—	110	
	**HSCUC62523**	.938	5/8-11UNS	2.875	.625	.500	—	80	
	HSCUC75025	1.125	3/4-10UNS	3.250	.750	.625	—	110	
	**HSC08025H**	.512	M8×1.25	1.299	.315	.197	—	18	**WSX445** Type Cutter **APX3000/4000 • AJX** Type Cutter **APX4000** Type Cutter **AXD4000** Type Cutter **AXD7000** Type Cutter **APX3000/4000 • AJX** Type Cutter **BXD** Type Cutter **VFX5/6** Type Cutter **APX3000/4000 • AJX** Type Cutter **APX3000/4000 • AJX** Type Cutter
	HSC08030H	.512	M8×1.25	1.496	.315	.197	—	18	
	HSC10030H	.630	M10×1.5	1.575	.394	.236	—	29	
	HSC12035H	.709	M12×1.75	1.850	.472	.394	—	59	
	HSC16040H	.945	M16×2	2.205	.630	.551	—	110	

SET BOLT

Geometry	Order Number	Dimensions (inch) a	b	c	d	e	θ°	Torque (lbf-ft)	Tool Holder
	**HSC05030**	.335	M5×0.8	1.181	.197	.157	–	4.0	**APX4000** Type Cutter **PMF** Type Cutter **PMR** Type Cutter **SPX** Type Cutter **VFX6** Type Cutter **GY** Type Tool Holder
	HSC**08040**	.512	M8×1.25	1.890	.315	.236	–	16	
	HSC**08050**	.512	M8×1.25	2.283	.315	.236	–	16	
	HSC**10035**	.630	M10×1.5	1.772	.394	.236	–	33	
	HSC**10045**	.630	M10×1.5	2.165	.394	.315	–	33	
	HSC**10050**	.630	M10×1.5	2.362	.394	.315	–	33	
	HSC**10055**	.630	M10×1.5	2.559	.394	.315	–	33	
	HSC**12035**	.709	M12×1.75	1.850	.472	.394	–	56	
	HSC**12040**	.709	M12×1.75	2.047	.472	.394	–	56	
	HSC**12045**	.709	M12×1.75	2.244	.472	.394	–	56	
	HSC**12070**	.709	M12×1.75	3.228	.472	.394	–	56	
	HSC**16040**	.945	M16×2.0	2.205	.630	.551	–	140	
	HSC**16065**	.945	M16×2.0	3.189	.630	.551	–	140	
	HSC**16080**	.945	M16×2.0	3.780	.630	.551	–	140	
	HSC**20040**	1.181	M20×2.5	2.362	.787	.669	–	273	
	HSC**20090**	1.181	M20×2.5	4.331	.787	.669	–	273	
	**MBAU75016H**	2.000	3/4-16UNF	2.188	.563	.625	–	236	**AJX** Type Cutter **AXD7000** Type Cutter
	MBAU**100016H**	2.593	1-14UNS	2.188	.563	.625	–	384	
	**MBA16033H**	1.575	M16×2	1.693	.394	.551	–	110	**AJX** Type Cutter **APX4000** Type Cutter **AXD4000** Type Cutter **AXD7000** Type Cutter **BXD4000** Type Cutter
	MBA**20040H**	1.969	M20×2.5	2.126	.551	.669	–	236	
	MBA**24045H**	2.559	M24×3.0	2.323	.551	.669	–	384	
	**HGM-PT1/8**	–	1/8-28	.276	–	.197	–	33	**HSK-T** Tool Holder

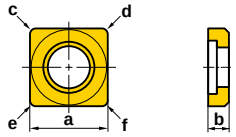
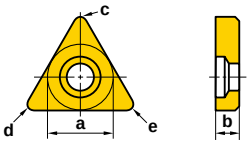
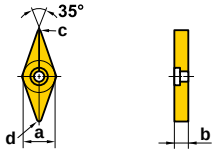
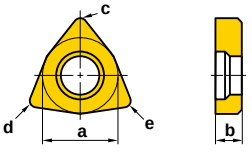
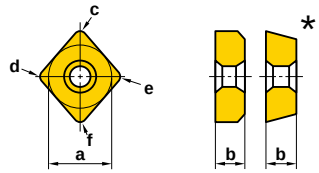
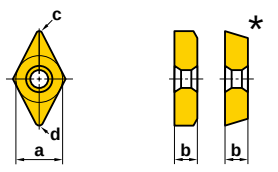
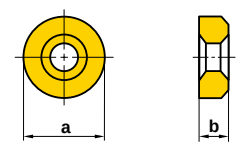
SHIM

Geometry	Order Number	Dimensions (inch) a	b	c	d	e	f	Tool Holder
	**DCSVN32**	.375	.125	.031	.047	–	–	**DOUBLE CLAMP** Type Holder **DOUBLE CLAMP DIMPLE BAR**
	**ICSN322**	.375	.125	.031	.031	.031	.031	**M** Type Tool Holder **M** Type Boring Bar
	ICSN**432**	.500	.188	.031	.031	.031	.031	
	ICSN**433**	.500	.188	.047	.047	.047	.047	
	ICSN**533**	.625	.188	.047	.047	.047	.047	
	ICSN**633**	.750	.188	.047	.047	.047	.047	
	**IDSN322**	.375	.125	.031	.031	–	–	**M** Type Tool Holder **M** Type Boring Bar
	IDSN**433**	.500	.188	.047	.047	–	–	
	IDSN**533**	.625	.188	.047	.047	–	–	
	IDSN**543**	.625	.250	.047	.047	–	–	
	**IRSN32**	.375	.125	–	–	–	–	**M** Type Tool Holder
	IRSN**43**	.500	.188	–	–	–	–	
	IRSN**44**	.500	.250	–	–	–	–	
	IRSN**63**	.750	.188	–	–	–	–	

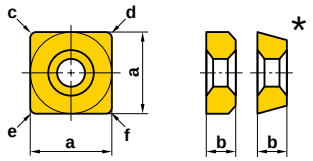
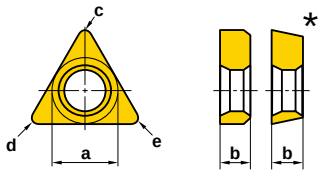
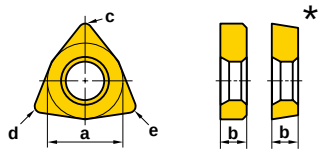
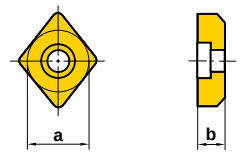
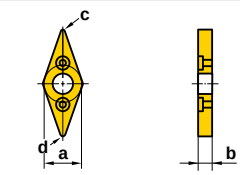
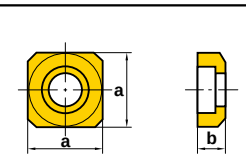
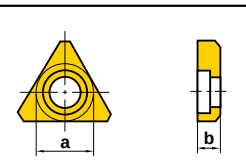
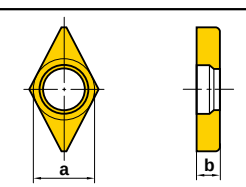
SPARE PARTS

SPARE PARTS

SHIM

Geometry	Order Number	Dimensions (inch)						Tool Holder
		a	b	c	d	e	f	
	**ISSN322**	.375	.125	.031	.031	.031	.031	**M** Type Tool Holder **M** Type Boring Bar
	ISSN**323**	.375	.125	.047	.047	.047	.047	
	ISSN**433**	.500	.188	.047	.047	.047	.047	
	ISSN**434**	.500	.188	.063	.063	.063	.063	
	ISSN**443**	.500	.250	.047	.047	.047	.047	
	ISSN**533**	.625	.188	.047	.047	.047	.047	
	ISSN**633**	.750	.188	.047	.047	.047	.047	
	ISSN**634**	.750	.188	.063	.063	.063	.063	
	ISSN**643**	.750	.250	.047	.047	.047	.047	
	ISSN**644**	.750	.250	.063	.063	.063	.063	
	ISSN**846**	1.000	.250	.094	.094	.094	.094	
	**ITSN322**	.375	.125	.031	.031	.031	–	**M** Type Tool Holder **M** Type Boring Bar
	ITSN**323**	.375	.125	.047	.047	.047	–	
	ITSN**324**	.375	.125	.063	.063	.063	–	
	ITSN**332**	.375	.188	.031	.031	.031	–	
	ITSN**333**	.375	.188	.047	.047	.047	–	
	ITSN**334**	.375	.188	.063	.063	.063	–	
	ITSN**432**	.500	.188	.031	.031	.031	–	
	ITSN**434**	.500	.188	.063	.063	.063	–	
	ITSN**438**	.500	.188	.125	.125	.125	–	
	ITSN**533**	.625	.188	.047	.047	.047	–	
	ITSN**534**	.625	.188	.063	.063	.063	–	
	ITSN**633**	.750	.188	.047	.047	.047	–	
	ITSN**636**	.750	.188	.094	.094	.094	–	
	**IVSN322**	.375	.125	.031	.031	–	–	**M** Type Tool Holder **M** Type Boring Bar
	IVSN**432**	.500	.188	.031	.031	–	–	
	IVSN**433**	.500	.188	.047	.047	–	–	
	**IWSN322**	.375	.125	.031	.031	.031	–	**M** Type Tool Holder **M** Type Boring Bar
	IWSN**432**	.500	.188	.031	.031	.031	–	
	IWSN**533**	.625	.188	.047	.047	.047	–	
	**LLSCN32**	.375	.125	.016	.016	.031	.031	**DOUBLE CLAMP** Type Holder **DOUBLE CLAMP DIMPLE BAR** **HSK-T** Tool Holder
	LLSCN**33**	.375	.188	.016	.016	.031	.031	
	LLSCN**42**	.500	.125	.031	.031	.047	.047	
	✱ **LLSCP32**	.375	.125	.016	.016	.031	.031	
	✱ LLSCP**42**	.500	.125	.031	.031	.047	.047	
	**LLSDN32**	.375	.125	.031	.047	–	–	**DOUBLE CLAMP** Type Holder **DOUBLE CLAMP DIMPLE BAR** **HSK-T** Tool Holder
	LLSDN**42**	.500	.125	.031	.047	–	–	
	LLSDN**43**	.500	.188	.031	.047	–	–	
	✱ **LLSDP42**	.500	.125	.031	.047	–	–	
	**LLSRN123**	.386	.125	–	–	–	–	**DOUBLE CLAMP** Type Holder **HSK-T** Tool Holder

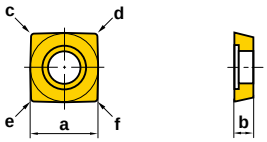
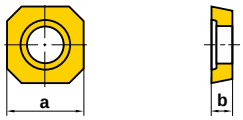
SHIM

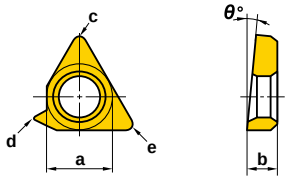
Geometry	Order Number	Dimensions (inch)						Tool Holder
		a	b	c	d	e	f	
	**LLSSN42**	.500	.125	.031	.031	.047	.047	**DOUBLE CLAMP** Type Holder **DOUBLE CLAMP DIMPLE BAR**
	✱ **LLSSP42**	.500	.125	.031	.031	.047	.047	
	**LLSTN32**	.375	.125	.016	.031	.047	–	**DOUBLE CLAMP** Type Holder **DOUBLE CLAMP DIMPLE BAR**
	LLSTN33	.375	.188	.016	.031	.047	–	
	✱ **LLSTP32**	.375	.125	.016	.031	.047	–	
	**LLSWN32**	.375	.125	.016	.031	.047	–	**DOUBLE CLAMP** Type Holder **DOUBLE CLAMP DIMPLE BAR**
	LLSWN33	.375	.188	.016	.031	.047	–	
	LLSWN42	.500	.125	.016	.031	.047	–	
	✱ **LLSWP42**	.500	.125	.016	.031	.047	–	
	**SPSCN42**	.500	.125	–	–	–	–	**SP** Type Tool Holder
	**SPSVN32**	.317	.125	.012	.012	–	–	**SP** Type Tool Holder **HSK-T** Tool Holder
	**SPSSN42**	.468	.125	–	–	–	–	**SP** Type Tool Holder
	**SPSTN32**	.352	.125	–	–	–	–	**SP** Type Tool Holder
	**SPSDN32**	.342	.125	–	–	–	–	**SP** Type Tool Holder

SPARE PARTS

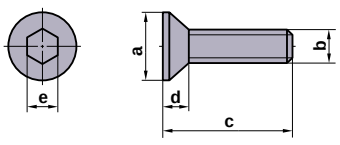
SPARE PARTS

SHIM

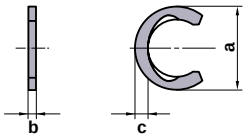
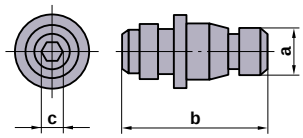
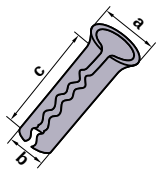
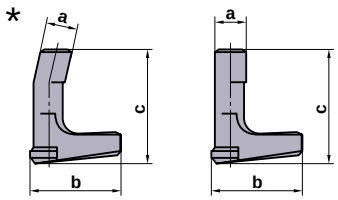
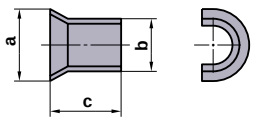
Geometry	Order Number	Dimensions (inch) a	b	c	d	e	f	Tool Holder
	**STASX400N**	.433	.118	.015	.015	.015	.015	**ASX400** Type Cutter
	**STASX445N**	.424	.118	—	—	—	—	**ASX445** Type Cutter

Geometry	Order Number	Dimensions (inch) a	b	c	d	e	θ°	Tool Holder
	**CTE32TN15**	.375	.128	.031	.016	.031	2.955	**MMT** Type Tool Holder **HSK-T** Tool Holder
	CTE32TN05	.375	.128	.031	.016	.031	1.970	
	CTE32TP05	.375	.126	.031	.016	.031	.985	
	CTE32TP15	.375	.125	.031	.016	.031	0	
	CTE32TP25	.375	.133	.031	.016	.031	-.985	
	CTE32TP35	.375	.141	.031	.016	.031	-1.970	
	CTE32TP45	.375	.149	.031	.016	.031	-2.995	
	CTI32TN15	.375	.128	.031	.016	.031	2.898	
	CTI32TN05	.375	.128	.031	.016	.031	1.932	
	CTI32TP05	.375	.126	.031	.016	.031	.966	
	CTI32TP15	.375	.125	.031	.016	.031	0	
	CTI32TP25	.375	.133	.031	.016	.031	-.966	
	CTI32TP35	.375	.141	.031	.016	.031	-1.932	
	CTI32TP45	.375	.146	.031	.016	.031	-2.898	
	CTE43TN15	.500	.192	.039	.024	.039	2.955	
	CTE43TN05	.500	.191	.039	.024	.039	1.970	
	CTE43TP05	.500	.189	.039	.024	.039	.985	
	CTE43TP15	.500	.187	.039	.024	.039	0	
	CTE43TP25	.500	.198	.039	.024	.039	-.985	
	CTE43TP35	.500	.209	.039	.024	.039	-1.970	
	CTE43TP45	.500	.219	.039	.024	.039	-2.995	
	CTI43TN15	.500	.192	.039	.024	.039	2.898	
	CTI43TN05	.500	.191	.039	.024	.039	1.932	
	CTI43TP05	.500	.189	.039	.024	.039	.966	
	CTI43TP15	.500	.187	.039	.024	.039	0	
	CTI43TP25	.500	.198	.039	.024	.039	-.966	
	CTI43TP35	.500	.208	.039	.024	.039	-1.932	
	CTI43TP45	.500	.219	.039	.024	.039	-2.898	

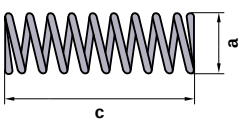
SHIM SCREW

Geometry	Order Number	Dimensions (inch) a	b	c	d	e	Torque (lbf-ft)	Tool Holder
	**HFC03006**	.118	M3×0.5	.236	.067	.079	6	**MMT** Type Tool Holder **HSK-T** Tool Holder
	HFC03008	.118	M3×0.5	.315	.067	.079	6	
	HFC04008	.157	M4×0.7	.315	.091	.098	10	
	HFC04010	.157	M4×0.7	.394	.091	.098	10	

PIN / RING / CLAMP LEVER

Geometry	Order Number	Dimensions (inch) a	b	c	Tool Holder
	**CR4**	.262	.016	.041	**MMTE** Type Holder **HSK-T** Tool Holder
	CR5	.304	.026	.045	
	**NL23**	.313–1.260	.313	.063	**M** Type Tool Holder **M** Type Boring Bar
	NL33	.313–1.260	.347	.078	
	NL33L	.394–1.260	.406	.078	
	NL34	.394–1.260	.453	.078	
	NL34L	.394–1.260	.500	.078	
	NL43	.394–1.260	.422	.078	
	NL44	.250–1.102	.516	.094	
	NL46	.250–1.102	.688	.094	
	NL56	.313–.945	.703	.125	
	NL58	.313–.945	.844	.125	
	NL68	.375–.945	.875	.141	
	NL68L	.375–.945	.938	.141	
	NL810	.438–.787	.813	.156	
	**BCP141**	.118	.055	.220	**SP** Type Holder **HSK-T** Tool Holder
	**LLCL14**	.185	.528	.520	**HSK-T** Tool Holder
	LLCL24	.185	.638	.583	
	* **LLCL112**	.138	.512	.531	
	**LLP13**	.219	.191	.209	**DOUBLE CLAMP** Type Holder **DOUBLE CLAMP DIMPLE BAR** **HSK-T** Tool Holder
	LLP14	.285	.258	.228	
	LLP23	.219	.191	.268	
	LLP24	.285	.258	.358	

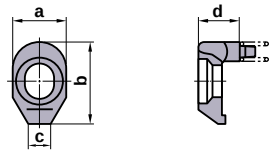
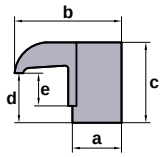
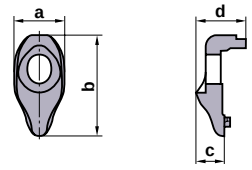
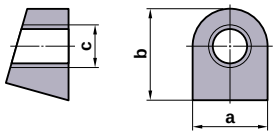
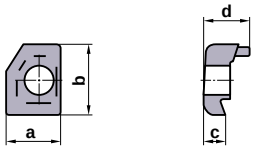
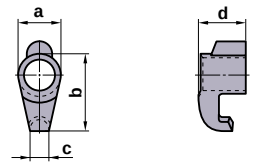
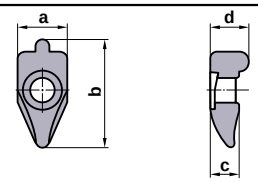
SPRING

Geometry	Order Number	Dimensions (inch) a	c	Tool Holder
	**DCS1**	.335	.433	**DOUBLE CLAMP** Type Holder **DOUBLE CLAMP DIMPLE BAR** **MG** Type Tool Holder **HSK-T** Tool Holder
	MES3	.307	.394	

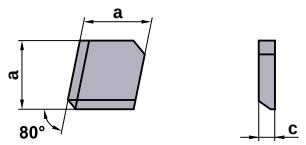
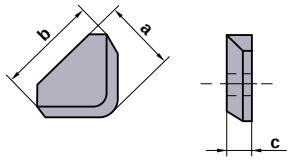
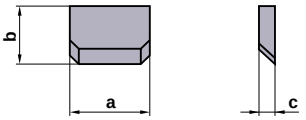
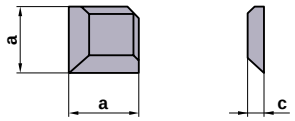
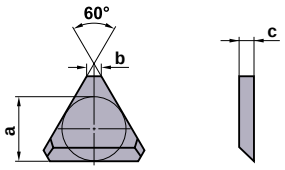
SPARE PARTS

SPARE PARTS

CLAMP BRIDGE

Geometry	Order Number	Dimensions (inch) a	b	c	d	e	Tool Holder
	**AMS3**	.276	.472	.118	.130	—	**DOUBLE CLAMP** Type Holder **AJX** Type Cutter **PMC** Type Cutter
	AMS**4**	.354	.531	.118	.150	—	
	AMS**5**	.394	.590	.136	.197	—	
	**CL6**	.310	.580	.440	.062	.094	**M** Type Tool Holder **M** Type Boring Bar **MTVO** Type Tool Holder
	CL**7**	.310	.640	.310	.062	—	
	CL**9**	.430	.750	.660	.344	.125	
	CL**12**	.430	.880	.660	.344	.125	
	CL**19**	.310	.550	.310	.187	—	
	CL**20**	.375	.730	.380	.125	—	
	CL**24**	.491	1.000	.785	.453	.136	
	CL**30**	.430	1.000	.660	.344	.125	
	**DCK2211**	.433	.866	.259	.357	—	**DOUBLE CLAMP** Holder **DOUBLE CLAMP DIMPLE BAR** **HSK-T** Tool Holder
	DCK**2613**	.512	1.043	.289	.407	—	
	DCK**3113**	.512	1.220	.354	.472	—	
	**KGC1**	.402	.590	M7×0.75	—	—	**UG** Holder
	**MTK1R/L**	.512	.689	.197	.472	—	**HSK-T** Tool Holder
	**SETK51**	.268	.571	.114	.315	—	**MMTE** Type Holder **MMTI** Type Holder **HSK-T** Tool Holder
	SETK**61**	.350	.713	.161	.339	—	
	**SRK1R**	.370	.827	.216	.295	—	

CHIPBREAKER

Geometry	Order Number	Dimensions (inch)					Tool Holder
		a	b	c	Insert I.C.	Breaker Width	
	**CBC4**	.440	–	.062	.500	–	**M** Type Tool Holder **M** Type Boring Bar
	**CBR4**	.421	.560	.120	.500	–	**M** Type Tool Holder
	**CBS3** CBS**4**	.370 .496	.315 .362	.059 .098	.375 .500	.059 .138	**M** Type Tool Holder **M** Type Boring Bar
	**CBS3D** CBS**4D**	.315 .402	– –	.059 .098	.375 .500	.059 .098	**M** Type Tool Holder
	**CBT3**	.283	.055	.098	.375	.138	**M** Type Tool Holder **M** Type Boring Bar

SPARE PARTS

SPARE PARTS

ANTI SEIZE LUBRICANT

Shape	Order Number	Stock	Volume (oz)
	**MK1KS**	●	0.1

● : **Inventory maintained.**

TECHNICAL DATA

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CHIP CONTROL FOR TURNING N004
EFFECTS OF CUTTING CONDITIONS FOR TURNING N005
FUNCTION OF TOOL FEATURES FOR TURNING N007
FORMULAS FOR CUTTING N011
TROUBLE SHOOTING FOR MILLING N012
FUNCTION OF TOOL FEATURES FOR FACE MILLING N013
FORMULAS FOR MILLING N016
TROUBLE SHOOTING FOR END MILLING N017
END MILL FEATURES AND SPECIFICATION N018
END MILL TYPE AND GEOMETRY N019
PITCH SELECTION OF PICK FEED N020
TROUBLE SHOOTING FOR DRILLING N021
DRILL WEAR CONDITION AND CUTTING EDGE DAMAGE N022
DRILL TERMINOLOGY AND CUTTING CHARACTERISTICS N023
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MATERIAL CROSS REFERENCE LIST N028
SURFACE ROUGHNESS N032
HARDNESS COMPARISON TABLE N033
CUTTING TOOL MATERIALS N034
GRADE CHAIN N035
GRADE COMPARISON TABLE N036
INSERT CHIP BREAKER COMPARISION TABLE N042

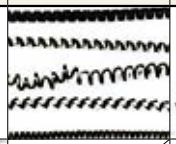
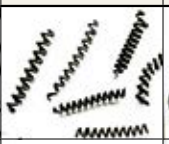
TROUBLE SHOOTING FOR TURNING

Trouble	Factors	Solutions	Insert Grade Selection: Select a Harder Grade	Insert Grade Selection: Select a Tougher Grade	Insert Grade Selection: Select a Grade with Better Thermal Shock Resistance	Insert Grade Selection: Select a Grade with Better Adhesion Resistance	Cutting Conditions: Cutting Speed (Up ↗ / Down ↘)	Cutting Conditions: Feed Rate (Up ↗ / Down ↘)	Cutting Conditions: Depth of Cut (Up ↗ / Down ↘)	Cutting Conditions: Cutting Fluids: Do Not Use Water-soluble Cutting Fluid	Cutting Conditions: Cutting Fluids: Determine Dry or Wet Cutting	Style and Design of the Tool: Select Chip Breaker	Style and Design of the Tool: Rake Angle (Up ↗ / Down ↘)	Style and Design of the Tool: Corner Radius (Up ↗ / Down ↘)	Style and Design of the Tool: Lead Angle (Up ↗ / Down ↘)	Style and Design of the Tool: Honing Strengthens the Cutting Edge (Up ↗ / Down ↘)	Style and Design of the Tool: Class of Insert (Unground-Ground)	Style and Design of the Tool: Improve Tool Holder Rigidity	Machine and Installation of Tool: Installation of the Tool and Workpiece	Machine and Installation of Tool: Toolholder Overhang	Machine and Installation of Tool: Machine with Inadequate Horsepower and Rigidity
Short Tool Life	Rapid insert wear	Improper tool grade	●																		
		Improper cutting edge geometry										●	↗●	↗●	↗●	●↘					
		Improper cutting conditions					●↘	↗●			Wet										
	Chipping and fracturing of cutting edge	Improper tool grade		●																	
		Improper cutting conditions						●↘	●↘												
		Lack of cutting edge strength										●		↗●		↗●					
		Thermal cracking			●		●↘	●↘	●↘	●	Dry										
		Built-up edge				●	↗●	↗●		●	Wet										
		Lack of rigidity																●	●	●	●
Worsening Dimensional Accuracy	Dimensional unevenness during machining	Improper insert tolerance															●				
		Large cutting resistance and cutting edge flank										●	●	●↘	●↘	●↘		●	●	●	●
	Machining accuracy not maintained adjustment is necessary each time	Improper tool grade	●																		
		Improper cutting conditions					●↘	↗●													
Poor Surface Finish	Worsening surface roughness	Welding occurs					↗●			●	Wet										
		Improper cutting edge geometry										●		↗●							
		Vibration occurs					●↘	●↘	●↘										●	●	●
Heat Generation	Cutting heat creates deterioration in machining accuracy and tool life	Improper cutting conditions					●↘	●↘	●↘												
		Improper cutting edge geometry										●	↗●			●↘					

Trouble		Factors / Solutions	Insert Grade Selection: Select a Harder Grade	Insert Grade Selection: Select a Tougher Grade	Insert Grade Selection: Select a Grade with Better Thermal Shock Resistance	Insert Grade Selection: Select a Grade with Better Adhesion Resistance	Cutting Conditions: Cutting Speed (Up ↗ / Down ↘)	Cutting Conditions: Feed Rate (Up ↗ / Down ↘)	Cutting Conditions: Depth of Cut (Up ↗ / Down ↘)	Cutting Conditions: Cutting Fluids: Do Not Use Water-soluble Cutting Fluid	Cutting Conditions: Cutting Fluids: Determine Dry or Wet Cutting	Style and Design of the Tool: Select Chip Breaker	Style and Design of the Tool: Rake Angle (Up ↗ / Down ↘)	Style and Design of the Tool: Corner Radius (Up ↗ / Down ↘)	Style and Design of the Tool: Lead Angle (Up ↗ / Down ↘)	Style and Design of the Tool: Honing Strengthens the Cutting Edge (Up ↗ / Down ↘)	Style and Design of the Tool: Class of Insert (Unground-Ground)	Style and Design of the Tool: Improve Tool Holder Rigidity	Machine and Installation of Tool: Installation of the Tool and Workpiece	Machine and Installation of Tool: Toolholder Overhang	Machine and Installation of Tool: Machine with Inadequate Horsepower and Rigidity
Burr / Chipping / Roughness	Burr (Steel, Aluminum alloy)	Notch wear occurs	●																		
		Improper cutting conditions					● ↘	↗ ●			● Wet										
		Improper cutting edge geometry										●	↗ ●	● ↘	● ↘	● ↘					
	Chipping (Cast iron)	Improper cutting conditions						● ↘	● ↘												
		Improper cutting edge geometry										●	↗ ●	↗ ●	↗ ●	● ↘					
		Vibration occurs																●	●	●	●
	Roughness (Mild steel)	Improper tool grade				●															
		Improper cutting conditions					↗ ●			●	● Wet										
		Improper cutting edge geometry										●	↗ ●			● ↘					
		Vibration occurs																●	●	●	●
Chip Control	Uncontrolled, continuous / tangled	Improper cutting conditions					● ↘	↗ ●	↗ ●		● Wet										
		Wide chip control range										●									
		Improper cutting edge geometry												● ↘	● ↘						
	Broken into short lengths and scatter	Improper cutting conditions						● ↘	● ↘		● Dry										
		Small chip control range										●									
		Improper cutting edge geometry												↗ ●	↗ ●						

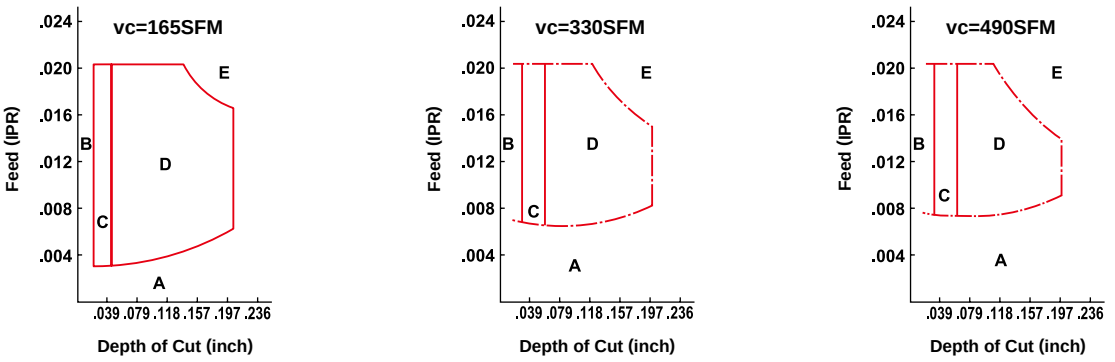
CHIP CONTROL FOR TURNING

CHIP BREAKING CONDITIONS IN STEEL TURNING

Type	A Type	B Type	C Type	D Type	E Type
Small Depth of Cut d <.276"					
Large Depth of Cut d=.276"–.591"					
Curl Length l	Curless	l≥2inch	l≤2inch 1–5 Curl	≒ 1 Curl	1 curl–half curl
Note	●Irregular continuous shape ●Tangle about tool and workpiece	●Regular continuous shape ●Long chips	Good	Good	●Chip scattering ●Chattering ●Poor finished surface ●Maximum

Cutting Speed and Chip Control Range of Chip Breaker

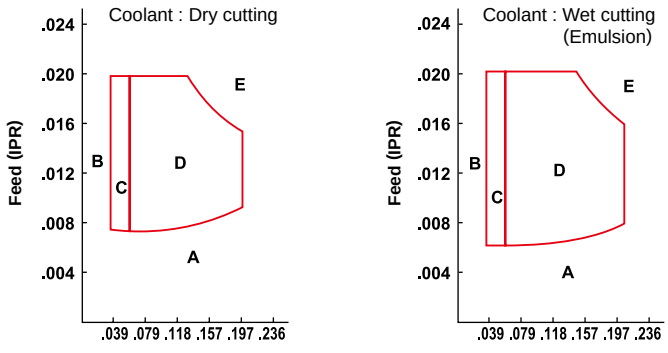
In general, when cutting speed increases, the chip control range tends to become narrower.



Workpiece : **AISI 1045 (180HB)**
Insert : **TNMG332**
Grade : **P10**Grade
Tool : **MTJNR2525M16N**
Dry Cutting

Effects of Coolant on the Chip Control Range of a Chip Breaker

If the cutting speed is the same, the range of chip control differs according to whether coolant is used or not.



Workpiece : **AISI 1045**
Cutting Condition : **vc=330SFM**

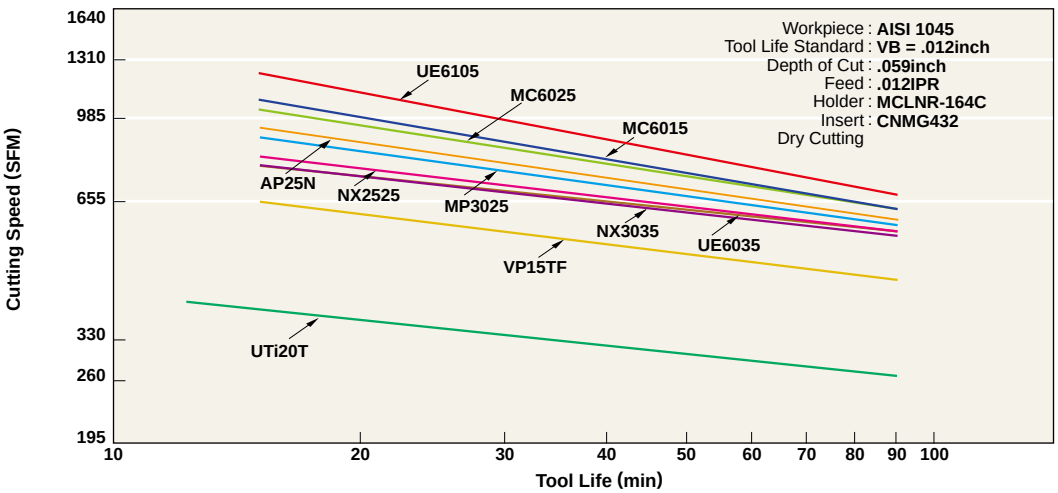
EFFECTS OF CUTTING CONDITIONS FOR TURNING

EFFECTS OF CUTTING CONDITIONS

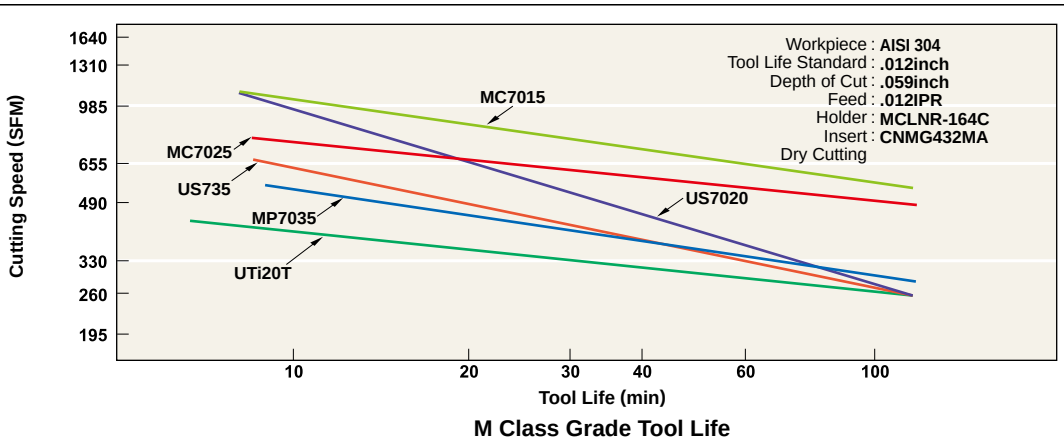
Ideal conditions for cutting are short cutting time, long tool life, and high cutting accuracy. In order to obtain these conditions, selection of efficient cutting conditions and tool, based on work material, hardness, shape and machine capability is necessary.

CUTTING SPEED

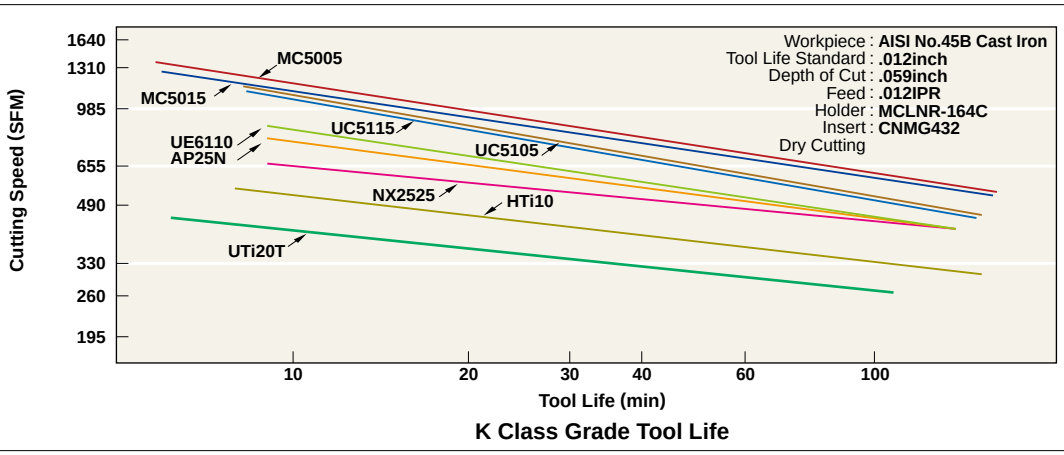
Cutting speed effects tool life greatly. Increasing cutting speed increases cutting temperature and results in shortening tool life. Cutting speed varies depending on the type and hardness of the work material. Selecting a tool grade suitable for the cutting speed is necessary.



P Class Grade Tool Life



M Class Grade Tool Life



K Class Grade Tool Life

Effects of Cutting Speed

1. Increasing cutting speed by 20% decreases tool life to 1/2. Increasing cutting speed by 50% decreases tool life to 1/5.
2. Cutting at low cutting speed (65—130 SFM) tends to cause chattering. Thus, tool life is shortened.

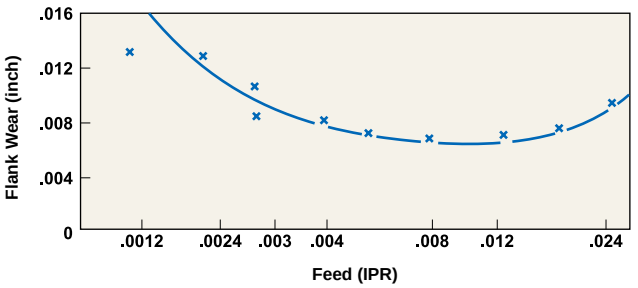
EFFECTS OF CUTTING CONDITIONS FOR TURNING

FEED

In cutting with a general holder, feed is the distance a holder moves per workpiece revolution. In milling, feed is the distance a machine table moves per cutter revolution divided by number of inserts. Thus, it is indicated as feed per tooth. Feed rate relates to finished surface roughness.

Effects of Feed

1. Decreasing feed rate results in flank wear and shortens tool life.
2. Increasing feed rate increases cutting temperature and flank wear. However, effects on the tool life is minimal compared to cutting speed.
3. Increasing feed rate improves machining efficiency.



Cutting Conditions Workpiece : AISI 4340 Grade : P10
Depth of Cut ap=.040(inch) Cutting Speed vc=660(SFM)
Cutting Time Tc=10min

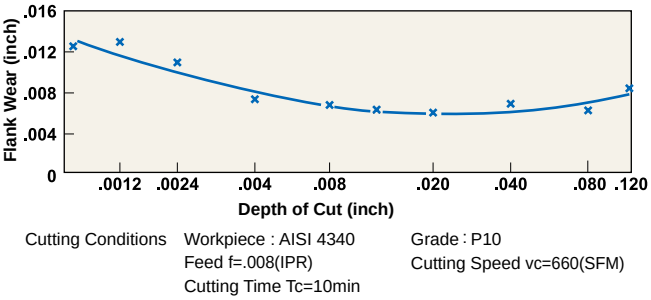
Feed and Flank Wear Relationship in Steel Turning

DEPTH OF CUT

Depth of cut is determined according to the required stock removal, shape of workpiece, power and rigidity of the machine and tool rigidity.

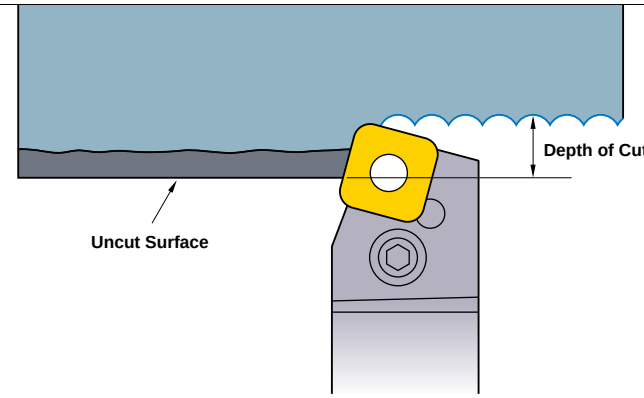
Effects of Depth of Cut

1. Changing depth of cut doesn't effect tool life greatly.
2. Small depths of cut result in friction when cutting the hardened layer of a workpiece. Thus tool life is shortened.
3. When cutting uncut or cast iron surfaces, the depth of cut needs to be increased as much as the machine power allows to avoid cutting impure hard layer with the tip of cutting edge which prevents chipping and abnormal wear.



Cutting Conditions Workpiece : AISI 4340 Grade : P10
Feed f=.008(IPR) Cutting Speed vc=660(SFM)
Cutting Time Tc=10min

Depth of Cut and Flank Wear Relationship in Steel Turning

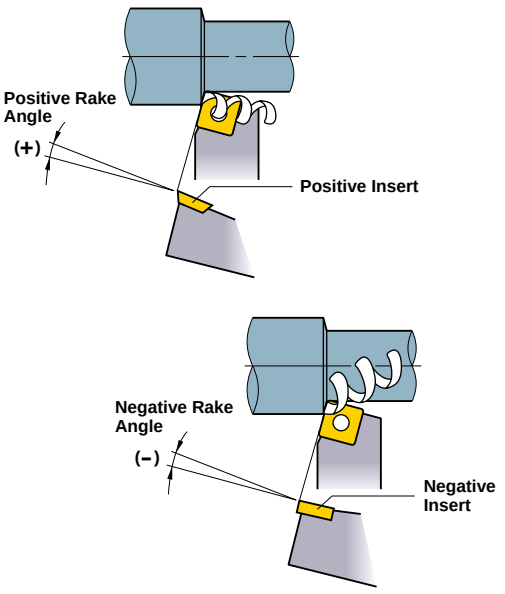


Roughing of Surface Layer that Includes Uncut Surface

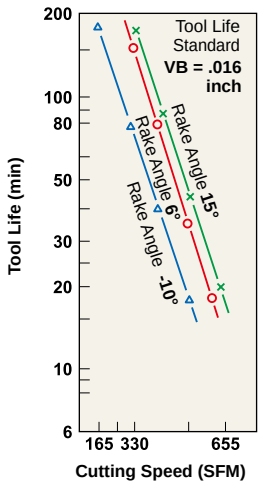
FUNCTION OF TOOL FEATURES FOR TURNING

RAKE ANGLE

Rake angle is a cutting edge angle that has large effects on cutting resistance, chip disposal, cutting temperature and tool life.

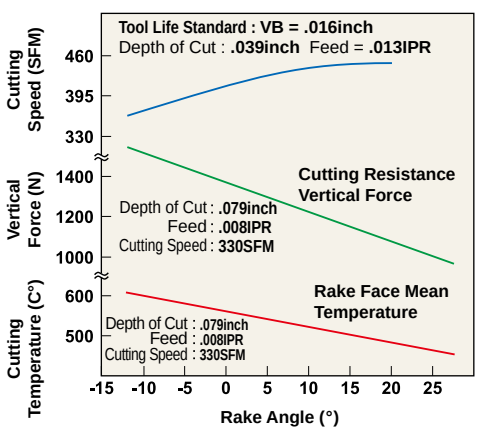


Chip Disposal and Rake Angle



Cutting Conditions
Grade : **P10**
Depth of Cut : **.039inch**
Feed : **.013IPR**
Workpiece : **Alloy steel**

Rake Angle and Tool Life



Cutting Conditions
Workpiece : **Alloy steel** Grade : **P10**
Dry Cutting

Effects of Rake Angle on Cutting Speed, Vertical Force, and Cutting Temperature

Effects of Rake Angle

1. Increasing rake angle in the positive (+) direction improves sharpness.
2. Increasing rake angle by 1° in the positive (+) direction decreases cutting power by about 1%.
3. Increasing rake angle in the positive (+) direction lowers cutting edge strength and in the negative (-) direction increases cutting resistance.

When to Increase Rake Angle in the Negative (-) Direction

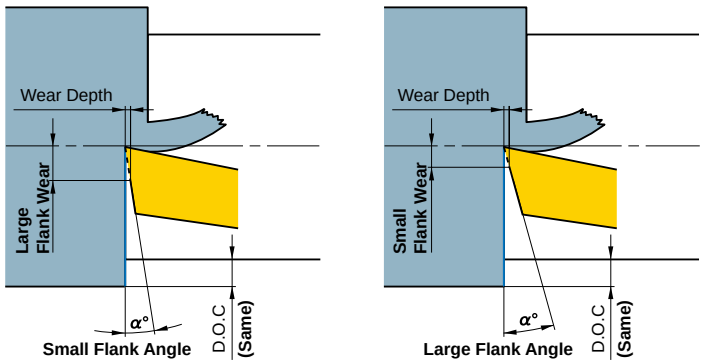
- ○ **Hard workpiece.**
- ○ **When cutting edge strength is required such as in interrupted cutting and uncut surface cutting.**

When to Increase Rake Angle in the Positive (+) Direction

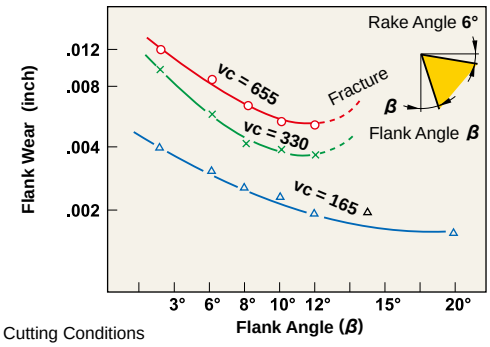
- ○ **Soft workpiece.**
- ○ **Workpiece is easily machined.**
- ○ **When workpiece or the machine have poor rigidity.**

FLANK ANGLE

Flank angle prevents friction between flank face and workpiece resulting in smooth feed.



Flank angle creates a space between tool and workpiece. Flank angle relates to flank wear.



Cutting Conditions
Workpiece : **Alloy steel (200HB)** Feed : **.013IPR**
Grade : **P20** Cutting Time : **20min**
Depth of Cut : **.039inch**

Flank Angle and Flank Wear Relationship

Effects of Flank Angle

1. Increasing flank angle decreases flank wear occurrence.
2. Increasing flank angle lowers cutting edge strength.

When to Decrease Flank Angle

- ○ **Hard workpieces.**
- ○ **When cutting edge strength is required.**

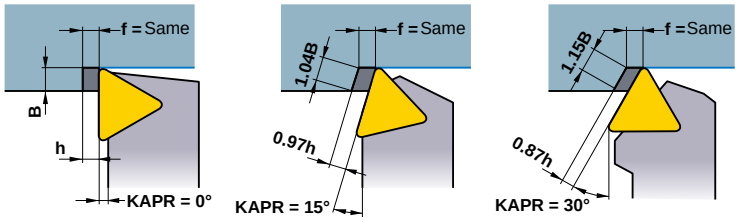
When to Increase Flank Angle

- ○ **Soft workpieces.**
- ○ **Workpieces suffer from work hardening easily.**

FUNCTION OF TOOL FEATURES FOR TURNING

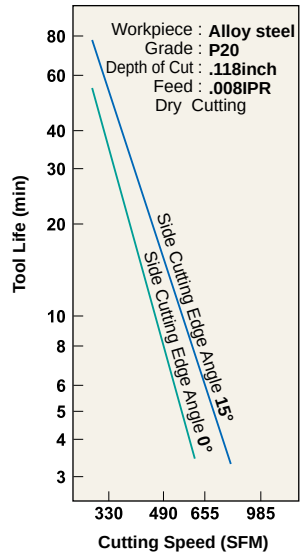
SIDE CUTTING EDGE ANGLE (LEAD ANGLE)

Side cutting edge angle lower impact load and effect feed force, back force, and chip thickness.



B : Chip Width
f : Feed
h : Chip Thickness
KAPR : Tool Cutting Edge Angle

Side Cutting Edge Angle and Chip Thickness

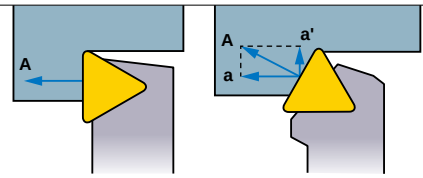


Side Cutting Edge and Tool Life

Effects of Side Cutting Edge Angle (Lead Angle)

1. At the same feed rate, increasing the side cutting edge angle increases the chip contact length and decreases chip thickness. As a result, the cutting force is dispersed on a longer cutting edge and tool life is prolonged. (Refer to the chart.)
2. Increasing the side cutting edge angle increases force a'. Thus, thin, long workpieces suffer from bending in some cases.
3. Increasing the side cutting edge angle decreases chip control.
4. Increasing the side cutting edge angle decreases the chip thickness and increases chip width. Thus, breaking chips is difficult.

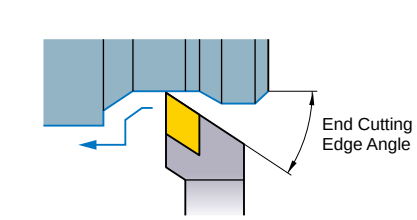
When to Decrease Lead Angle	When to Increase Lead Angle
○ **Finishing with small depth of cut.** ○ **Thin, long workpieces.** ○ **When the machine has poor rigidity.**	○ **Hard workpieces which produce high cutting temperature.** ○ **When roughing a large diameter workpiece.** ○ **When the machine has high rigidity.**



Receive force A. **Force A is divided into a and a'.**

END CUTTING EDGE ANGLE

End cutting edge angle prevents wear on tool and workpiece surface and is usually 5°– 15°.

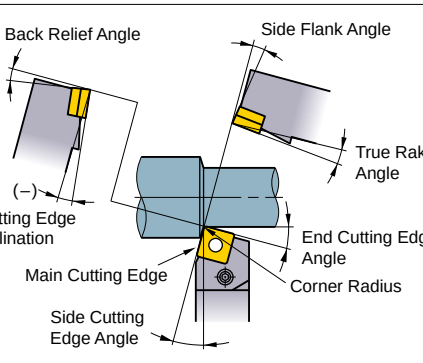


Effects of End Cutting Edge Angle

1. Decreasing the end cutting edge angle increases cutting edge strength, but it also increases cutting edge temperature.
2. Decreasing the end cutting edge angle increases the back force and can result in chattering and vibration while machining.
3. Small end cutting edge angle in roughing and large angle in finishing are recommended.

CUTTING EDGE INCLINATION

Cutting edge inclination indicates inclination of the rake face. In heavy cutting, the cutting edge receives extremely large shock at the beginning of cutting. Cutting edge inclination keeps the cutting edge from receiving this shock and prevents fracturing. 3°– 5° in turning and 10°– 15° in milling are recommended.

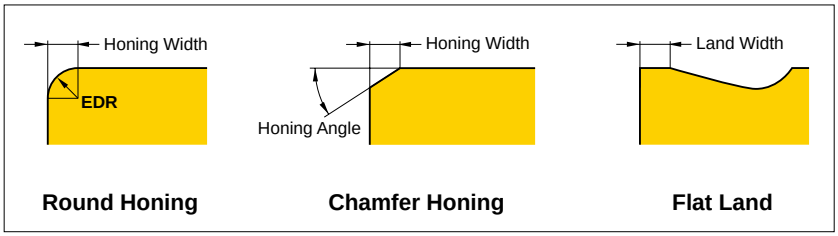


Effects of Cutting Edge Inclination

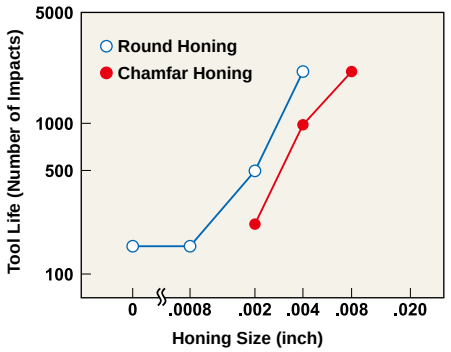
1. Negative (-) cutting edge inclination disposes chips in the workpiece direction, and positive (+) disposes chips in the opposite direction.
2. Negative (-) cutting edge inclination increases cutting edge strength, but it also increases back force of cutting resistance. Thus, chattering easily occurs.

HONING AND LAND

Honing and land are cutting edge shapes that maintain cutting edge strength.
Honing can be round or chamfer type. The optimal honing or / and land width is approximately 1/2 of the feed.
Land is the narrow flat area on the rake or flank face.

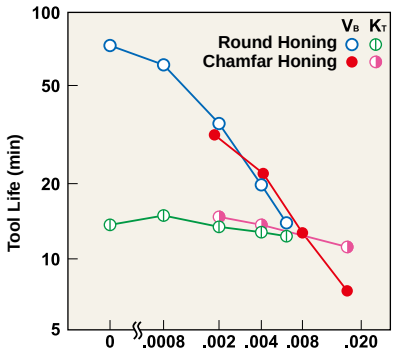


Round Honing **Chamfer Honing** **Flat Land**



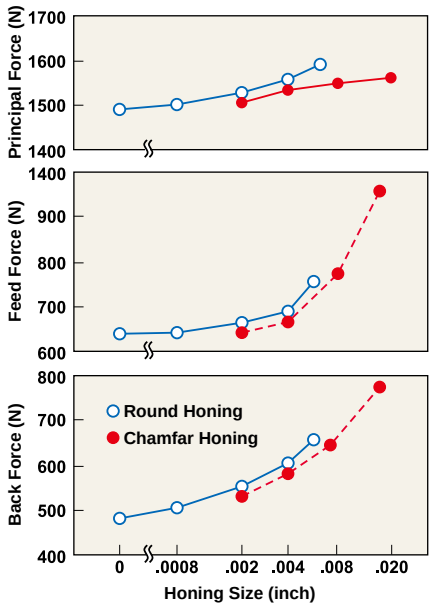
Workpiece : **Alloy steel (280HB)**
Grade : **P10**
Cutting Conditions : **vc=655SFM ap=.059inch f=.013IPR**

Honing Size and Tool Life Due to Fracturing



Workpiece : **Alloy steel (220HB)**
Grade : **P10**
Cutting Conditions : **vc=525SFM ap=.059inch f=.018IPR**

Honing Size and Tool Life Due to Wear



Workpiece : **Alloy steel (220HB)**
Grade : **P10**
Cutting Conditions : **vc=333SFM ap=.059inch f=.017IPR**

Honing Size and Cutting Resistance

Effects of Honing

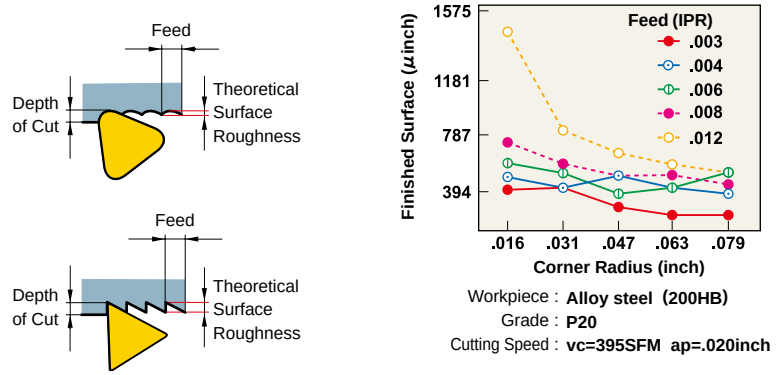
1.Enlarging the honing increases cutting edge strength, and reduces fracturing.
2.Enlarging the honing increases flank wear occurrence. Honing size doesn't affect rake wear.
3.Enlarging the honing increases cutting resistance and chattering.

When to Decrease Honing Size	When to Increase Honing Size
○ When finishing with small depth of cut and small feed. ○ Soft workpieces. ○ When the workpiece and the machine have poor rigidity.	○ Hard workpieces. ○ When the cutting edge strength is required such as for uncut surface cutting and interrupted cutting. ○ When the machine has high rigidity.

FUNCTION OF TOOL FEATURES FOR TURNING

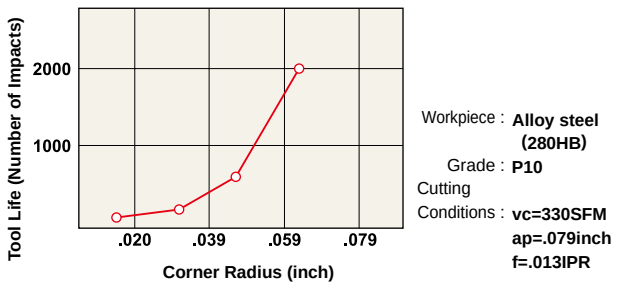
CORNER RADIUS

Corner radius effects the cutting edge strength and finished surface. In general, a corner radius 2 – 3 times the feed is recommended.



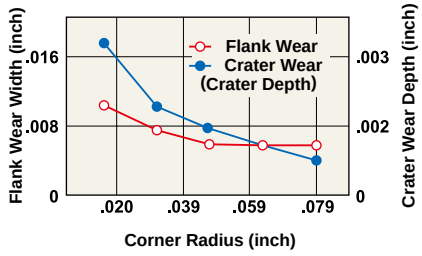
Workpiece : **Alloy steel (200HB)**
Grade : **P20**
Cutting Speed : **vc=395SFM ap=.020inch**

Corner Radius and Finished Surface



Workpiece : **Alloy steel (280HB)**
Grade : **P10**
Cutting Conditions : **vc=330SFM ap=.079inch f=.013IPR**

Corner Radius Size and Tool Life Due to Fracturing



Workpiece : **Alloy steel (200HB)**
Grade : **P10**
Cutting Conditions : **vc=460SFM ap=.079inch f=.008IPR Tc=10min**

Corner Radius Size and Tool Wear

Effects of Corner Radius

1. Increasing the corner radius improves the surface finish.
2. Increasing the corner radius improves cutting edge strength.
3. Increasing the corner radius too much increases the cutting resistance and causes chattering.
4. Increasing the corner radius decreases flank and rake wear.
5. Increasing the corner radius too much results in poor chip control.

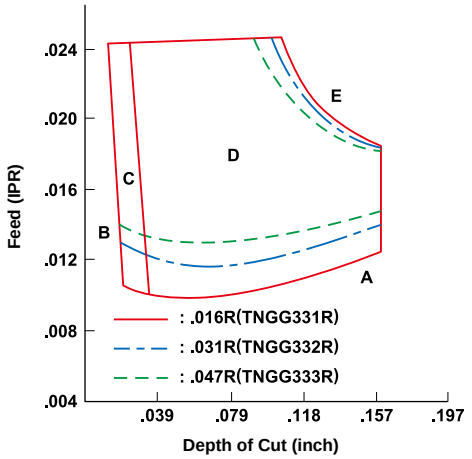
When to Decrease Corner Radius

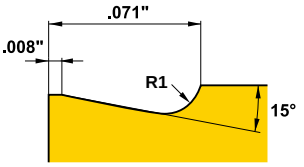
- ○ **Finishing with small depth of cut.**
- ○ **Thin, long workpieces.**
- ○ **When the machine has poor rigidity.**

When to Increase Corner Radius

- ○ **When the cutting edge strength is required such as in interrupted cutting and uncut surface cutting.**
- ○ **When roughing a workpiece with large diameter.**
- ○ **When the machine has high rigidity.**

Corner Radius and Chip Control Range





Workpiece : **AISI 1045 (180HB)**
Insert : **TNGG331R TNGG332R TNGG333R (P10)**
(Side Cutting Edge angle 3°)
Cutting Speed : **vc=330SFM**
Dry Cutting

(Note) Please refer to page N004 for chip shapes (A, B, C, D, E).

FORMULAS FOR CUTTING

CUTTING SPEED (vc)

$$vc = \frac{\pi \cdot Dm \cdot n}{12} (SFM)$$

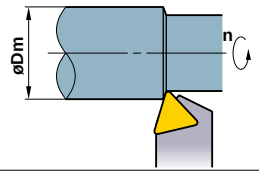
vc (SFM) : Cutting Speed
Dm (inch) : Workpiece Diameter
π (3.14) : Pi
n (min^{-1}) : Main Axis Spindle Speed

(Problem) What is the cutting speed when the main axis spindle speed is 700 min^{-1} and external diameter is Φ2" ?

(Answer) Substitute π=3.14, Dm=2, n=700 into the formula.

$$vc = \frac{\pi \cdot Dm \cdot n}{12} = \frac{3.14 \times 2 \times 700}{12} = 365SFM$$

The answer is 365SFM.



FEED (f)

$$f = \frac{l}{n} (IPR)$$

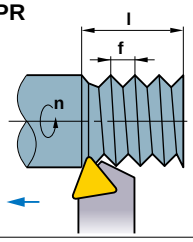
f (IPR) : Feed per Revolution
l (inch/min) : Cutting Length per Min.
n (min^{-1}) : Main Axis Spindle Speed

(Problem) What is the feed per revolution when the main axis spindle speed is 500min^{-1} and cutting length per minute is 4.72 inch/min ?

(Answer) Substitute n=500, l=4.72 into the formula.

$$f = \frac{l}{n} = \frac{4.72}{500} = .009IPR$$

The answer is .009IPR.



CUTTING TIME (Tc)

$$Tc = \frac{lm}{l} (min)$$

Tc (min) : Cutting Time
lm (inch) : Workpiece Length
l (inch/min) : Cutting Length per Min.

(Problem) What is the cutting time when 4 inch workpiece is machined at 1000min^{-1} with feed= .008IPR ?

(Answer) First, calculate the cutting length per min. from the feed and spindle speed.

$$l = f \times n = .008 \times 1000 = 8inch/min$$

Substitute the answer above into the formula.

$$Tc = \frac{lm}{l} = \frac{4}{8} = 0.5min$$

0.5×60=30 (sec.)
The answer is 30 sec.

THEORETICAL FINISHED SURFACE ROUGHNESS (h)

$$h = \frac{f^2}{8RE} \times 1000^2 (\mu inch)$$

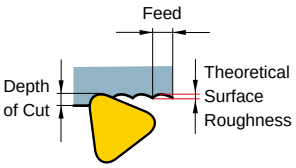
h (μinch) : Finished Surface Roughness
f (IPR) : Feed per Revolution
RE (inch) : Insert Corner Radius

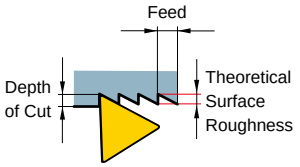
(Problem) What is the theoretical finished surface roughness when the insert corner radius is .031inch and feed is .008IPR ?

(Answer) Substitute f= .008 IPR, RE= .031 into the formula.

$$h = \frac{(.008)^2}{8 \times .031} \times 1000^2 = 258 \ \mu inch$$

The answer is 258μinch.





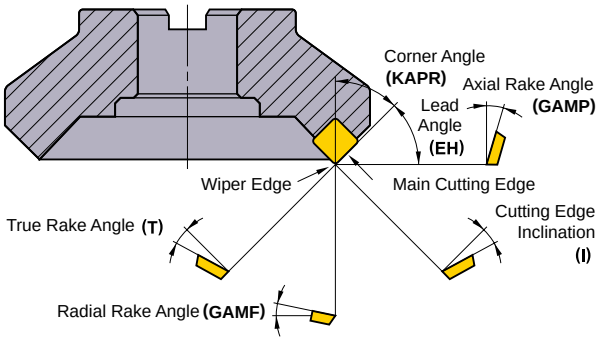
TECHNICAL DATA

TROUBLE SHOOTING FOR MILLING

Trouble / Factors / Solutions			Insert Grade Selection				Cutting Conditions						Style and Design of the Tool										Machine and Installation of Tool		
			Select a Harder Grade	Select a Tougher Grade	Select a Grade with Better Thermal Shock Resistance	Select a Grade with Better Adhesion Resistance	Cutting Speed	Feed Rate	Depth of Cut	Engage Angle	Cutting Fluids		Rake Angle	Corner Angle	Honing Strengthens the Cutting Edge	Cutter Diameter	Decrease the Number of Teeth	Wider Chip Pocket	Use of a Wiper Insert	Run-out Accuracy	Improve Cutter Rigidity		Installation of the Tool and Workpiece	Shorten Tool Overhang	Machine with Inadequate Horsepower and Rigidity
							Up ↗ Down ↘			↗ Up ↘	Do Not Use Water-soluble Cutting Fluid	Determine Dry or Wet Cutting	Up ↗ Down ↘												
Short Tool LIfe	Rapid insert wear	Improper tool grade	●																						
		Improper cutting edge geometry											↗●	↗●	●↘					●					
		Improper cutting conditions					●↘					●Wet													
	Chipping and fracturing of cutting edge	Improper tool grade		●																					
		Improper cutting conditions						●↘	●↘																
		Lack of cutting edge strength													↗●										
		Thermal cracking occurs			●		●↘	●↘	●↘		●	●Dry													
		Built-up edge occurs				●	↗●	↗●			●	●Wet													
		Lack of rigidity																			●		●	●	●
Poor Surface Finish	Worsening surface roughness	Improper cutting conditions	●				●↘	●↘	●↘																
		Welding occurs				●	↗●				●	●Wet	↗●		●↘										
		Poor run-out accuracy																	●	●					
		Vibration occurs					●↘	●↘	●↘	↗●			↗●		●↘		●				●		●	●	●
	Not parallel or irregular surface	Workpiece bending						●↘	●↘				↗●	●↘	●↘		●						●		
		Tool clearance																			●		●	●	●
		Large back force											↗●	●↘	●↘		●								
Burr / Chipping	Burr	Chip thickness is too large					↗●	●↘	●↘																
		Cutter diameter is too large								↗●						●↘									
		Poor sharpness											↗●		●↘										
		A large corner angle												●↘											
	Chipping	Improper cutting conditions						●↘	●↘																
		Poor sharpness											↗●		●↘										
		Corner angle is too small												↗●											
		Vibration occurs					●↘	●↘	●↘	↗●			↗●		●↘		●				●		●	●	●
Chip Control	Poor chip disposal, chip jamming and chip packing	Welding occurs					↗●																		
		Chip thickness is too thin					↗●	↗●																	
		Cutter diameter is too small														●↘									
		Poor chip disposal									●	●Wet					●	●							

FUNCTION OF TOOL FEATURES FOR FACE MILLING

FUNCTION OF EACH CUTTING EDGE ANGLE IN FACE MILLING

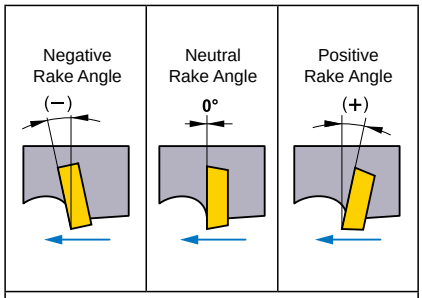


Each Cutting Edge Angle in Face Milling

Type of Angle	Symbol	Function	Effect
Axial Rake Angle	GAMF	Determines chip disposal direction.	Positive : Excellent machinability.
Radial Rake Angle	GAMP	Determines sharpness.	Negative : Excellent chip disposal.
Corner Angle	KAPR	Determines chip thickness.	Large : Thin chips and small cutting impact. Large back force.
True Rake Angle	T	Determines actual sharpness.	Positive(large) : Excellent machinability. Minimal welding. Negative(large) : Poor machinability. Strong cutting edge.
Cutting Edge Inclination	I	Determines chip disposal direction.	Positive (large) : Excellent chip disposal. Low cutting edge strength.

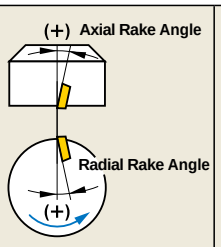
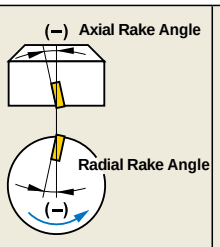
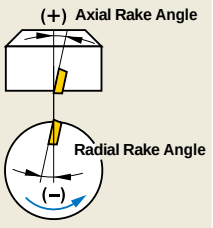
STANDARD INSERTS

Positive and Negative Rake Angle

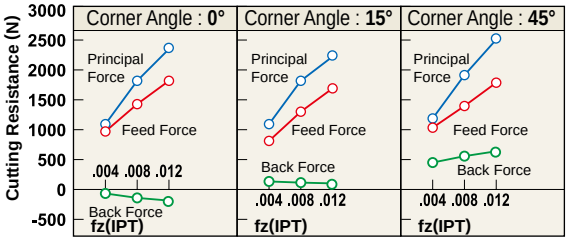


- Insert shape whose cutting edge precedes is a positive rake angle.
- Insert shape whose cutting edge follows is a negative rake angle.

Standard Cutting Edge Shape

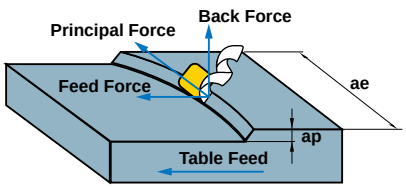
Standard Cutting Edge Combinations		 Double Positive (DP Edge Type)	 Double Negative (DN Edge Type)	 Negative/Positive (NP Edge Type)
Axial Rake Angle (GAMP)		Positive (+)	Negative (−)	Positive (+)
Radial Rake Angel (GAMF)		Positive (+)	Negative (−)	Negative (−)
Insert Used		Positive Insert (One Sided Use)	Negative Insert (Double Sided Use)	Positive Insert (One Sided Use)
Work Material	Steel	●	–	●
	Cast Iron	–	●	●
	Aluminum Alloy	●	–	–
	Difficult-to-Cut Material	●	–	●

CORNER ANGLE (KAPR) AND CUTTING RESISTANCE



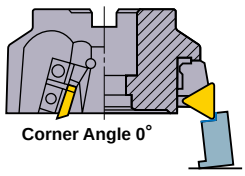
Workpiece : **Alloy Steel (281HB)**
Tool : **ø4" Single Insert**
Cutting Conditions : **vc=410SFM ap=.157inch ae=4.33inch**

Cutting Resistance Comparison between Different Corner Angles

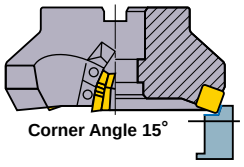


Three Cutting Resistance Forces in Milling

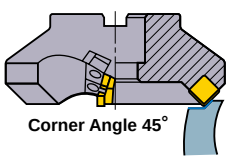
Corner Angle 0° — Back force is in the minus direction. Lifts the workpiece when workpiece clamp rigidity is low.



Corner Angle 15° — Corner angle 15° is recommended for face milling of workpieces with low rigidity such as thin workpieces.



Corner Angle 45° — The largest back force. Bends thin workpieces and lowers cutting accuracy.
∗ Prevents workpiece edge chipping in cast iron cutting.



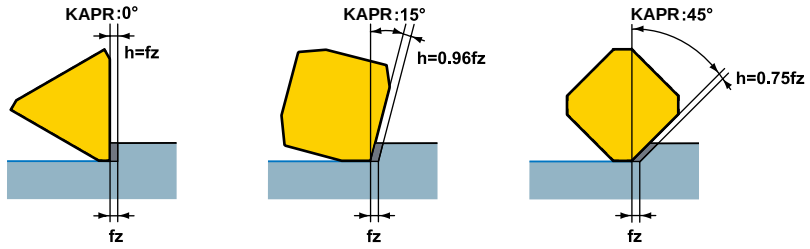
∗ Principal force: Force is in the opposite direction of face milling rotation.
∗ Back force: Force that pushes in the axial direction.
∗ Feed Force: Force is in the feed direction and is caused by table feed.

FUNCTION OF TOOL FEATURES FOR FACE MILLING

CORNER ANGLE AND TOOL LIFE

Corner Angle and Chip Thickness

When the depth of cut and feed per tooth, fz, are fixed, the larger the corner angle (KAPR) is, then the thinner the chip thickness (h) becomes (for a 45° KAPR, it is approx. 75% that of a 0° KAPR). This can be seen in below. Therefore as the KAPR increases, the cutting resistance decreases resulting in longer tool life. Note however, if the chip thickness is too large then the cutting resistance can increase leading to vibrations and shortened tool life.



Effects on chip thickness due to the variation of corner angles

Corner Angle and Crater Wear

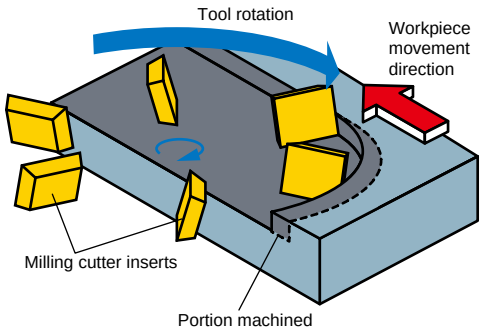
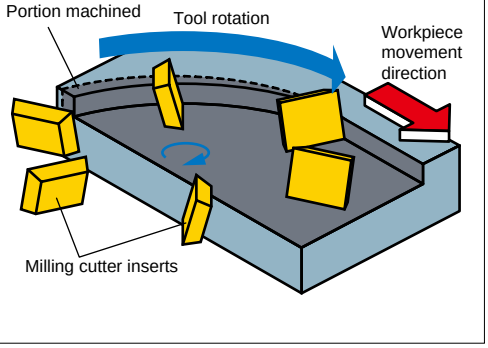
Below shows wear patterns for different corner angles. When comparing crater wear for 0° and 45° corner angles, it can be clearly seen that the crater wear for 0° corner angle is larger. This is because if the chip thickness is relatively large, the cutting resistance increases and so promotes crater wear. As the crater wear develops then cutting edge strength will reduce and lead to fracturing.

	0° Corner Angle	**15°** Corner Angle	**45°** Corner Angle
vc=330SFM Tc=69min			
vc=410SFM Tc=55min			
vc=525SFM Tc=31min			

Workpiece : **AISI 4340 (287HB)**
Tool : **DC=4.92inch**
Insert : **M20**
Cutting Conditions : **ap=.118inch**
ae=4.33inch
fz=.008IPT
Coolant : Dry Cutting

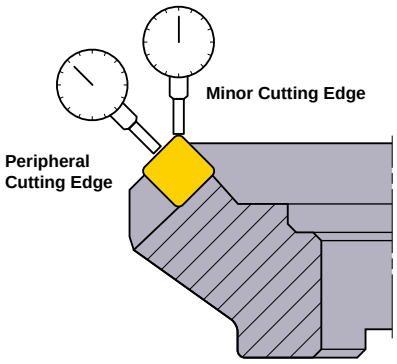
UP CUT AND DOWN CUT MILLING

Which method to be used will depend on the machine and the face mill cutter that has been selected. Generally down cut machining offers longer tool life than up cut milling.

Up Cut Milling	**Down Cut Milling**
	

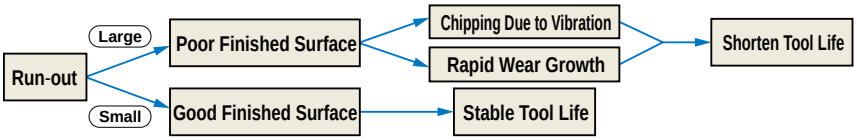
FINISHED SURFACE

Cutting Edge Run-out Accuracy

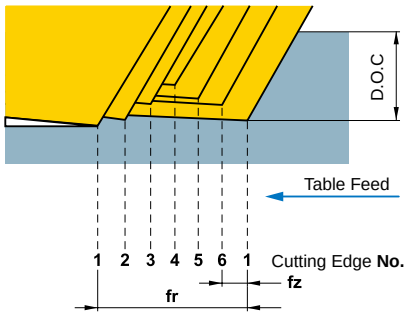


Cutting Edge Run-out and Accuracy in Face Milling

Cutting edge run-out accuracy of indexable inserts on the cutter body greatly affects the surface finish and tool life.



Improve Finished Surface Roughness

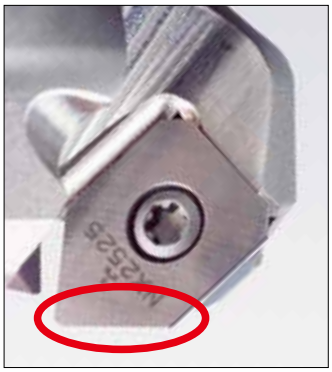


fz : Feed per Tooth
fr : Feed per Revolution

Sub Cutting Edge Run-out and Finished Surface

Usually the minor cutting edges are set parallel to the face of a milling cutter and theoretically the finished surface accuracy should be maintained, even if run-out accuracy is poor.

Actual Problems	Countermeasure
· Cutting edge run-out. · Minor cutting edge inclination. · Cutter body accuracy. · Spare parts accuracy. · Welding, vibration, chattering.	**Wiper Insert** *Machine a surface that has already been machined by normal insert in order to produce smooth finished surface.



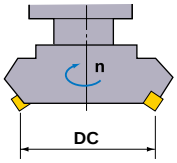
· Replace one normal insert with wiper insert.
· Wiper inserts are set to protrude by .0012 — .004 inch from the standard inserts.
Value depends on the cutting edge and insert combination.

FORMULAS FOR MILLING

CUTTING SPEED (vc)

$$vc = \frac{\pi \cdot DC \cdot n}{12} \text{ (SFM)}$$

vc (SFM) : Cutting Speed
DC (inch): Cutter Diameter
π (3.14) : Pi
n (min^{-1}) : Main Axis Spindle Speed



(Problem) What is the cutting speed when main axis spindle speed is 350min^{-1} and cutter diameter is ϕ5" ?

(Answer) Substitute π 3.14, DC=5", n=350 into the formula.

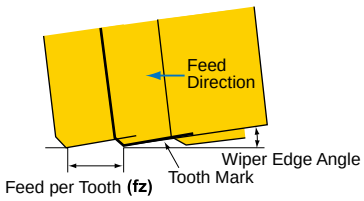
$$vc = \frac{\pi \cdot DC \cdot n}{12} = \frac{3.14 \times 5" \times 350}{12} = 457.9 \text{ SFM}$$

The answer is 457.9SFM.

FEED PER TOOTH (fz)

$$fz = \frac{vf}{z \cdot n} \text{ (IPT)}$$

fz (IPT) : Feed per Tooth **z** : Insert Number
vf (inch/min) : Table Feed per Min.
n (min^{-1}) : Main Axis Spindle Speed (Feed per Revolution fr=z x fz)



(Problem) What is the feed per tooth when the main axis spindle speed is 500min^{-1}, insert number is 10, and table feed is 20inch/min ?

(Answer) Substitute the above figures into the formula.

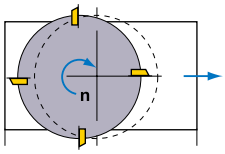
$$fz = \frac{Vf}{z \times n} = \frac{20}{10 \times 500} = .004 \text{ IPT}$$

The answer is .004IPT.

TABLE FEED (vf)

$$vf = fz \cdot z \cdot n \text{ (inch/min)}$$

vf (inch/min) : Table Feed per Min.
fz (IPT) : Feed per Tooth **z** : Insert Number
n (min^{-1}) : Main Axis Spindle Speed



(Problem) What is the table feed when feed per tooth is .004IPT, with 10 inserts and main axis spindle speed is 500min^{-1}?

(Answer) Substitute the above figures into the formula.

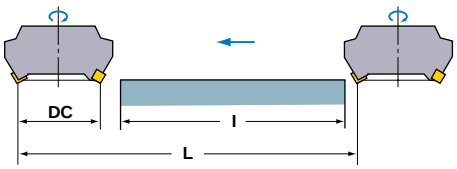
vf = fz x z x n = .004IPT x 10 x 500 = 20inch/min

The answer is 20inch/min.

CUTTING TIME (Tc)

$$Tc = \frac{L}{vf} \text{ (min)}$$

Tc (min) : Cutting Time
vf (inch/min) : Table Feed per Min.
L (inch) : Total Table Feed Length (Workpiece Length(l)+Cutter Diameter(DC))



(Problem) What is the cutting time required for finishing 4" width and 12" length surface of a cast iron (GG20) block when cutter diameter is ϕ8", the number of inserts is 16, the cutting speed is 410SFM, and feed per tooth is .01". (spindle speed is 200min^{-1})

(Answer) Calculate table feed per min vf=.01 x 16 x 200=32inch/min
Calculate total table feed length. L=12+8=20inch
Substitute the above answers into the formula.

$$Tc = \frac{20}{32} = 0.625 \text{ (min)}$$

0.625 x 60 = 37.5 (sec.) The answer is 37.5 sec.

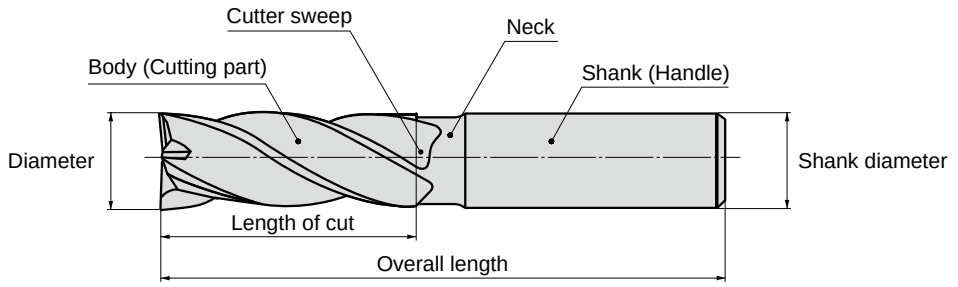
TROUBLE SHOOTING FOR END MILLING

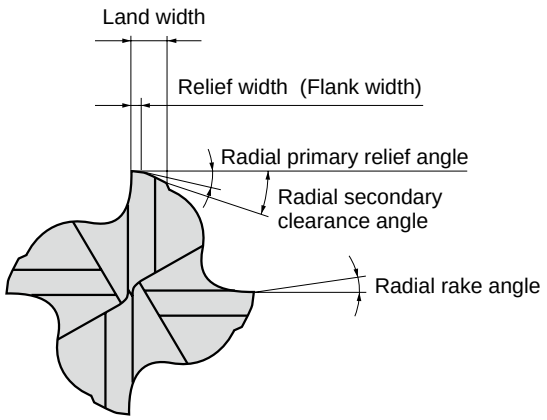
Trouble	Factors	Solutions	Insert Grade Selection	Cutting Conditions									Style and Design of the Tool						Machine and Installation of Tool					
			Coated Tool	Cutting Speed (Up ↗ / Down ↘)	Feed Rate (Up ↗ / Down ↘)	Depth of Cut (Up ↗ / Down ↘)	Decrease Pick Feed Rate	Down Cut	Air Blow	Cutting Fluids: Increase Coolant Quantity	Cutting Fluids: Do Not Use Water-soluble Cutting Fluid	Cutting Fluids: Determine Dry or Wet Cutting	Helix Angle (Up ↗ / Down ↘)	Number of Flutes (Up ↗ / Down ↘)	Concavity Angle of End Cutting Edge (Up ↗ / Down ↘)	Tool Diameter (Up ↗ / Down ↘)	Improve End Mill Rigidity	Wider Chip Pocket	Shorten Tool Overhang	Tool Installation Accuracy	Spindle Collet Run-out Accuracy	Collet Inspection and Exchange	Increase Chuck Clamping Power	Machine Stability, Rigidity
Short Tool Life	Large wear at the peripheral cutting edge	Non-coated insert is used	●																					
		Not enough flutes												↗●										
		Improper cutting conditions		●↘							●													
		Up cut milling						Down Cut																
	Chipping	Improper cutting conditions																						
		Fragile cutting edge															●							
		Insufficient clamping force																				●	●	
		Poor clamping rigidity																	●	●	●	●	●	●
	Breakage during cutting	Improper cutting conditions				●↘																		
		Poor end mill rigidity														↗●	●							
		Overhang longer than necessary				●↘													●					
		Chip packing								●								●						
Poor Surface Finish	Vibration during cutting	Improper cutting conditions		●↘	●↘																			
		Poor end mill rigidity											↗●	↗●		↗●	●							
		Poor clamping rigidity																	●	●	●	●	●	●
	Poor wall surface roughness	Large cutting edge wear	●																					
		Improper cutting conditions		●↘		●↘																		
		Chip jamming							●	●		● Wet												
	Poor bottom surface roughness	The end cutting edge does not have a concave angle			●↘	●↘									↗●									
		Large pick feed					●																	
	Out of vertical	Large cutting edge wear	●																					
		Improper cutting conditions			●↘	●↘																		
		Poor end mill rigidity											↗●	↗●		↗●	●							
	Poor surface finish accuracy	Improper cutting conditions		●↘	●↘	●↘																		
		Poor clamping rigidity																	●	●	●	●	●	●
Burr / Chipping / Burrs	Burr, workpiece chipping	Improper cutting conditions			●↘	●↘																		
		Large helix angle											↗●											
	Quick burr formation	Notch wear occurs	●																					
		Improper cutting conditions		●↘	↗●																			
Chip Control	Chip packing	Metal removal too large			●↘	●↘																		
		Lack of flute chip space												●↘				●						

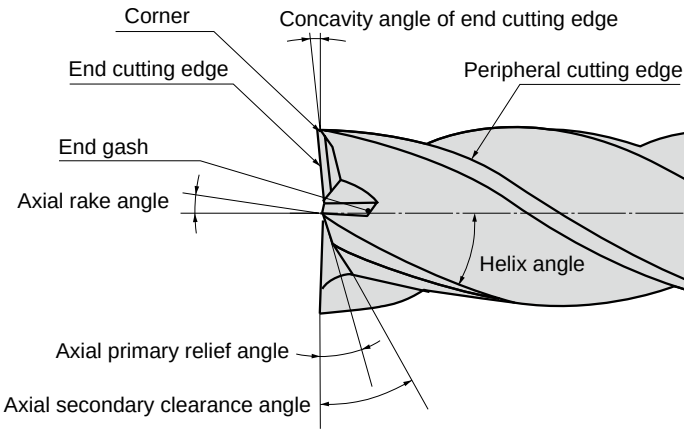
TECHNICAL DATA

END MILL FEATURES AND SPECIFICATION

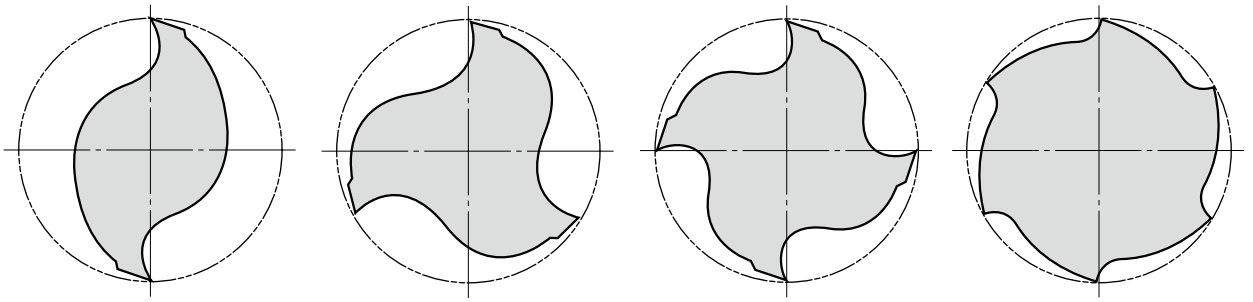
NOMENCLATURE







COMPARISON OF SECTIONAL AREA OF CHIP POCKET



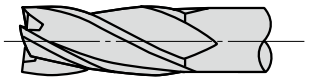
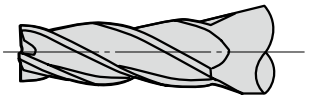
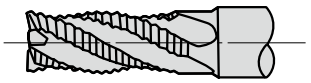
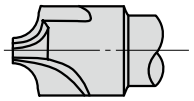
2-flutes 50% | 3-flutes 45% | 4-flutes 40% | 6-flutes 20%

CHARACTERISTICS AND APPLICATIONS OF DIFFERENT-NUMBER-OF-FLUTE END MILLS

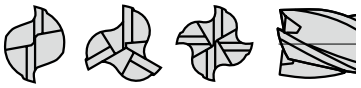
		2-flutes	3-flutes	4-flutes	6-flutes
Feature	Advantage	Effective chip disposal. Horizontal feed milling possible.	Effective chip disposal. Horizontal feed milling possible.	High rigidity.	High rigidity. Superior cutting edge durability.
	Fault	Low rigidity.	Diameter is not measured easily.	Chip disposal is poor.	Chip disposal is poor.
Usage		Various cutting modes including slotting, shoulder milling and drilling.	Slotting, shoulder milling Heavy cutting, finishing	Shallow slotting, shoulder milling Finishing	Machining hardened steels. Shallow slotting, shoulder milling.

END MILL TYPE AND GEOMETRY

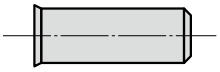
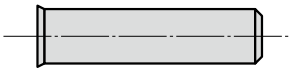
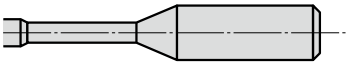
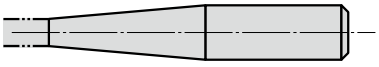
PERIPHERAL CUTTING EDGE

Type	Shape	Feature
Ordinary Flute		Regular flute geometry as shown is most commonly used for roughing and finishing of side milling, slotting and shoulder milling.
Tapered Flute		A tapered flute geometry is used for special applications such as mould drafts and for applying taper angles after conventional straight edged milling.
Roughing Flute		Roughing type geometry has a wave like edge form and breaks the material into small chips. Additionally the cutting resistance is low enabling high feed rates when roughing. The inside face of the flute is suitable for regrinding.
Formed Flute		Special form geometry as shown is used for producing corner radii on components. There are an infinite number of different geometry's that can be manufactured using such style of cutters.

END CUTTING EDGE

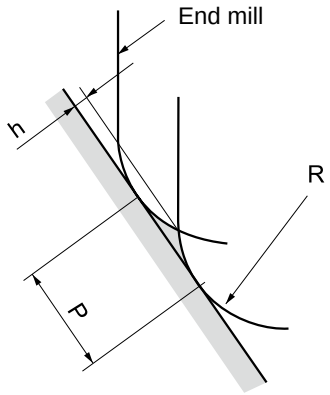
Type	Shape	Feature
Square End (With Center Hole)		Generally used for side milling, slotting and shoulder milling. Plunge cutting is not possible due to the center hole that is used to ensure accurate grinding and regrinding of the tool.
Square End (Center Cut)		Generally used for side milling, slotting and shoulder milling. Plunge cutting is possible and greater plunge cutting efficiency is obtained when using fewer flutes. Regrinding on the flank face can be done.
Ball End		Geometry completely suited for curved surface milling. At the extreme end point the chip pocket is very small leading to inefficient chip evacuation.
Corner Radius End		Used for radius profiling and corner radius milling. When pick feed milling an end mill with a large diameter and small corner radius can be efficiently used.

SHANK AND NECK PARTS

Type	Shape	Feature
Standard (Straight Shank)		Most widely used type.
Long Shank		Long shank type for deep pocket and shoulder applications.
Long Neck		Long neck geometry can be used for deep slotting and is also suitable for boring.
Taper Neck		Long taper neck features are best utilized on deep slotting and mold draft applications.

PITCH SELECTION OF PICK FEED

PICK FEED MILLING (CONTOURING) WITH BALL NOSE END MILLS, END MILLS WITH CORNER RADIUS



$$h=R \cdot \left[1-\cos\left\{\sin^{-1}\left(\frac{P}{2R}\right)\right\}\right]$$

R : Radius of Ball Nose(PRFRAD), Corner Radius(RE)

P : Pick Feed

h : Cusp Height

CORNER R OF END MILLS AND CUSP HEIGHT BY PICK FEED

Unit : inch

P / R	Pitch of Pick Feed (P)									
	.004	.008	.012	.016	.020	.024	.028	.031	.035	.039
0.5	.0001	.0004	.0009	.0017	.0026	.0039	—	—	—	—
1	.00004	.0002	.0004	.0008	.0016	.0018	.0025	.0033	.0042	—
1.5	.00004	.0001	.0003	.0005	.0008	.0012	.0016	.0021	.0027	.0034
2	.00004	.0001	.0002	.0004	.0006	.0009	.0012	.0016	.0020	.0025
2.5	.00004	.00007	.0002	.0003	.0005	.0007	.0010	.0013	.0016	.0020
3		.00007	.0002	.0003	.0004	.0006	.0008	.0011	.0013	.0017
4		.00004	.0001	.0002	.0003	.0004	.0006	.0008	.0010	.0012
5		.00004	.00007	.0002	.0002	.0004	.0005	.0006	.0008	.0010
6		.00004	.00007	.0001	.0002	.0003	.0004	.0005	.0007	.0008
8			.00004	.0001	.0002	.0002	.0003	.0004	.0005	.0006
10			.00004	.00007	.0001	.0002	.0002	.0003	.0004	.0005
12.5			.00004	.00007	.0001	.0002	.0002	.0002	.0003	.0004

P / R	Pitch of Pick Feed (P)									
	.043	.047	.051	.055	.059	.063	.067	.071	.075	.079
0.5	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—
1.5	.0041	—	—	—	—	—	—	—	—	—
2	.0030	.0036	.0043	—	—	—	—	—	—	—
2.5	.0024	.0029	.0034	.0039	—	—	—	—	—	—
3	.0020	.0024	.0028	.0033	.0037	.0043	—	—	—	—
4	.0015	.0018	.0021	.0024	.0028	.0032	.0036	.0041	—	—
5	.0012	.0014	.0017	.0019	.0022	.0025	.0029	.0032	.0036	.0040
6	.0010	.0012	.0014	.0016	.0019	.0021	.0024	.0027	.0030	.0033
8	.0007	.0009	.0010	.0012	.0014	.0016	.0018	.0020	.0022	.0025
10	.0006	.0007	.0008	.0010	.0011	.0013	.0014	.0016	.0018	.0020
12.5	.0005	.0006	.0007	.0008	.0009	.0010	.0011	.0013	.0014	.0016

TROUBLE SHOOTING FOR DRILLING

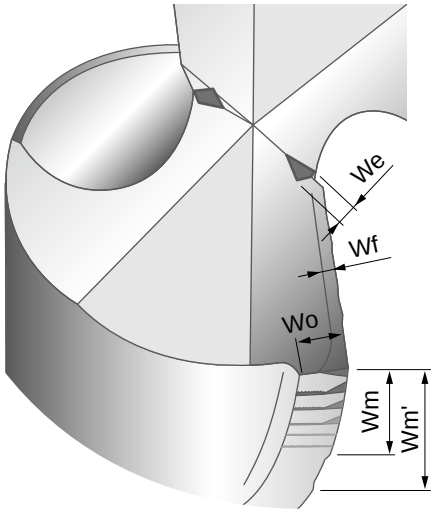
Trouble		Factors	Solutions: Cutting Conditions — Cutting Speed (Up ↗ / Down ↘)	Feed Rate (Up ↗ / Down ↘)	Lower the Feed at Initial Entry	Lower the Feed when Exiting	Step Feed	Increase the Accuracy and the Depth of the Pre-hole	Cutting Fluids — Increase Oil Ratio	Cutting Fluids — Increase Volume	Cutting Fluids — Increase Coolant Pressure	Style and Design of the Tool — Chisel Width (Large ↗ / Small ↘)	Honing Width (Large ↗ / Small ↘)	Core Thickness (Large ↗ / Small ↘)	Shorten the Flute Length	Decrease the Lip Height	Use a Drill with Coolant Holes	Change to a Drill with X Type Thinning	Machine and Installation of Tool — Tool Installation Accuracy	Shorten Tool Overhang	Flatten the Workpiece Face	Workpiece Installation Accuracy	Machine Stability, Rigidity
Short Tool Life	Drill breakage	Lack of drill rigidity												● ↗	●								
		Improper cutting conditions		● ↘																			
		Large deflection of the tool holder																	●				●
		Workpiece face is inclined																			●		
	Large wear at the peripheral cutting edge	Improper cutting conditions	● ↘																				
		Increase in temp. at cutting point							●	●							●						
		Poor run-out accuracy																	●				
	Chipping of the peripheral cutting edge	Improper cutting conditions		● ↘			●																
		Large deflection of the tool holder																	●				●
		Chattering, vibration											● ↘							●		●	●
	Chisel edge chipping	The chisel edge width is too large										● ↘											
		Poor entry			●																		
		Chattering, vibration											● ↘							●		●	●
Poor Hole Accuracy	Hole diameter increases	Lack of drill rigidity												● ↗	●								
		Improper drill geometry														●							
	Hole diameter becomes smaller	Increase in temp. at cutting point							●	●							●						
		Improper cutting conditions	● ↘																				
		Improper drill geometry														●							
	Poor straightness	Lack of drill rigidity												● ↗	●								
		Large deflection of the tool holder																	●				●
		Poor guiding properties						●															
	Poor hole positioning accuracy, roundness and surface finish	Lack of drill rigidity												● ↗	●								
		Poor entry																●					
		Improper cutting conditions			●																		
		Large deflection of the tool holder																	●				●
Burr	Burrs at the hole exit	Improper drill geometry											● ↘										
		Improper cutting conditions				●																	
Chip Control	Long chips	Improper cutting conditions		● ↗				●															
		Poor chip disposal								●	●			● ↘			●						
	Chip packing	Improper cutting conditions	● ↘	● ↘				●															
		Poor chip disposal								●	●			● ↘			●						

TECHNICAL DATA

DRILL WEAR CONDITION AND CUTTING EDGE DAMAGE

DRILL WEAR CONDITION

The diagram below shows a simple drawing depicting the wear of a drill's cutting edge. The generation and the amount of wear differ according to the workpiece materials and cutting conditions used. But generally, the peripheral wear is largest and determines a drill tool life. When regrinding, the flank wear at the point needs to be ground away completely. Therefore, if there is large wear, more material needs to be ground away to renew the cutting edge.



We : Chisel edge wear width

Wf : Flank wear width (The middle of the cutting edge)

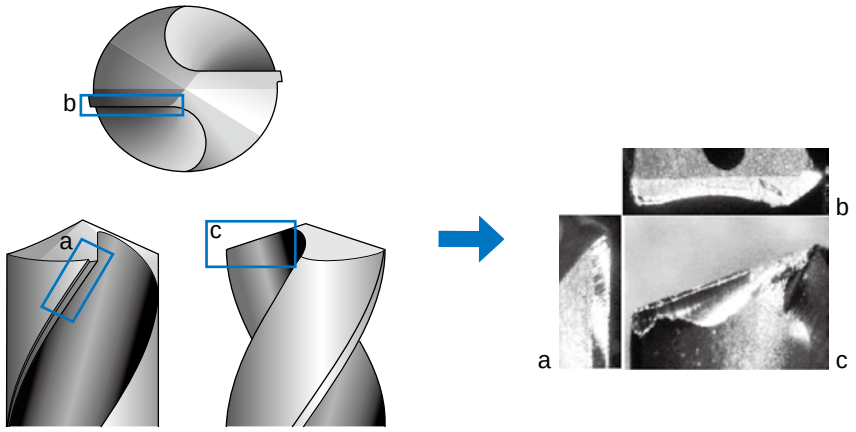
Wo : Outer corner wear width

Wm : Margin wear width

Wm' : Margin wear width (Leading edge)

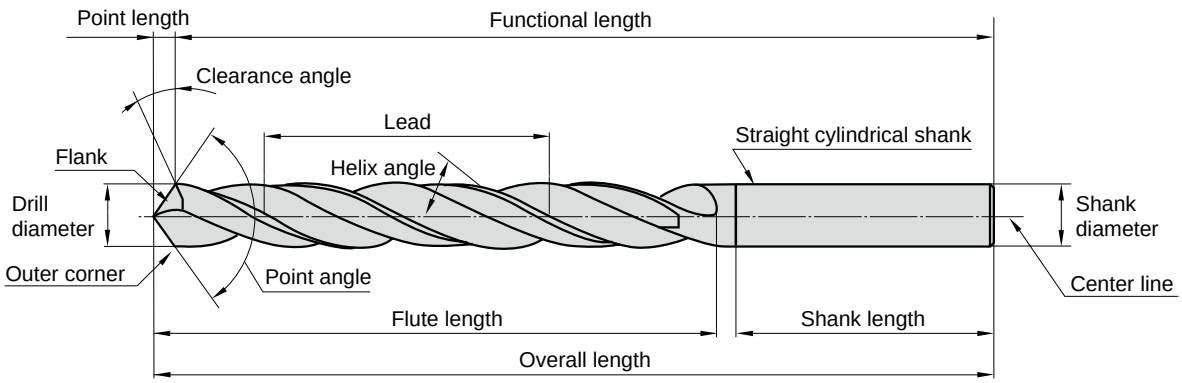
CUTTING EDGE DAMAGE

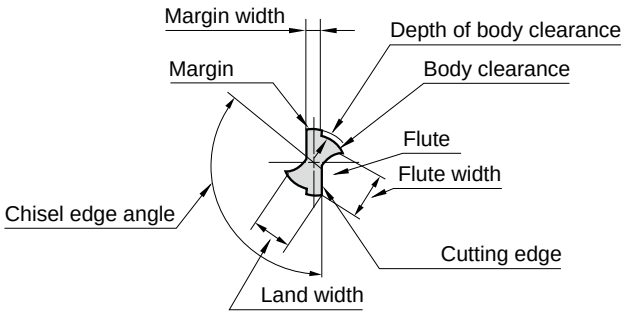
When drilling, the cutting edge of the drill can suffer from chipping, fracture and abnormal damage. In such cases it is important to take a closer look at the damage, investigate the cause and take countermeasures.



DRILL TERMINOLOGY AND CUTTING CHARACTERISTICS

NAMES OF EACH PART OF A DRILL





SHAPE SPECIFICATION AND CUTTING CHARACTERISTICS

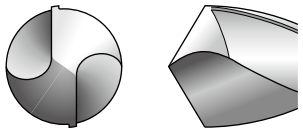
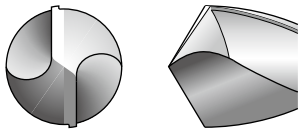
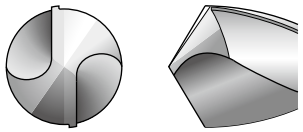
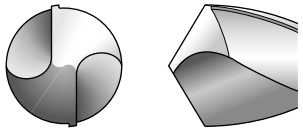
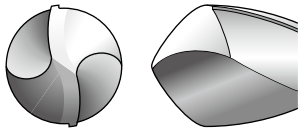
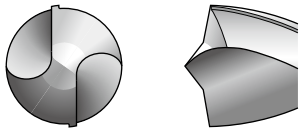
Helix Angle	Is the inclination of the flute with respect to the axial direction of a drill, which corresponds to the rake angle. The rake angle of a drill differs according to the position along the cutting edge. The rake angle is largest at the periphery and smallest towards the center of the cutting edge. The chisel edge has a negative rake angle, crushing the work. **High-hardness material** Small ◀•• Rake Angle ••▶ Large **Soft material** (Aluminum, etc.)
Flute Length	It is determined by depth of hole, guide bush length, and regrinding allowance. Since the influence on the tool life is great, it is necessary to minimize it as much as possible.
Point Angle	In general, the angle is 118° for high speed steel drills and 130—140° for carbide drills. **Soft material with good machinability** Small ◀•• Point angle ••▶ Large **For hard material and high-efficiency machining**
Web Thickness	It is an important element that determines the rigidity and chip disposal performance of a drill. The web thickness is set according to applications. Low cutting resistance Low rigidity Good chip disposal performance Machinable material Thin ◀•• Web thickness ••▶ Thick Large cutting resistance High rigidity Poor chip disposal High-hardness material, cross hole drilling, etc.
Margin	The margin determines the drill diameter and functions as a drill guide during drilling. The margin width is decided taking into consideration the friction within the hole to be drilled. **Poor guiding performance** Small ◀•• Margin width ••▶ Large **Good guiding performance**
Diameter Back Taper	To reduce friction with the inside of the drilled hole, the portion from the point to the shank is tapered slightly. The degree is usually represented by the quantity of reduction in the diameter with respect to the flute length, which is approx. .0016"—.016"/4".

DRILL TERMINOLOGY AND CUTTING CHARACTERISTICS

CUTTING EDGE GEOMETRY AND ITS INFLUENCE

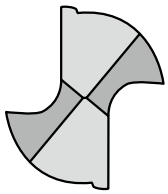
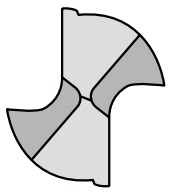
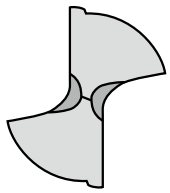
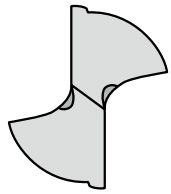
As shown in table below, it is possible to select the most suitable cutting edge geometry for different applications. If the most suitable cutting edge geometry is selected then higher machining efficiency and higher hole accuracy can be obtained.

Typical Cutting Edge Geometries

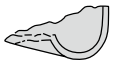
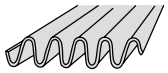
Grinding Name	Geometry	Features and Effect	Use
Conical		• The flank is conical and the clearance angle increases toward the center of the drill.	• For general use.
Flat		• The flank is flat and facilitates cutting.	• Mainly for small diameter drills.
Three Rake Angles		• As there is no chisel edge, the results are high centripetal force and small hole oversize. • Requires a special grinding machine. • Requires grinding of three sides.	• For drilling operations that require high hole accuracy and positioning accuracy.
Spiral Point		• To increase the clearance angle near the center of the drill, conical grinding combined with irregular helix. • S type chisel edge with high centripetal force and machining accuracy.	• For drilling that requires high accuracy.
Radial Lip		• The cutting edge is ground radial with the aim of dispersing load. • High machining accuracy and finished surface roughness. • For through holes, small burrs on the base. • Requires a special grinding machine.	• For cast iron and light alloy. • For cast iron plates. • Steel
Center Point Drill		• This geometry has two-stage point angle for better concentricity and a reduction in shock when exiting the workpiece.	• For thin sheet drilling.

WEB THINNING

The rake angle of the cutting edge of a drill reduces toward the center, and it changes into a negative angle at the chisel edge. During drilling, the center of a drill crushes the work, generating 50—70% of the cutting resistance. Web thinning is very effective for reduction in the cutting resistance of a drill, early removal of cut chips at the chisel edge, and better initial bite.

	X type	XR type	S type	N type
Geometry				
Features	The thrust load substantially reduces, and the bite performance improves. This is effective when the web is thick.	The initial performance is slightly inferior to that of the X type, but the cutting edge is tough and the applicable range of workpiece materials is wide.	Popular design, easy cutting type.	Effective when the web is comparatively thick.
Major Applications	General drilling and deep hole drilling.	General drilling and stainless steel drilling.	General drilling for steel, cast iron, and non-ferrous metal.	Deep hole drilling.

DRILLING CHIPS

Types of Chips	Geometry	Features and Ease of Raking
Conical Spiral		Fan-shaped chips cut by the cutting edge are curved by the flute. Chips of this type are produced when the feeding rate of ductile material is small. If the chip breaks after several turns, the chip raking performance is satisfactory.
Long Pitch		Long pitch chips exit without coiling and will coil around the drill.
Fan		This is a chip broken by the restraint caused by the drill flute and the wall of a drilled hole. It is generated when the feed rate is high.
Segment		A conical spiral chip that is broken before the chip grows into the long-pitch shape by the restraint caused by the wall of the drilled hole due to the insufficiency of ductility. Excellent chip disposal and chip discharge.
Zigzag		A chip that is buckled and folded because of the shape of flute and the characteristics of the material. It easily causes chip packing in the flute.
Needle		Chips broken by vibration or broken when brittle material is curled with a small radius. The raking performance is satisfactory, but these chips can become closely packed jams.

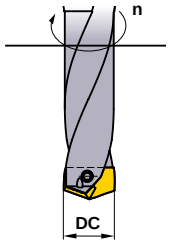
FORMULAS FOR DRILLING

CUTTING SPEED (vc)

$$vc = \frac{\pi \cdot DC \cdot n}{12} \text{ (SFM)}$$

vc (SFM) : Cutting Speed **DC(inch)** : Drill Diameter
π (3.14) : Circular Constant **n (min^{-1})** : Rotational Speed of the Main Spindle

*Unit transformation (from "mm" to "m")



(Problem) What is the cutting speed when main axis spindle speed is 1350min^{-1} and drill diameter is .500inch ?

(Answer) Substitute π=3.14, DC=.500inch, n=1350 into the formula

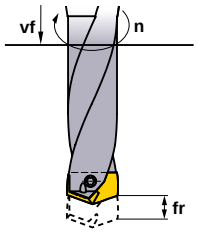
$$vc = \frac{\pi \cdot DC \cdot n}{12} = \frac{3.14 \times .500 \times 1350}{12} = 176.6\text{SFM}$$

The answer is 176.6SFM

FEED OF THE MAIN SPINDLE (vf)

$$vf = fr \cdot n \text{ (inch/min)}$$

vf (inch/min) : Feed Speed of the Main Spindle (Z axis)
fr (IPR) : Feed per Revolution
n (min^{-1}) : Rotational Speed of the Main Spindle



(Problem) What is the spindle feed (vf) when feed per revolution is .008IPR and main axis spindle speed is 1350min^{-1}?

(Answer) Substitute fr=.008, n=1350 into the formula

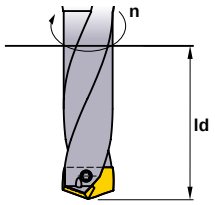
vf = fr×n = .008×1350 = 10.8inch/min

The answer is 10.8inch/min.

DRILLING TIME (Tc)

$$Tc = \frac{ld \cdot i}{n \cdot fr}$$

Tc (min) : Drilling Time
n (min^{-1}) : Spindle Speed
ld (inch) : Hole Depth
fr (IPR) : Feed per Revolution
i : Number of Holes



(Problem) What is the drilling time required for drilling a 1.2inch length hole in alloy steel at a cutting speed of 165SFM and feed .006IPR ?

(Answer) Spindle Speed $n = \frac{165 \times 12}{.59 \times 3.14} = 1068.8\text{min}^{-1}$

$$Tc = \frac{1.2 \times 1}{1068.8 \times .006} = .187$$

$$= .187 \times 60 \fallingdotseq 11.2 \text{ sec}$$

The answer is 11.2 sec.

TOOL WEAR AND DAMAGE

CAUSES AND COUNTERMEASURES

Tool Damage Form		Cause	Countermeasure
Flank Wear		· Tool grade is too soft. · Cutting speed is too high. · Flank angle is too small. · Feed rate is extremely low.	· Tool grade with high wear resistance. · Lower cutting speed. · Increase flank angle. · Increase feed rate.
Crater Wear		· Tool grade is too soft. · Cutting speed is too high. · Feed rate is too high.	· Tool grade with high wear resistance. · Lower cutting speed. · Lower feed rate.
Chipping		· Tool grade is too hard. · Feed rate is too high. · Lack of cutting edge strength. · Lack of shank or holder rigidity.	· Tool grade with high toughness. · Lower feed rate. · Increase honing. (Round honing is to be changed to chamfer honing.) · Use large shank size.
Fracture		· Tool grade is too hard. · Feed rate is too high. · Lack of cutting edge strength. · Lack of shank or holder rigidity.	· Tool grade with high toughness. · Lower feed rate. · Increase honing. (Round honing is to be changed to chamfer honing.) · Use large shank size.
Plastic Deformation		· Tool grade is too soft. · Cutting speed is too high. · Depth of cut and feed rate are too large. · Cutting temperature is high.	· Tool grade with high wear resistance. · Lower cutting speed. · Decrease depth of cut and feed rate. · Tool grade with high thermal conductivity.
Welding		· Cutting speed is low. · Poor sharpness. · Unsuitable grade.	· Increase cutting speed. (For ANSI 1045, cutting speed 260 SFM.) · Increase rake angle. · Tool grade with low affinity. (Coated grade, cermet grade)
Thermal Cracks		· Expansion or shrinkage due to cutting heat. · Tool grade is too hard. *Especially in milling.	· Dry cutting. (For wet cutting, flood workpiece with cutting fluid) · Tool grade with high toughness.
Notching		· Hard surfaces such as uncut surface, chilled parts and machining hardened layer. · Friction caused by jagged shaped chips. (Caused by small vibration)	· Tool grade with high wear resistance. · Increase rake angle to improve sharpness.
Flaking		· Cutting edge welding and adhesion. · Poor chip disposal.	· Increase rake angle to improve sharpness. · Enlarge chip pocket.

MATERIAL CROSS REFERENCE LIST

CARBON STEEL

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
A570.36	STKM 12A STKM 12C	1.0038	RSt.37-2	4360 40 C	–	E 24-2 Ne	–	–	1311	15
1015	–	1.0401	C15	080M15	–	CC12	C15, C16	F.111	1350	15
1020	–	1.0402	C22	050A20	2C	CC20	C20, C21	F.112	1450	20
1213	SUM22	1.0715	9SMn28	230M07	1A	S250	CF9SMn28	F.2111 11SMn28	1912	Y15
12L13	SUM22L	1.0718	9SMnPb28	–	–	S250Pb	CF9SMnPb28	11SMnPb28	1914	–
–	–	1.0722	10SPb20	–	–	10PbF2	CF10Pb20	10SPb20	–	–
1215	–	1.0736	9SMn36	240M07	1B	S300	CF9SMn36	12SMn35	–	Y13
12L14	–	1.0737	9SMnPb36	–	–	S300Pb	CF9SMnPb36	12SMnP35	1926	–
1015	S15C	1.1141	Ck15	080M15	32C	XC12	C16	C15K	1370	15
1025	S25C	1.1158	Ck25	–	–	–	–	–	–	25
A572-60	–	1.8900	StE380	4360 55 E	–	–	FeE390KG	–	2145	–
1035	–	1.0501	C35	060A35	–	CC35	C35	F.113	1550	35
1045	–	1.0503	C45	080M46	–	CC45	C45	F.114	1650	45
1140	–	1.0726	35S20	212M36	8M	35MF4	–	F210G	1957	–
1039	–	1.1157	40Mn4	150M36	15	35M5	–	–	–	40Mn
1335	SMn438(H)	1.1167	36Mn5	–	–	40M5	–	36Mn5	2120	35Mn2
1330	SCMn1	1.1170	28Mn6	150M28	14A	20M5	C28Mn	–	–	30Mn
1035	S35C	1.1183	Cf35	060A35	–	XC38TS	C36	–	1572	35Mn
1045	S45C	1.1191	Ck45	080M46	–	XC42	C45	C45K	1672	Ck45
1050	S50C	1.1213	Cf53	060A52	–	XC48TS	C53	–	1674	50
1055	–	1.0535	C55	070M55	9	–	C55	–	1655	55
1060	–	1.0601	C60	080A62	43D	CC55	C60	–	–	60
1055	S55C	1.1203	Ck55	070M55	–	XC55	C50	C55K	–	55
1060	S58C	1.1221	Ck60	080A62	43D	XC60	C60	–	1678	60Mn
1095	–	1.1274	Ck101	060A96	–	XC100	–	F.5117	1870	–
W1	SK3	1.1545	C105W1	BW1A	–	Y105	C36KU	F.5118	1880	–
W210	SUP4	1.1545	C105W1	BW2	–	Y120	C120KU	F.515	2900	–

ALLOY STEEL

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
A573-81	SM400A, SM400B SM400C	1.0144	St.44.2	4360 43 C	–	E28-3	–	–	1412	–
–	SM490A, SM490B SM490C	1.0570	St52-3	4360 50 B	–	E36-3	Fe52BFN Fe52CFN	–	2132	–
5120	–	1.0841	St52-3	150M19	–	20MC5	Fe52	F.431	2172	–
9255	–	1.0904	55Si7	250A53	45	55S7	55Si8	56Si7	2085	55Si2Mn
9262	–	1.0961	60SiCr7	–	–	60SC7	60SiCr8	60SiCr8	–	–
ASTM 52100	SUJ2	1.3505	100Cr6	534A99	31	100C6	100Cr6	F.131	2258	Gr15, 45G
ASTM A204Gr.A	–	1.5415	15Mo3	1501-240	–	15D3	16Mo3KW	16Mo3	2912	–
4520	–	1.5423	16Mo5	1503-245-420	–	–	16Mo5	16Mo5	–	–
ASTM A350LF5	–	1.5622	14Ni6	–	–	16N6	14Ni6	15Ni6	–	–
ASTM A353	–	1.5662	X8Ni9	1501-509-510	–	–	X10Ni9	XBNi09	–	–
3135	SNC236	1.5710	36NiCr6	640A35	111A	35NC6	–	–	–	–
3415	SNC415(H)	1.5732	14NiCr10	–	–	14NC11	16NiCr11	15NiCr11	–	–
3415, 3310	SNC815(H)	1.5752	14NiCr14	655M13	36A	12NC15	–	–	–	–
8620	SNCM220(H)	1.6523	21NiCrMo2	805M20	362	20NCD2	20NiCrMo2	20NiCrMo2	2506	–
8740	SNCM240	1.6546	40NiCrMo22	311-Type 7	–	–	40NiCrMo2(KB)	40NiCrMo2	–	–
–	–	1.6587	17CrNiMo6	820A16	–	18NCD6	–	14NiCrMo13	–	–
5015	SCr415(H)	1.7015	15Cr3	523M15	–	12C3	–	–	–	15Cr

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
5140	SCr440	1.7045	42Cr4	–	–	–	–	42Cr4	2245	40Cr
5155	SUP9(A)	1.7176	55Cr3	527A60	48	55C3	–	–	–	20CrMn
–	SCM415(H)	1.7262	15CrMo5	–	–	12CD4	–	12CrMo4	2216	–
ASTM A182 F11, F12	–	1.7335	13CrMo4 4	1501-620Gr27	–	15CD3.5 15CD4.5	14CrMo45	14CrMo45	–	–
ASTM A182 F.22	–	1.7380	10CrMo910	1501-622 Gr31, 45	–	12CD9 12CD10	12CrMo9 12CrMo10	TU.H	2218	–
–	–	1.7715	14MoV63	1503-660-440	–	–	–	13MoCrV6	–	–
–	–	1.8523	39CrMoV13 9	897M39	40C	–	36CrMoV12	–	–	–
9840	–	1.6511	36CrNiMo4	816M40	110	40NCD3	38NiCrMo4(KB)	35NiCrMo4	–	–
4340	–	1.6582	34CrNiMo6	817M40	24	35NCD6	35NiCrMo6(KB)	–	2541	40CrNiMoA
5132	SCr430(H)	1.7033	34Cr4	530A32	18B	32C4	34Cr4(KB)	35Cr4	–	35Cr
5140	SCr440(H)	1.7035	41Cr4	530M40	18	42C4	41Cr4	42Cr4	–	40Cr
5115	–	1.7131	16MnCr5	(527M20)	–	16MC5	16MnCr5	16MnCr5	2511	18CrMn
4130	SCM420 SCM430	1.7218	25CrMo4	1717CDS110 708M20	–	25CD4	25CrMo4(KB)	55Cr3	2225	30CrMn
4137 4135	SCM432 SCCRM3	1.7220	34CrMo4	708A37	19B	35CD4	35CrMo4	34CrMo4	2234	35CrMo
4140 4142	SCM 440	1.7223	41CrMo4	708M40	19A	42CD4TS	41CrMo4	42CrMo4	2244	40CrMoA
4140	SCM440(H)	1.7225	42CrMo4	708M40	19A	42CD4	42CrMo4	42CrMo4	2244	42CrMo 42CrMnMo
–	–	1.7361	32CrMo12	722M24	40B	30CD12	32CrMo12	F.124.A	2240	–
6150	SUP10	1.8159	50CrV4	735A50	47	50CV4	50CrV4	51CrV4	2230	50CrVA
–	–	1.8509	41CrAlMo7	905M39	41B	40CAD6 40CAD2	41CrAlMo7	41CrAlMo7	2940	–
L3	–	1.2067	100Cr6	BL3	–	Y100C6	–	100Cr6	–	CrV, 9SiCr
–	SKS31 SKS2, SKS3	1.2419	105WCr6	–	–	105WC13	100WCr6 107WCr5KU	105WCr5	2140	CrWMo
L6	SKT4	1.2713	55NiCrMoV6	BH224/5	–	55NCDV7	–	F.520.S	–	5CrNiMo
ASTM A353	–	1.5662	X8Ni9	1501-509	–	–	X10Ni9	XBNi09	–	–
2515	–	1.5680	12Ni19	–	–	Z18N5	–	–	–	–
–	–	1.6657	14NiCrMo134	832M13	36C	–	15NiCrMo13	14NiCrMo131	–	–
D3 ASTM D3	SKD1	1.2080	X210Cr12	BD3	–	Z200C12	X210Cr13KU X250Cr12KU	X210Cr12	–	Cr12
D2	SKD11	1.2601	X153CrMoV12	BD2	–	–	X160CrMoV12	–	–	Cr12MoV
A2	SKD12	1.2363	X100CrMoV5	BA2	–	Z100CDV5	X100CrMoV5	F.5227	2260	Cr5Mo1V
H13 ASTM H13	SKD61	1.2344	X40CrMoV51 X40CrMoV51	BH13	–	Z40CDV5	X35CrMoV05KU X40CrMoV51KU	X40CrMoV5	2242	40CrMoV5
–	SKD2	1.2436	X210CrW12	–	–	–	X215CrW121KU	X210CrW12	2312	–
S1	–	1.2542	45WCrV7	BS1	–	–	45WCrV8KU	45WCrSi8	2710	–
H21	SKD5	1.2581	X30WCrV93	BH21	–	Z30WCV9	X28W09KU	X30WCrV9	–	30WCrV9
–	–	1.2601	X165CrMoV12	–	–	–	X165CrMoW12KU	X160CrMoV12	2310	–
W210	SKS43	1.2833	100V1	BW2	–	Y1105V	–	–	–	V
T4	SKH3	1.3255	S 18-1-2-5	BT4	–	Z80WKCV	X78WCo1805KU	HS18-1-1-5	–	W18Cr4VCo5
T1	SKH2	1.3355	S 18-0-1	BT1	–	Z80WCV	X75W18KU	HS18-0-1	–	–
–	SCMnH/1	1.3401	G-X120Mn12	Z120M12	–	Z120M12	XG120Mn12	X120MN12	–	–
HW3	SUH1	1.4718	X45CrSi93	401S45	52	Z45CS9	X45CrSi8	F.322	–	X45CrSi93
D3	SUH3	1.3343	S6-5-2	4959BA2	–	Z40CSD10	15NiCrMo13	–	2715	–
M2	SKH9, SKH51	1.3343	S6/5/2	BM2	–	Z85WDCV	HS6-5-2-2	F.5603	2722	–
M7	–	1.3348	S 2-9-2	–	–	–	HS2-9-2	HS2-9-2	2782	–
M35	SKH55	1.3243	S6/5/2/5	BM35	–	6-5-2-5	HS6-5-2-5	F.5613	2723	–

MATERIAL CROSS REFERENCE LIST

STAINLESS STEEL (FERRITIC, MARTENSITIC)

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
403	SUS403	1.4000	X7Cr13	403S17	–	Z6C13	X6Cr13	F.3110	2301	OCr13 1Cr12
–	–	1.4001	X7Cr14	–	–	–	–	F.8401	–	–
416	SUS416	1.4005	X12CrS13	416S21	–	Z11CF13	X12CrS13	F.3411	2380	–
410	SUS410	1.4006	X10Cr13	410S21	56A	Z10C14	X12Cr13	F.3401	2302	1Cr13
430	SUS430	1.4016	X8Cr17	430S15	60	Z8C17	X8Cr17	F.3113	2320	1Cr17
–	SCS2	1.4027	G-X20Cr14	420C29	56B	Z20C13M	–	–	–	–
–	SUS420J2	1.4034	X46Cr13	420S45	56D	Z40CM Z38C13M	X40Cr14	F.3405	2304	4Cr13
405	–	1.4003	–	405S17	–	Z8CA12	X6CrAl13	–	–	–
420	–	1.4021	–	420S37	–	Z8CA12	X20Cr13	–	2303	–
431	SUS431	1.4057	X22CrNi17	431S29	57	Z15CNi6.02	X16CrNi16	F.3427	2321	1Cr17Ni2
430F	SUS430F	1.4104	X12CrMoS17	–	–	Z10CF17	X10CrS17	F.3117	2383	Y1Cr17
434	SUS434	1.4113	X6CrMo17	434S17	–	Z8CD17.01	X8CrMo17	–	2325	1Cr17Mo
CA6-NM	SCS5	1.4313	X5CrNi134	425C11	–	Z4CND13.4M	(G)X6CrNi304	–	2385	–
405	SUS405	1.4724	X10CrA113	403S17	–	Z10C13	X10CrA112	F.311	–	OCr13Al
430	SUS430	1.4742	X10CrA118	430S15	60	Z10CAS18	X8Cr17	F.3113	–	Cr17
HNV6	SUH4	1.4747	X80CrNiSi20	443S65	59	Z80CSN20.02	X80CrSiNi20	F.320B	–	–
446	SUH446	1.4762	X10CrA124	–	–	Z10CAS24	X16Cr26	–	2322	2Cr25N
EV8	SUH35	1.4871	X53CrMnNiN219	349S54	–	Z52CMN21.09	X53CrMnNiN219	–	–	5Cr2Mn9Ni4N
S44400	–	1.4521	X1CrMoTi182	–	–	–	–	–	2326	–
–	–	1.4922	X20CrMoV12-1	–	–	–	X20CrMoNi1201	–	2317	–
630	–	1.4542	–	–	–	Z7CNU17-04	–	–	–	–

STAINLESS STEEL (AUSTENITIC)

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
304L	SUS304L	1.4306	X2CrNi1911	304S11	–	Z2CN18.10	X2CrNi18.11	–	2352	OCr19Ni10
304	SUS304	1.4350	X5CrNi189	304S11	58E	Z6CN18.09	X5CrNi1810	F.3551 F.3541 F.3504	2332	OCr18Ni9
303	SUS303	1.4305	X12CrNiS188	303S21	58M	Z10CNF18.09	X10CrNiS18.09	F.3508	2346	1Cr18Ni9MoZr
–	SUS304L	–	–	304C12	–	Z3CN19.10	–	–	2333	–
304L	SCS19	1.4306	X2CrNi189	304S12	–	Z2CrNi1810	X2CrNi18.11	F.3503	2352	–
301	SUS301	1.4310	X12CrNi177	–	–	Z12CN17.07	X12CrNi1707	F.3517	2331	Cr17Ni7
304LN	SUS304LN	1.4311	X2CrNiN1810	304S62	–	Z2CN18.10	–	–	2371	–
316	SUS316	1.4401	X5CrNiMo1810	316S16	58J	Z6CND17.11	X5CrNiMo1712	F.3543	2347	0Cr17Ni11Mo2
–	SCS13	1.4308	G-X6CrNi189	304C15	–	Z6CN18.10M	–	–	–	–
–	SCS14	1.4408	G-X6CrNiMo1810	316C16	–	–	–	F.8414	–	–
–	SCS22	1.4581	G-X5CrNiMoNb1810	318C17	–	Z4CNDNb1812M	XG8CrNiMo1811	–	–	–
316LN	SUS316LN	1.4429	X2CrNiMoN1813	–	–	Z2CND17.13	–	–	2375	OCr17Ni13Mo
316L	–	1.4404	–	316S13	–	Z2CND17.12	X2CrNiMo1712	–	2348	–
316L	SCS16 SUS316L	1.4435	X2CrNiMo1812	316S13	–	Z2CND17.12	X2CrNiMo1712	–	2353	OCr27Ni12Mo3
316	–	1.4436	–	316S13	–	Z6CND18-12-03	X8CrNiMo1713	–	2343, 2347	–
317L	SUS317L	1.4438	X2CrNiMo1816	317S12	–	Z2CND19.15	X2CrNiMo1816	–	2367	OOCr19Ni13Mo
UNS V 0890A	–	1.4539	X1NiCrMo	–	–	Z6CNT18.10	–	–	2562	–
321	SUS321	1.4541	X10CrNiTi189	321S12	58B	Z6CNT18.10	X6CrNiTi1811	F.3553 F.3523	2337	1Cr18NI9Ti
347	SUS347	1.4550	X10CrNiNb189	347S17	58F	Z6CNNb18.10	X6CrNiNb1811	F.3552 F.3524	2338	1Cr18Ni11Nb
316Ti	–	1.4571	X10CrNiMoTi1810	320S17	58J	Z6CNDT17.12	X6CrNiMoTi1712	F.3535	2350	Cr18Ni12Mo2T
318	–	1.4583	X10CrNiMoNb1812	–	–	Z6CNDNb1713B	X6CrNiMoNb1713	–	–	Cr17Ni12Mo3Mb

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
309	SUH309	1.4828	X15CrNiSi2012	309S24	–	Z15CNS20.12	X6CrNi2520	–	–	1Cr23Ni13
310S	SUH310	1.4845	X12CrNi2521	310S24	–	Z12CN2520	X6CrNi2520	F.331	2361	OCr25Ni20
308	SCS17	1.4406	X10CrNi18.08	–	58C	Z1NCDU25.20	–	F.8414	2370	–
–	–	1.4418	X4CrNiMo165	–	–	Z6CND16-04-01	–	–	–	–
17-7PH	–	1.4568 1.4504	–	316S111	–	Z8CNA17-07	X2CrNiMo1712	–	–	–
NO8028 S31254	–	1.4563	–	–	–	Z1NCDU31-27-03 Z1CNDU20-18-06AZ	–	–	2584 2378	–
321	SUS321	1.4878	X12CrNiTi189	321S32	58B, 58C	Z6CNT18.12B	X6CrNiTi18 11	F.3523	–	1Cr18Ni9Ti

HEAT RESISTANT STEELS

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
330	SUH330	1.4864	X12NiCrSi3616	–	–	Z12NCS35.16	–	–	–	–
HT, HT 50	SCH15	1.4865	G-X40NiCrSi3818	330C11	–	–	XG50NiCr3919	–	–	–

GRAY CAST IRON

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
–	–	–	–	–	–	–	–	–	0100	–
No 20 B	FC100	–	GG 10	–	–	Ft 10 D	–	–	0110	–
No 25 B	FC150	0.6015	GG 15	Grade 150	–	Ft 15 D	G15	FG15	0115	HT150
No 30 B	FC200	0.6020	GG 20	Grade 220	–	Ft 20 D	G20	–	0120	HT200
No 35 B	FC250	0.6025	GG 25	Grade 260	–	Ft 25 D	G25	FG25	0125	HT250
No 40 B	–	–	–	–	–	–	–	–	–	–
No 45 B	FC300	0.6030	GG 30	Grade 300	–	Ft 30 D	G30	FG30	0130	HT300
No 50 B	FC350	0.6035	GG 35	Grade 350	–	Ft 35 D	G35	FG35	0135	HT350
No 55 B	–	0.6040	GG 40	Grade 400	–	Ft 40 D	–	–	0140	HT400
A436 Type 2	–	0.6660	GGL NiCr202	L-NiCuCr202	–	L-NC 202	–	–	0523	–

DUCTILE CAST IRON

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
60-40-18	FCD400	0.7040	GGG 40	SNG 420/12	–	FCS 400-12	GS 370-17	FGE 38-17	07 17-02	QT400-18
–	–	–	GGG 40.3	SNG 370/17	–	FGS 370-17	–	–	07 17-12	–
–	–	0.7033	GGG 35.3	–	–	–	–	–	07 17-15	–
80-55-06	FCD500	0.7050	GGG 50	SNG 500/7	–	FGS 500-7	GS 500	FGE 50-7	07 27-02	QT500-7
A43D2	–	0.7660	GGG NiCr202	Grade S6	–	S-NC202	–	–	07 76	–
–	–	–	GGG NiMn137	L-NiMn 137	–	L-MN 137	–	–	07 72	–
–	FCD600	–	GGG 60	SNG 600/3	–	FGS 600-3	–	–	07 32-03	QT600-3
100-70-03	FCD700	0.7070	GGG 70	SNG 700/2	–	FGS 700-2	GS 700-2	FGS 70-2	07 37-01	QT700-18

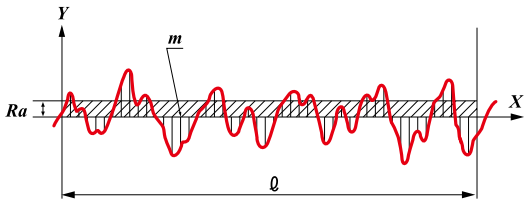
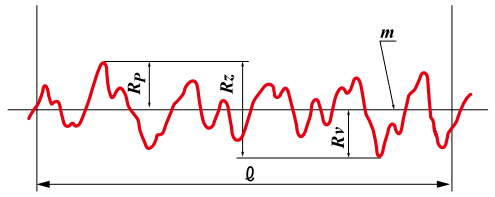
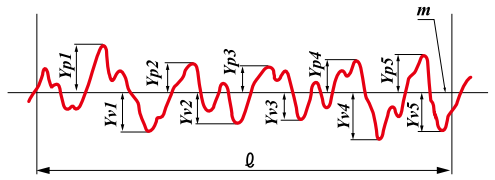
MALLEABLE CAST IRON

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
–	FCMB310	–	–	8 290/6	–	MN 32-8	–	–	08 14	–
32510	FCMW330	–	GTS-35	B 340/12	–	MN 35-10	–	–	08 15	–
40010	FCMW370	0.8145	GTS-45	P 440/7	–	Mn 450	GMN45	–	08 52	–
50005	FCMP490	0.8155	GTS-55	P 510/4	–	MP 50-5	GMN55	–	08 54	–
70003	FCMP540	–	GTS-65	P 570/3	–	MP 60-3	–	–	08 58	–
A220-70003	FCMP590	0.8165	GTS-65-02	P 570/3	–	Mn 650-3	GMN 65	–	08 56	–
A 220-80002	FCMP690	–	GTS-70-02	P 690/2	–	Mn 700-2	GMN 70	–	08 62	–

SURFACE ROUGHNESS

SURFACE ROUGHNESS

(From JIS B 0601-1994)

Type	Code	Determination	Determination Example (Figure)
Arithmetical Mean Roughness	Ra	Ra means the value obtained by the following formula and expressed in micrometer (μm) when sampling only the reference length from the roughness curve in the direction of the mean line, taking X-axis in the direction of mean line and Y-axis in the direction of longitudinal magnification of this sampled part and the roughness curve is expressed by y=f(x): $Ra=\frac{1}{\ell}\int_0^{\ell}\{f(x)\}dx$ (μm)	
Maximum Height	Rz	Rz shall be that only when the reference length is sampled from the roughness curve in the direction of the mean line, the distance between the top profile peak line and the bottom profile valley line on this sampled portion is measured in the longitudinal magnification direction of roughness curve and the obtained value is expressed in micrometer (μm). (Note) When finding Rz, a portion without an exceptionally high peak or low valley, which may be regarded as a flaw, is selected as the sampling length. $Rz=R_P+Rv$ (μm)	
Ten-Point Mean Roughness	RzJIS	RzJIS shall be that only when the reference length is sampled from the roughness curve in the direction of its mean line, the sum of the average value of absolute values of the heights of five highest profile peaks (Yp) and the depths of five deepest profile valleys (Yv) measured in the vertical magnification direction from the mean line of this sampled portion and this sum is expressed in micrometer (μm). $Rz_{JIS}=\frac{(Yp1+Yp2+Yp3+Yp4+Yp5)+(Yv1+Yv2+Yv3+Yv4+Yv5)}{5}$ (μm)	 $Yp1, Yp2, Yp3, Yp4, Yp5$:altitudes of the five highest profile peaks of the sampled portion corresponding to the reference length l. $Yv1, Yv2, Yv3, Yv4, Yv5$:altitudes of the five deepest profile valleys of the sampled portion corresponding to the reference length l.

RELATIONSHIP BETWEEN ARITHMETICAL MEAN (Ra) AND CONVENTIONAL DESIGNATION (REFERENCE DATA)

Arithmetical Mean Roughness Ra		Max. Height Rz	Ten-Point Mean Roughness RzJIS	Sampling Length for Rz • RzJIS l (mm)	Conventional Finish Mark
Standard Series	Cutoff Value λc (mm)	Standard Series			
0.012 a	0.08	0.05s	0.05z	0.08	▽▽▽▽
0.025 a	0.25	0.1 s	0.1 z		
0.05 a		0.2 s	0.2 z	0.25	
0.1 a	0.8	0.4 s	0.4 z		
0.2 a		0.8 s	0.8 z	0.8	
0.4 a		1.6 s	1.6 z		▽▽▽
0.8 a		3.2 s	3.2 z		
1.6 a		6.3 s	6.3 z		
3.2 a	2.5	12.5 s	12.5 z	2.5	▽▽
6.3 a		25 s	25 z		
12.5 a	8	50 s	50 z		▽
25 a		100 s	100 z	8	
50 a		200 s	200 z		—
100 a	—	400 s	400 z	—	

∗The correlation among the three is shown for convenience and is not exact.
∗Ra : The evaluation length of Rz and RzJIS is the cutoff value and sampling length multiplied by 5, respectively.

HARDNESS COMPARISON TABLE

HARDNESS CONVERSION NUMBERS OF STEEL

Brinell Hardness (HB), 10mm Ball, Load: 3,000kgf		Vickers Hardness (HV)	Rockwell Hardness (3)				Shore Hardness (HS)	Tensile Strength (Approx.) MPa (2)
Standard Ball	Tungsten Carbide Ball		A Scale, Load: 60kgf, Diamond Point (HRA)	B Scale, Load: 100kgf, 1/16" Ball (HRB)	C Scale, Load: 150kgf, Diamond Point (HRC)	D Scale, Load: 100kgf, Diamond Point (HRD)		
—	—	940	85.6	—	68.0	76.9	97	—
—	—	920	85.3	—	67.5	76.5	96	—
—	—	900	85.0	—	67.0	76.1	95	—
—	(767)	880	84.7	—	66.4	75.7	93	—
—	(757)	860	84.4	—	65.9	75.3	92	—
—	(745)	840	84.1	—	65.3	74.8	91	—
—	(733)	820	83.8	—	64.7	74.3	90	—
—	(722)	800	83.4	—	64.0	73.8	88	—
—	(712)	—	—	—	—	—	—	—
—	(710)	780	83.0	—	63.3	73.3	87	—
—	(698)	760	82.6	—	62.5	72.6	86	—
—	(684)	740	82.2	—	61.8	72.1	—	—
—	(682)	737	82.2	—	61.7	72.0	84	—
—	(670)	720	81.8	—	61.0	71.5	83	—
—	(656)	700	81.3	—	60.1	70.8	—	—
—	(653)	697	81.2	—	60.0	70.7	81	—
—	(647)	690	81.1	—	59.7	70.5	—	—
—	(638)	680	80.8	—	59.2	70.1	80	—
—	630	670	80.6	—	58.8	69.8	—	—
—	627	667	80.5	—	58.7	69.7	79	—
—	—	677	80.7	—	59.1	70.0	—	—
—	601	640	79.8	—	57.3	68.7	77	—
—	—	640	79.8	—	57.3	68.7	—	—
—	578	615	79.1	—	56.0	67.7	75	—
—	—	607	78.8	—	55.6	67.4	—	—
—	555	591	78.4	—	54.7	66.7	73	2055
—	—	579	78.0	—	54.0	66.1	—	2015
—	534	569	77.8	—	53.5	65.8	71	1985
—	—	533	77.1	—	52.5	65.0	—	1915
—	514	547	76.9	—	52.1	64.7	70	1890
(495)	—	539	76.7	—	51.6	64.3	—	1855
—	—	530	76.4	—	51.1	63.9	—	1825
	495	528	76.3	—	51.0	63.8	68	1820
(477)	—	516	75.9	—	50.3	63.2	—	1780
—	—	508	75.6	—	49.6	62.7	—	1740
	477	508	75.6	—	49.6	62.7	66	1740
(461)	—	495	75.1	—	48.8	61.9	—	1680
—	—	491	74.9	—	48.5	61.7	—	1670
	461	491	74.9	—	48.5	61.7	65	1670
444	—	474	74.3	—	47.2	61.0	—	1595
—	—	472	74.2	—	47.1	60.8	—	1585
—	444	472	74.2	—	47.1	60.8	63	1585

Brinell Hardness (HB), 10mm Ball, Load: 3,000kgf		Vickers Hardness (HV)	Rockwell Hardness (3)				Shore Hardness (HS)	Tensile Strength (Approx.) MPa (2)
Standard Ball	Tungsten Carbide Ball		A Scale, Load: 60kgf, Diamond Point (HRA)	B Scale, Load: 100kgf, 1/16" Ball (HRB)	C Scale, Load: 150kgf, Diamond Point (HRC)	D Scale, Load: 100kgf, Diamond Point (HRD)		
429	429	455	73.4	—	45.7	59.7	61	1510
415	415	440	72.8	—	44.5	58.8	59	1460
401	401	425	72.0	—	43.1	57.8	58	1390
388	388	410	71.4	—	41.8	56.8	56	1330
375	375	396	70.6	—	40.4	55.7	54	1270
363	363	383	70.0	—	39.1	54.6	52	1220
352	352	372	69.3	(110.0)	37.9	53.8	51	1180
341	341	360	68.7	(109.0)	36.6	52.8	50	1130
331	331	350	68.1	(108.5)	35.5	51.9	48	1095
321	321	339	67.5	(108.0)	34.3	51.0	47	1060
311	311	328	66.9	(107.5)	33.1	50.0	46	1025
302	302	319	66.3	(107.0)	32.1	49.3	45	1005
293	293	309	65.7	(106.0)	30.9	48.3	43	970
285	285	301	65.3	(105.5)	29.9	47.6	—	950
277	277	292	64.6	(104.5)	28.8	46.7	41	925
269	269	284	64.1	(104.0)	27.6	45.9	40	895
262	262	276	63.6	(103.0)	26.6	45.0	39	875
255	255	269	63.0	(102.0)	25.4	44.2	38	850
248	248	261	62.5	(101.0)	24.2	43.2	37	825
241	241	253	61.8	100	22.8	42.0	36	800
235	235	247	61.4	99.0	21.7	41.4	35	785
229	229	241	60.8	98.2	20.5	40.5	34	765
223	223	234	—	97.3	(18.8)	—	—	—
217	217	228	—	96.4	(17.5)	—	33	725
212	212	222	—	95.5	(16.0)	—	—	705
207	207	218	—	94.6	(15.2)	—	32	690
201	201	212	—	93.8	(13.8)	—	31	675
197	197	207	—	92.8	(12.7)	—	30	655
192	192	202	—	91.9	(11.5)	—	29	640
187	187	196	—	90.7	(10.0)	—	—	620
183	183	192	—	90.0	(9.0)	—	28	615
179	179	188	—	89.0	(8.0)	—	27	600
174	174	182	—	87.8	(6.4)	—	—	585
170	170	178	—	86.8	(5.4)	—	26	570
167	167	175	—	86.0	(4.4)	—	—	560
163	163	171	—	85.0	(3.3)	—	25	545
156	156	163	—	82.9	(0.9)	—	—	525
149	149	156	—	80.8	—	—	23	505
143	143	150	—	78.7	—	—	22	490
137	137	143	—	76.4	—	—	21	460
131	131	137	—	74.0	—	—	—	450
126	126	132	—	72.0	—	—	20	435
121	121	127	—	69.8	—	—	19	415
116	116	122	—	67.6	—	—	18	400
111	111	117	—	65.7	—	—	15	385

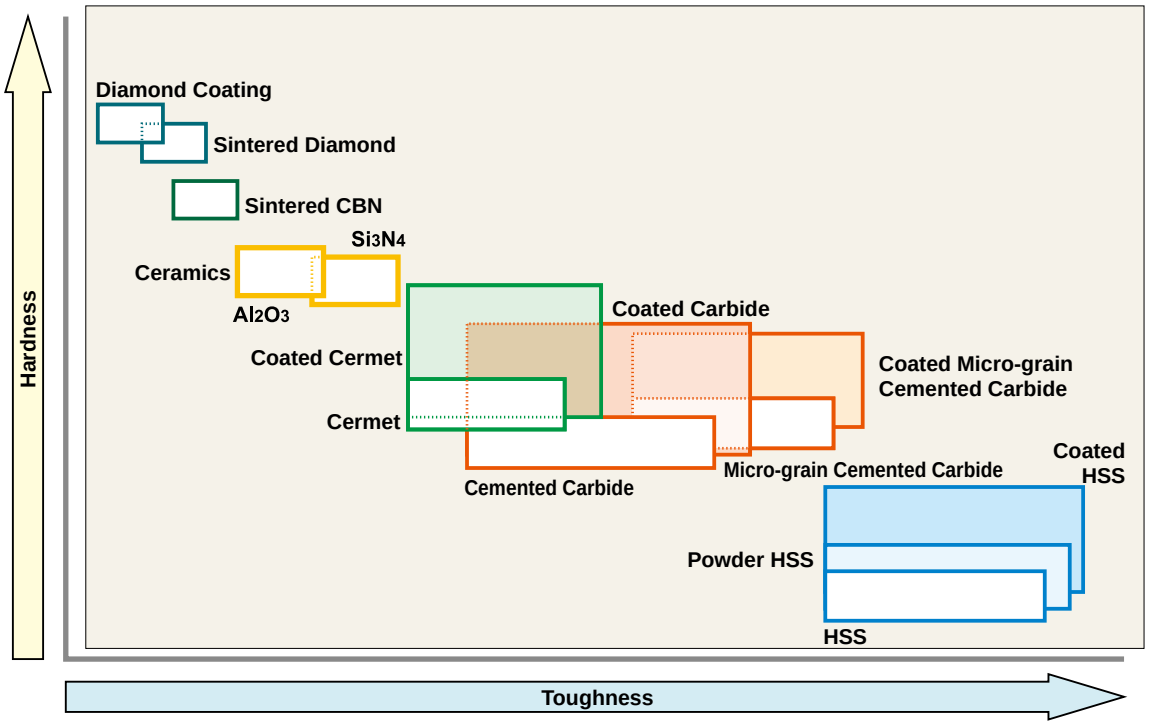
(Note 1) The above list is the same as that of AMS Metals Hand book with tensile strength in approximate metric value and Brinell hardness over a recommended range.

(Note 2) 1MPa=1N/mm^2

(Note 3) Figures in ( ) are rarely used and are included for reference. This list has been taken from JIS Handbook Steel I.

CUTTING TOOL MATERIALS

The chart below shows the relationship between various tool materials, in relation with hardness on a vertical axis and toughness on a horizontal axis.
Today, cemented carbide, coated carbide and TiC-TiN-based cermet are key tool materials in the market, as they offer a good balance of hardness and toughness.

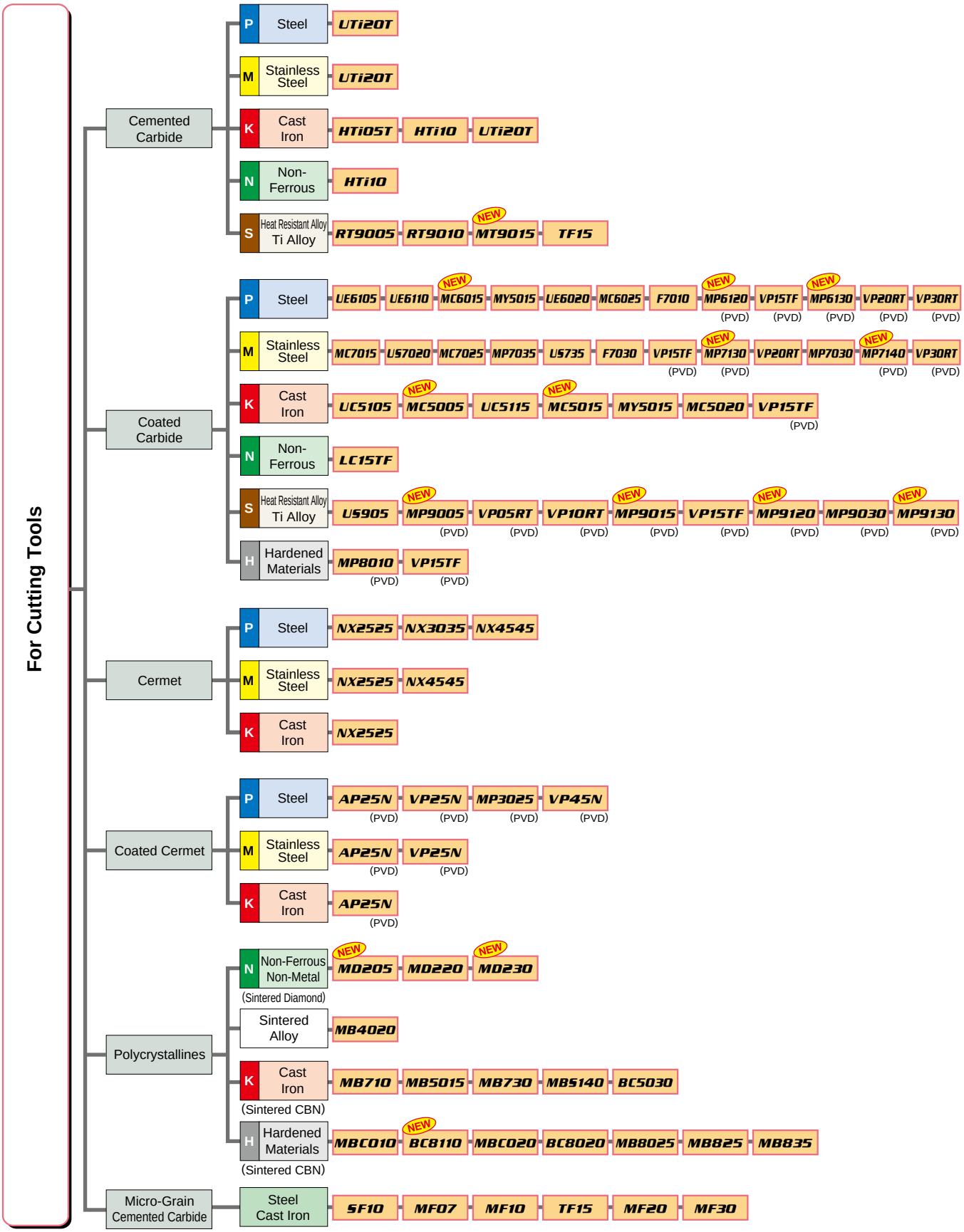


GRADE CHARACTERISTICS

Hard Materials	Hardness (HV)	Energy Formation (kcal/g · atom)	Solubility in Iron (%.1250℃)	Thermal＊ Conductivity (W/m·k)	Thermal Expansion (x 10^{-6}/k)	Tool Material
Diamond	>9000	–	Highly Soluble	2100	3.1	Sintered Diamond
CBN	>4500	–	–	1300	4.7	Sintered CBN
Si_3N_4	1600	–	–	100	3.4	Ceramics
Al_2O_3	2100	-100	≒0	29	7.8	Ceramics Cemented Carbide
TiC	3200	-35	< 0.5	21	7.4	Cermet Coated Carbide
TiN	2500	-50	–	29	9.4	Cermet Coated Carbide
TaC	1800	-40	0.5	21	6.3	Cemented Carbide
WC	2100	-10	7	121	5.2	Cemented Carbide

＊ 1W/m • K=2.39×10^{-3}cal/cm • sec • ℃

GRADE CHAIN


For Cutting Tools
Cemented Carbide
P Steel
UTi20T
M Stainless Steel
UTi20T
K Cast Iron
HTi05T
HTi10
UTi20T
N Non-Ferrous
HTi10
S Heat Resistant Alloy Ti Alloy
RT9005
RT9010
NEW MT9015
TF15
Coated Carbide
P Steel
UE6105
UE6110
NEW MC6015
MY5015
UE6020
MC6025
F7010
NEW MP6120 (PVD)
VP15TF (PVD)
NEW MP6130 (PVD)
VP20RT (PVD)
VP30RT (PVD)
M Stainless Steel
MC7015
US7020
MC7025
MP7035
US735
F7030
VP15TF (PVD)
NEW MP7130 (PVD)
VP20RT
MP7030
NEW MP7140 (PVD)
VP30RT (PVD)
K Cast Iron
UC5105
NEW MC5005
UC5115
NEW MC5015
MY5015
MC5020
VP15TF (PVD)
N Non-Ferrous
LC15TF
S Heat Resistant Alloy Ti Alloy
US905
NEW MP9005 (PVD)
VP05RT (PVD)
VP10RT (PVD)
NEW MP9015 (PVD)
VP15TF (PVD)
NEW MP9120 (PVD)
MP9030 (PVD)
NEW MP9130 (PVD)
H Hardened Materials
MP8010 (PVD)
VP15TF (PVD)
Cermet
P Steel
NX2525
NX3035
NX4545
M Stainless Steel
NX2525
NX4545
K Cast Iron
NX2525
Coated Cermet
P Steel
AP25N (PVD)
VP25N (PVD)
MP3025 (PVD)
VP45N (PVD)
M Stainless Steel
AP25N (PVD)
VP25N (PVD)
K Cast Iron
AP25N (PVD)
Polycrystallines
N Non-Ferrous Non-Metal
NEW MD205
MD220
NEW MD230
(Sintered Diamond)
Sintered Alloy
MB4020
K Cast Iron
MB710
MB5015
MB730
MB5140
BC5030
(Sintered CBN)
H Hardened Materials
MBC010
NEW BC8110
MBC020
BC8020
MB8025
MB825
MB835
(Sintered CBN)
Micro-Grain Cemented Carbide
Steel Cast Iron
SF10
MF07
MF10
TF15
MF20
MF30

GRADE COMPARISON TABLE

CEMENTED CARBIDE

	ISO Classification	ISO Symbol	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Iscar	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
Turning	P	P01										
		P10					IC70	ST10P	TX10S			P10
		P20	UTi20T		SMA		IC70 IC50M	ST20E	UX30			P20
		P30	UTi20T		SM30		IC50M IC54	A30	UX30	PW30		P30
		P40					IC54	ST40E				P40
	M	M10		KU10 K313 K68	H10A	890	IC07	EH510 U10E				M10
		M20	UTi20T	KU10 K313 K68	H13A	HX	IC07 IC08 IC20	EH520 U2	UX30			M20
		M30	UTi20T		H10F SM30	883	IC08 IC20 IC28	A30	UX30			
		M40					IC28					M40
	K	K01	HTi05T	KU10 K313 K68				H1 H2	TH03 KS05F			UF1
		K10	HTi10	KU10 K313 K68	H10 HM	890	IC20	EH10 EH510	TH10	KW10 GW15		K10
		K20	UTi20T	KU10 K313 K68	H13A	HX	IC20	G10E EH20 EH520	KS15F KS20	GW25		K20
		K30	UTi20T			883		G10E				K30
	N	N01			H10 H13A			H1 H2	KS05F	KW10		
		N10	HTi10	KU10 K313 K68		H15	IC08 IC20	EH10 EH510	TH10	KW10 GW15	WK1	
		N20		KU10 K313 K68		HX	IC08 IC20	G10E EH20 EH520	KS15F			
		N30				H25						
	S	S01	RT9005							SW05		
		S10	RT9005 RT9010 MT9015	K10 K313 K68	H10 H10A H10F H13A	HX	IC07 IC08	EH10 EH510	KS05F TH10	SW10	WS10 WK1	
		S20	RT9010 TF15	K10 K313 K68		H25	IC07 IC08	EH20 EH520	KS15F KS20	SW25		
		S30	TF15									
Milling	P	P10										
		P20	UTi20T	K125M			IC50M IC28	A30N	UX30			IN40P
		P30	UTi20T	GX			IC50M IC28	A30N	UX30	PW30		IN40P
		P40					IC28			PW30		
	M	M10										
		M20	UTi20T				IC08 IC20	A30N	UX30			IM30M
		M30	UTi20T		SM30		IC08 IC28	A30N	UX30			IM30M
		M40					IC28					IM30M
	K	K01	HTi05T	K115M,K313								
		K10	HTi10	K115M K313			IC20	G10E	TH10	KW10 GW25	WK10	IN05S
		K20	UTi20T		H13A	HX	IC20	G10E	KS20	GW25	WMG40	IN05S IN30M IN10K IN15K
		K30	UTi20T								WMG40	IN10K IN15K IN30M

(Note) The above table is selected from a publication. We have not obtained approval from each company.

MICRO GRAIN

	ISO Classification	ISO Symbol	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
Cutting Tools	Z	Z01	SF10 MF07 MF10		PN90 6UF,H3F 8UF,H6F		F0	F MD05F MD1508			IN05S
		Z10	HTi10 MF20		H10F	890	XF1 F1 AFU	MD10 MD0508 MD07F	FW30		IN05S
		Z20	TF15 MF30		H15F	890 883	AF0 SF2 AF1				IN05S
		Z30				883	A1 CC				

CERMET

	ISO Classification	ISO Symbol	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Iscar	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
Turning	P	P01	AP25N* VP25N*				IC20N IC520N*	T110A T1000A	NS520 AT520* GT520* GT720*	TN30 PV30* TN6010 PV7010*		CT3000 PV3010* PV3030* IN0560*
		P10	NX2525 AP25N* VP25N*	KT315 KT125	CT5015 GC1525*	TP1020 TP1030* CM CMP*	IC20N IC520N* IC530N*	T1200A T2000Z* T1500A T1500Z*	NS520 NS730 GT730* NS9530 GT9530	TN60 PV60* TN6010 PV7010*	WCE10	CT3000 PV3010* PV3030* IN60C
		P20	NX2525 AP25N* VP25N* NX3035 MP3025*	KT325 KT1120 KT5020*	GC1525*	TP1020 TP1030*	IC20N IC520N* IC30N IC530N* IC75T	T1200A T2000Z* T3000Z* T1500A T1500Z*	NS530 NS730 GT730* NS9530 GT9530	TN60 PV60* TN6020 PV7020* PV7025*	WCE10	
		P30	MP3025 VP45N*				IC75T	T3000Z*		PV7025* PV90*		
	M	M10	NX2525 AP25N* VP25N*	KT125	GC1525*	TP1020 TP1030* CM CMP*		T110A T1000A T2000Z* T1500Z*	NS520 AT530* GT530* GT720*	TN60 PV60* TN6020 PV7020*		IN0560*
		M20	NX2525 AP25N* VP25N*					T1200A T2000Z* T1500A T1500Z*	NS530 GT730* NS730	TN90 TN6020 PV90* PV7020* PV7025*		
		M30										
	K	K01	NX2525 AP25N*					T110A T1000A T2000Z* T1500Z*	NS710 NS520 AT520* GT520* GT720*	TN30 PV30* PV7005* TN6010 PV7010*		
		K10	NX2525 AP25N*	KT325 KT125	CT5015			T1200A T2000Z* T1500A T1500Z*	NS520 GT730* NS730	TN60 PV60* TN6020 PV7020* PV7025*		
		K20	NX2525 AP25N*					T3000Z*				
Milling	P	P10	NX2525			C15M	IC30N			TN60		
		P20	NX2525	KT530M HT7 KT605M	CT530	C15M MP1020	IC30N	T250A	NS530	TN100M TN60		
		P30	NX4545				IC30N	T250A T4500A	NS530 NS540 NS740			CT5000 IN2060*
	M	M10	NX2525				IC30N			TN60		
		M20	NX2525	KT530M HT7 KT605M	CT530	C15M	IC30N		NS530	TN100M		
		M30	NX4545					T250A	NS540 NS740			
	K	K01										
		K10	NX2525						NS530	TN60		
		K20	NX2525	KT530M HT7								

* Coated Cermet

(Note) The above table is selected from a publication. We have not obtained approval from each company.

GRADE COMPARISON TABLE

CVD COATED GRADE

	ISO Classification	ISO Symbol	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Iscar	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
Turning	P	P01	UE6105	KCP05 KC9105	GC4205 GC4005	TP0500 TP1500	IC9150 IC8150 IC428	AC810P AC700G	T9105 T9005	CA510 CA5505	WPP01	TT1500
		P10	UE6105 MC6015 UE6110 MY5015	KCP10B KCP10 KCP25 KC9110	GC4315 GC4215 GC4015 GC4325	TP1500 TP2500	IC9150 IC9015 IC8150 IC8250	AC810P AC700G AC820P AC2000	T9105 T9005 T9115	CA510 CA5505 CA515 CA5515	WPP01 WPP05	TT1500
		P20	MC6015 UE6110 MC6025 UE6020 MY5015	KCP25B KCP25 KC9125	GC4315 GC4215 GC4015 GC4325 GC4225 GC4025	TP2500	IC9015 IC8250 IC9025 IC9250 IC8350	AC820P AC2000 AC830P	T9115 T9125	CA515 CA5515 CA525 CA5525 CR9025	WPP10S WPP20S	TT3500
		P30	MC6025 UE6020 UE6035 UH6400	KCP30 KCP40 KC8050	GC4325 GC4225 GC4025 GC4235 GC4035	TP3500 TP3000	IC8350 IC9250 IC9350	AC830P AC630M	T9125 T9135 T9035	CA525 CA5525 CA530 CA5535 CR9025	WPP30S	TT5100 KT450
		P40	UE6035 UH6400	KCP30 KCP40 KC9140 KC9040 KC9240 KC9245	GC4235 GC4035	TP3500 TP3000	IC9350	AC630M	T9135 T9035	CA530 CA5535		KT450
	M	M10	MC7015 US7020	KCM15	GC2015	TM2000	IC9250 IC6015 IC8250	AC610M	T9115	CA6515	WAM20	
		M20	MC7015 US7020 MC7025	KCM15 KC9225	GC2015	TM2000	IC9250 IC6015 IC9025 IC656	AC610M AC6030M AC630M	T6020 T9125	CA6515 CA6525		TT5100
		M30	MC7025 US735	KCM25 KC9230	GC2025	TM4000	IC9350 IC6025 IC635	AC6030M AC630M	T6030	CA6525		
		M40	US735	KCM35 KC9240 KC9245	GC2025	TM4000	IC6025 IC9350	AC6030M AC630M				
	K	K01	MC5005 UC5105	KCK05	GC3205 GC3210	TH1500 TK1001 TK1000	IC5005 IC9007	AC405K AC410K	T5105	CA4505 CA4010	WAK10	
		K10	MC5015 UC5115 MY5015	KCK15B KCK15 KCK20 KC9315	GC3205 GC3210 GC3215	TK1001 TK1000 TK2000 TK2001	IC5005 IC5010 IC9150 IC428 IC4028	AC405K AC410K AC415K AC420K AC700G	T5115	CA4515 CA4010 CA4115	WAK20	TT1300 TT1500
		K20	MC5015 UC5115 UE6110 MY5015	KCK20 KC9110 KC9325	GC3215	TK2001 TK2000	IC5010 IC8150 IC9150 IC9015 IC418	AC415K AC420K AC700G AC820P	T5115 T5125	CA4515 CA4115 CA4120	WAK30	
		K30	UE6110	KC9125 KC9325			IC9015 IC418	AC820P	T5125			
	S	S01	US905		S05F					CA6515 CA6525 CA6535		
Milling	P	P10				MP1500	IC9080 IC4100 IC9015				WKP25	IN6515
		P20	F7030		GC4220	MP1500 MP2500	IC5100 IC520M	ACP100	T3130		WKP35	IN6530
		P30	F7030	KCPK30 KC930M	GC4230	MP2500	IC4050	ACP100	T3130			
		P40		KC935M KC530M	GC4240							
	M	M10					IC9250					
		M20	F7030	KC925M		MP2500	IC520M IC9350	ACP100	T3130	CA6535		IN6530
		M30	F7030	KC930M	GC2040	MP2500	IC9350 IC4050	ACP100	T3130	CA6535		
		M40		KC930M KC935M			IC635					
	K	K01										
		K10	MC5020					ACK100	T1115 T1015		WAK15	
		K20	MC5020	KC915M	GC3220 GC3330 K20W	MK1500 MK2000	IC5100 IC9150	ACK200	T1115 T1015		WKP25	IN6515
		K30		KC920M KC925M KCPK30 KC930M KC935M	GC3330 GC3040	MK2000 MK3000	IC4100 IC4050 IC520M				WKP35	IN6530

(Note) The above table is selected from a publication. We have not obtained approval from each company.

PVD COATED GRADE

	ISO Classification	ISO Symbol	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Iscar	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
Turning	P	P01								PR915 PR1005		
		P10	VP10MF	KC5010 KC5510 KU10T	GC1525 GC1025	CP200 TS2000	IC250 IC350 IC507 IC570 IC807 IC907 IC908		AH710	PR915 PR1005 PR930 PR1025 PR1115 PR1225 PR1425		
		P20	VP10RT VP20RT VP15TF VP20MF	KC5025 KC5525 KC7215 KC7315 KU25T	GC1525 GC1025 GC1125	CP250 TS2500	IC228 IC250 IC308 IC328 IC350 IC354 IC507 IC528 IC570 IC807 IC808 IC907 IC908 IC928 IC1008 IC1028 IC3028	AC520U	AH710 AH725 AH120 SH730 GH730 GH130	PR930 PR1025 PR1115 PR1225		
		P30	VP10RT VP20RT VP15TF VP20MF	KC7015 KC7020 KU25T KC7235	GC1025 GC1125	CP500	IC228 IC250 IC328 IC330 IC354 IC528 IC1008 IC1028 IC3028	AC530U	AH725 AH120 SH730 GH730 GH130 AH740 J740			TT7220
		P40		KC7040 KC7140 KC7030		CP500	IC228 IC328 IC330 IC528 IC1008 IC1028 IC3028	AC530U	AH740 J740			TT8020
	M	M01										
		M10	VP10MF	KC5010 KC5510 KC6005 KC6015	GC1005 GC1025 GC1125 GC1105	CP200 TS2000	IC330 IC354 IC507 IC520 IC570 IC807 IC907 IC3028		AH710	PR915 PR1025 PR1225 PR1425	WSM20	
		M20	VP10RT VP20RT VP15TF VP20MF	KC5025 KC5525 KC7020 KC7025	GC1005 GC1025 GC1125 GC1105	CP250 TS2500 CP500	IC250 IC330 IC354 IC808 IC908 IC1008 IC1028 IC3028	AC520U	AH710 AH725 AH120 SH730 GH730 GH130 GH330 AH630	PR1025 PR1125 PR1225 PR915 PR930	WSM30	TT5030
		M30	VP10RT VP20RT VP15TF VP20MF MP7035	KC7030 KC7225	GC1125 GC2035	CP500	IC228 IC250 IC328 IC330 IC1008 IC1028 IC3028	AC520U AC530U	GH330 AH725 AH120 SH730 GH730 GH130 J740 AH645	PR1125		TT8020
		M40	MP7035		GC2035		IC328 IC928 IC1008 IC1028 IC3028	AC530U	J740			
	K	K01										
		K10		KC5010 KC7210		CP200 TS2000	IC350 IC1008	AC510U	GH110 AH110 AH710	PR905		
		K20	VP10RT VP20RT VP15TF	KC7015 KC7215 KC7315		CP200 CP250 TS2000 TS2500	IC228 IC350 IC808 IC908 IC1008		GH110 AH110 AH710 AH725 AH120 GH730 GH130	PR905		
		K30	VP10RT VP20RT VP15TF	KC7225		CP500	IC228 IC350 IC808 IC908 IC1008		AH725 AH120 GH730 GH130			
	S	S01	MP9005 VP05RT				IC507 IC907		AH905		WSM10	
		S10	MP9005 MP9015 VP10RT	KC5010 KC5410 KC5510	GC1105 GC1005 GC1025	CP200 CP250 TS2000 TS2500	IC507 IC903	AC510U	AH905 SH730 AH110 AH120		WSM20	
		S20	MP9015 MT9015 VP20RT	KC5025 KC5525	GC1025 GC1125	CP250 TS2500 CP500	IC300 IC808 IC908 IC928 IC3028 IC806	AC510U AC520U	AH120 AH725	PR1125	WSM30	
		S30	VP15TF		GC1125			AC520U	AH725	PR1125		TT8020
Milling	P	P01										
		P10		KC715M	GC1010 GC1025		IC250 IC350 IC808 IC810 IC900 IC903 IC908 IC910 IC950	ACP200		PR730 PR830 PR1025 PR1225		
		P20	MP6120 VP15TF	KC522M KC525M	GC1025 GC1010 GC2030	F25M MP3000	IC250 IC300 IC328 IC330 IC350 IC528 IC808 IC810 IC830 IC900 IC908 IC910 IC928 IC950 IC1008	ACP200	AH725 AH120 GH330 AH330	PR730 PR830 PR1025 PR1225 PR1230 PR1525		IN2004

(Note) The above table is selected from a publication. We have not obtained approval from each company.

GRADE COMPARISON TABLE

PVD COATED GRADE

	ISO Classification	ISO Symbol	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Iscar	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
Milling	P	P30	MP6120 VP15TF MP6130 VP30RT	KC725M KC530M	GC1010 GC1030 GC2030	F25M MP3000 F30M	IC250 IC300 IC328 IC330 IC350 IC528 IC830 IC900 IC928 IC950 IC1008	ACP200 ACP300	AH725 AH120 AH130 AH140 GH130 AH730	PR660 PR1230	WSP45	IN1040 IN1540 IN2040
		P40	VP30RT	KC735M	GC1030	F40M T60M		ACP300	AH140			
	M	M01										
		M10		KC715M	GC1025 GC1030		IC903			PR730 PR1025 PR1225	WSM35	
		M20	VP15TF MP7130 MP7030 VP20RT	KC730 KC522M KC525M	GC1025 GC1030 GC1040 GC2030	F25M MP3000	IC250 IC300 IC808 IC830 IC900 IC908 IC928 IC1008	ACP200	AH725 AH120 GH330 AH330 GH110	PR730 PR660 PR1025 PR1225	WSP45	
		M30	VP15TF MP7130 MP7030 VP20RT MP7140 VP30RT	KC725M KC735M	GC1040 GC2030	F30M F40M MP3000	IC250 IC300 IC328 IC330 IC830 IC928 IC1008	ACP200 ACP300	AH120 AH725 AH130 AH140 GH130 AH730 GH340	PR660 PR1510	WXM35	IN1515 IN1530 IN2005 IN2505
		M40	MP7140 VP30RT			F40M		ACP300	AH140			
	K	K01	MP8010						AH110 GH110 AH330			
		K10	MP8010	KC510M	GC1010		IC350 IC810 IC830 IC900 IC910 IC928 IC950 IC1008		AH110 GH110 AH725 AH120 GH130 AH330	PR1210 PR905		
		K20	VP15TF VP20RT	KC520M KC525M	GC1010 GC1020	MK2000	IC350 IC808 IC810 IC830 IC900 IC908 IC910 IC928 IC950 IC1008	ACK300	GH130	PR1210 PR905		IN1030 IN2010 IN2015
		K30	VP15TF VP20RT	KC725M KC735M	GC1020		IC350 IC808 IC830 IC908 IC928 IC950 IC1008	ACK300				IN1510 IN2030
	S	S01								PR905		
		S10	MP9120 VP15TF	KC510M	C1025		IC903	EH520Z EH20Z		PR905		
		S20	MP9120 VP15TF MP9130 MP9030	KC522M KC525M	GC1025 GC2030 S30T		IC300 IC908 IC808 IC900 IC830 IC928 IC328 IC330	EH520Z EH20Z ACK300 ACP300		PR905	WXM35 WSM35	
		S30		KC725M	GC2030	F40M	IC830 IC928	ACP300				
	H	H01	MP8010 VP05HT				IC903				WXH15	
		H10	VP15TF VP10H	KC635M	GC1010 GC1030	MH1000 F15M	IC900					
		H20	VP15TF	KC635M	GC1010 GC1030	F15M	IC900 IC808 IC908 IC1008					
		H30		KC530M		MP3000 F30M	IC808 IC908 IC1008					

(Note) The above table is selected from a publication. We have not obtained approval from each company.

CBN

	ISO Classification	ISO Symbol	Mitsubishi Materials	Sandvik	Seco Tools	Sumitomo Electric	Tungaloy	Kyocera	Dijet
Turning	H	H01	BC8110 MBC010 MB810		CBN060K	BNC100 BNX10 BN1000	BXM10 BX310	KBN050M KBN10M KBN510	
		H10	BC8110 MBC020 BC8020 MB825 MB8025	CB7015	CBN010	BNC160 BNX20 BN2000	BXM20 BX330	KBN25M KBN525	JBN300
		H20	MBC020 BC8020 MB8025	CB7025 CB20	CBN150 CBN160C	BNC200 BNX25 BN250	BXM20 BX360	KBN30M	JBN245
		H30	BC8020 MB835	CB7525	CBN150 CBN160C	BNC300 BN350	BXC50 BX380	KBN35M	
	S	S01	MB730		CBN170	BN700 BN7000	BX950		
		S10							
		S20							
		S30							
	K	K01	MB710 MB5015			BN500 BNC500	BX930 BX910		
		K10	MB730 MB4020	CB7525		BN700 BN7500 BN7000	BX850	KBN60M	JBN795
		K20	MB730 MB4020		CBN200	BN700 BN7000	BX950	KBN60M	JBN500
		K30	BC5030 MBS140	CB7925	CBN300 CBN400C CBN500	BNS800	BX90S BXC90	KBN900	
	Sintered Alloy		MB4020 MB835		CBN200	BN7500 BN7000	BX450 BX470 BX480	KBN65B KBN570 KBN65M KBN70M	

PCD

	ISO Classification	ISO Symbol	Mitsubishi Materials	Sandvik	Seco Tools	Sumitomo Electric	Tungaloy	Kyocera	Dijet
Turning	N	N01	MD205	CD05	PCD05	DA90	DX180 DX160	KPD001	JDA30 JDA735
		N10	MD220	CD10	PCD10	DA150	DX140	KPD010	
		N20	MD220		PCD20	DA2200	DX120		JDA715
		N30	MD230		PCD30 PCD30M	DA1000	DX110	KPD230	JDA10

(Note) The above table is selected from a publication. We have not obtained approval from each company.

INSERT CHIP BREAKER COMPARISION TABLE

NEGATIVE INSERT TYPE

ISO Classification	Cutting Mode	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Taegu Tec	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
P	Finish	PK* FH FY	FF	QF LC	FF1, FF2	FA	FA FL	01* TF ZF	DP* GP, PP XP, XP-T, XF	FP5	FA
	Light	LP C SA, SH	LF*, FN	XF PF	MF2	FG	SU LU SX, SE	NS, 27 TSF, AS	PQ HQ, CQ	MP3 NF3, NF4	FG
	Light (Mild Steel)	SY				FC		17	XQ, XS		
	Light (With Wiper)	SW	FW	WL, WF	W-MF2	WS	LUW, SEW	AFW, ASW	WP, WQ	NF	WS
	Medium	MP MA MH	P MN	PM QM, XM	MF3 MF5, M3 M5	PC, MP MT SM	GU UG GE, UX	NM, ZM TM DM, 33, 37, 38	PG, CJ, GS PS, HS PT	MP5	MC MP MT
	Medium (With Wiper)	MW	MW, RW	WMX, WM	M6, W-M3 W-MF5	WT	GUW			NM	WT
	Rough	RP GH Std.	RN, RP	PR, HM XMR	MR6, MR7	RT	MU, MX, ME UZ	TH Std.	PH GT Std.	RP5 NM6, NM9	RT Std.
	Heavy	HZ HX HV	MR RM RH	QR, PR HR, MR	R4, R5, R6 57, RR6, R7 R8, RR9	RX, RH HD, HY, HT HZ	MP HG, HP HU, HW, HF	THS TU TUS	PX	NR6, NRF NRR	RH
M	Finish Light	SH, LM	FP LF*	MF	MF1	SF	SU	SS	MQ, GU	NF4	SF
	Medium	MS, GM MM, MA ES	MP	MM QM K	MF4	ML EM VF	EX, UP GU HM	SA, SF SM S	MS, MU SU, HU, TK ST	NM4	ML MP MT VF
	Heavy	GH, RM HZ	UP, RP	MR MR	M5, MR7 RR6		MU MP	TH, SH		NR4, NR5	RH
K	Finish Light	LK, MA	FN	KF	MF2, MF5, M3, M4			CF	Std.	MK5	
	Medium	MK, GK Std.	RP,UM	KM	M5		UZ, GZ, UX	CM Std.	C	RK5, NM5	Std.
	Rough	RK		KR					PH, GC	RK7	
	Heavy	Flat Top	Flat Top		MR3, MR4, MR7 Flat Top		Flat Top	CH, Flat Top	ZS, Flat Top	Flat Top	
S	Finish	FJ*	FS, LF*	SF	MF1		EF		MQ		
	Light	LS	MS	SGF*	MF4, MF5	EA	SU*			NF4, NFT	
	Medium	MS	UP, P, NGP*	NGP*, SM	M1		EG, EX, UP	SA, HMM	MS, MU, TK	NMS, NMT	
	Heavy	RS, GJ	RP	SR, SMR	M5, MR3, MR4	ET	MU			NRS, NRT	

* Peripheral ground type insert.

(Note) Above charts are based on published data and not authorized by each manufacturer.

7° POSITIVE INSERT TYPE

ISO Classification	Cutting Mode	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Taegu Tec	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
P	Finish	SMG*	LF*	UM*			FC*, SC*	JS*, 01*	CF*, CK* GQ*, GF*		
	Finish Light	FP, FV LP, SV	UF,11 LF, FP	PF, UF	FF1 F1	FA FG	FP, LU SU	PF, PSF PS, PSS	GP XP	PF4	FA FG
	Light (With Wiper)	SW	FW	WF	W-F1	WS	LUW				
	Medium	MV MP, Std.	MF, MP	PM, UM	F2, MF2, M5	PC MT	MU	23 PM, 24	HQ XQ, GK	PS5 PM5	MT
	Medium (With Wiper)	MW	MW	WM	W-F2	WT				PM	WT
M	Finish—Light	FM LM	LF, UF FP	MF	F1, F2		FC* LU SU	PF, PSF PS, PSS	CF*,CK* GQ*,GF* MQ		
	Medium	MM Std.	MP	MM			MU	PM	HQ, GK		
K	Medium	MK, Std., Flat Top	Flat Top	KF, KM, KR	F1, M3, M5		MU, Flat Top	Flat Top, CM	Flat Top*		
N	Medium	AZ*	HP*	AL*	AL*	SA* FL*	AG*	AL*	AH*	PM2*	FL*
S	Finish Light	FJ*	LF* HP*						MQ		

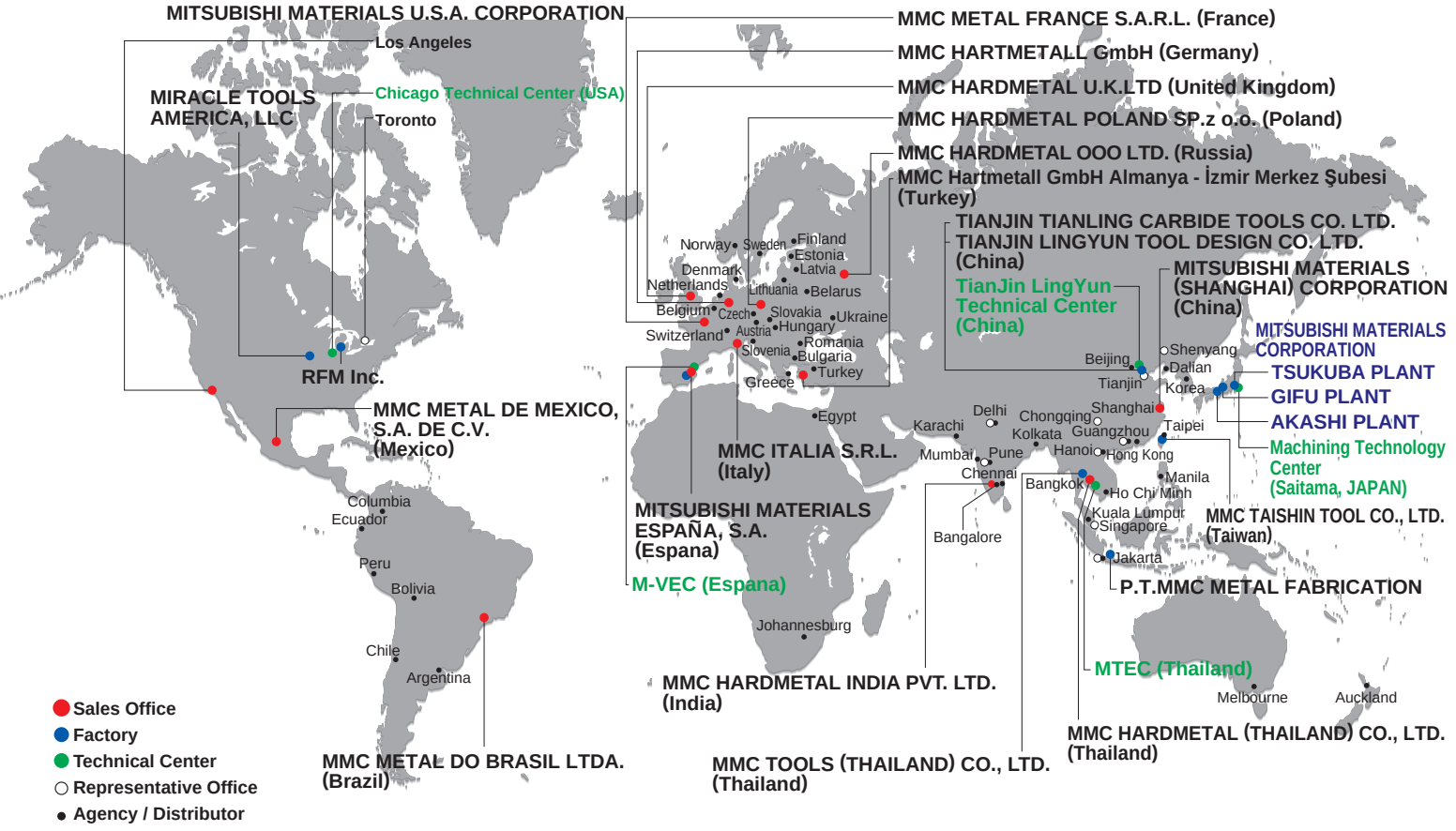
* Peripheral ground type insert.
(Note) Above charts are based on published data and not authorized by each manufacturer.

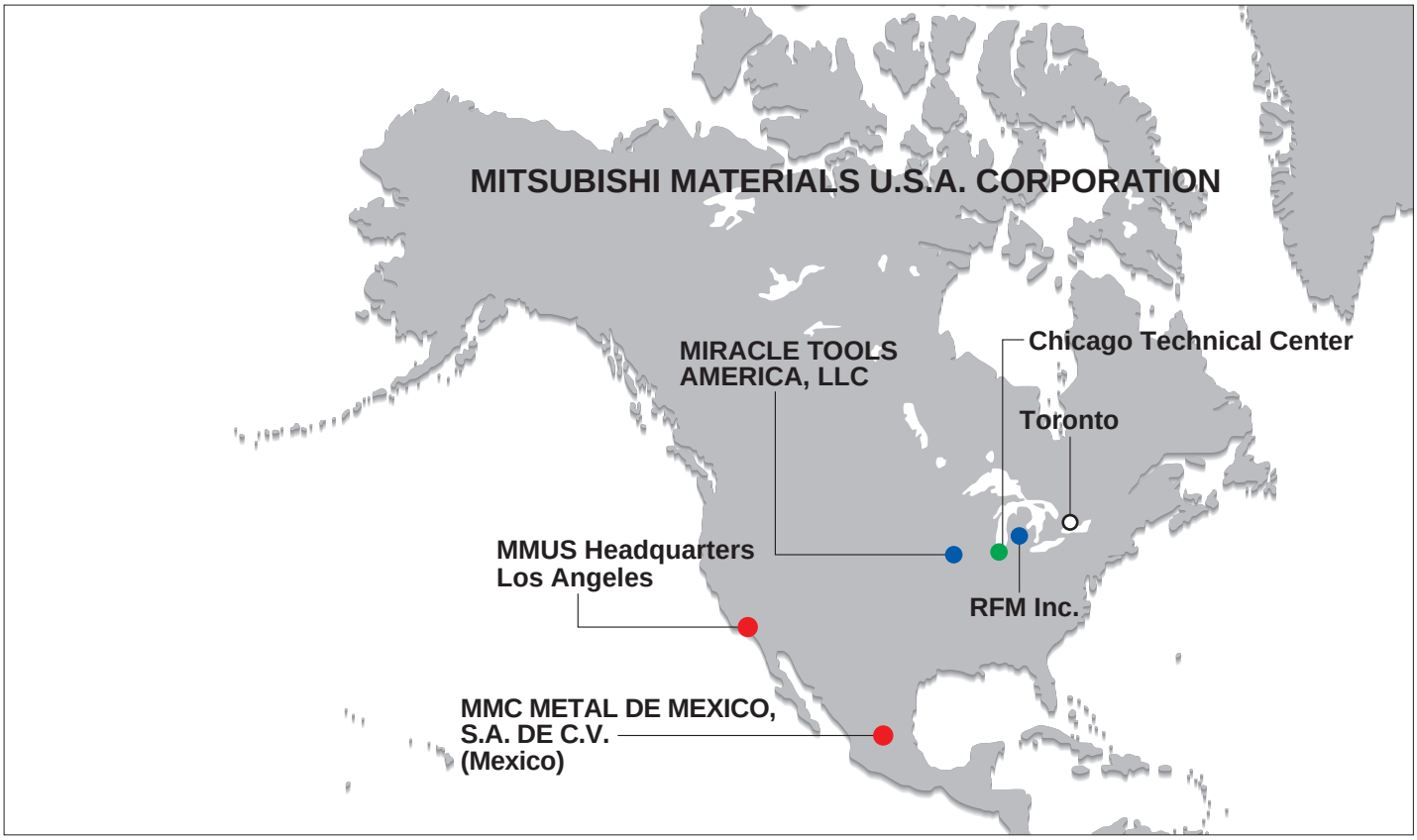
11° POSITIVE INSERT TYPE

ISO Classification	Cutting Mode	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Taegu Tec	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
P	Finish Light	FV, SMG* SV	UF LF	PF			SI LU SU	01* PF, PSF PS, PSS	GP, CF* XP		
	Medium	MV	MF	PM, UM			MU	PM 23 24	HQ XQ		
M	Finish—Light	SV		MF			SU	PF, PS	GP, CF*		
	Medium	MV		MM			MU	PM	HQ		

* Peripheral ground type insert.
(Note) Above charts are based on published data and not authorized by each manufacturer.

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The Scope of the Registration:
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The Scope of the Registration:
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